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**Towards inclusive health systems in low- and middle-income countries:
assessment of current and potential coverage of physical and functional
rehabilitation care for people with disabilities**

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« On peut tout ce qui ne dépend que de notre volonté ».

Marcel Proust

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A mes Grands-pères,

Abstract

Access to rehabilitation care is one of the most important health strategies in line with promotion, prevention, treatment, and palliative care within the international community. This thesis fits into the economic literature on the inclusion of rehabilitation care in low- and middle-income countries (LMICs). The aim is to provide an assessment of current and potential coverage of physical and functional rehabilitation care for persons with disabilities with the final objective to contribute to more inclusive health systems in LMICs for the most vulnerable people. The chapter 1 is a situational analysis of physical and functional rehabilitation in LMICs. The second chapter focuses on the analysis of rehabilitation in Cambodia, while the third one provides some inputs from Rwanda's perspective. These two countries have been studied to concretely understand how physical and functional rehabilitation services are financed, managed and covered by state and non-state actors. Overall, the thesis underlined that every country has a different starting point for the inclusion of rehabilitation in the universal health coverage (UHC). The aim for all LMICs, committed to the UHC, is to make access to quality, affordable health and rehabilitation care a reality for all people. However, the process to reach this objective is difficult to answer for most countries, but certain pathways can ensure success.

Key words: Cambodia; governance; health financing; health systems; inclusion; low- and middle-income countries; persons with disabilities; rehabilitation; Rwanda; social protection; sustainable development goals; universal health coverage.

JEL codes: I13; I14; I15; I18.

Résumé

L'accès aux soins de réadaptation est l'une des stratégies de santé les plus importantes en matière de promotion, de prévention, de traitement et de soins palliatifs au sein de la communauté internationale. Cette thèse s'inscrit dans la littérature économique sur l'inclusion des soins de réadaptation dans les pays à revenu faible et intermédiaire (PRFI). L'objectif est de fournir une évaluation de la couverture actuelle et potentielle des soins de réadaptation physique et fonctionnelle pour les personnes handicapées avec comme objectif final de contribuer à des systèmes de santé plus inclusifs dans les PRFI pour les personnes les plus vulnérables. Le chapitre 1 est une analyse situationnelle de la réadaptation physique et fonctionnelle dans les PRFI. Le deuxième chapitre se concentre sur l'analyse de la réadaptation au Cambodge, tandis que le troisième chapitre fournit ces informations selon la perspective du Rwanda. Ces deux pays ont été étudiés pour comprendre concrètement comment les services de réadaptation physique et fonctionnelle sont financés, gérés et couverts par les acteurs étatiques et non étatiques de ces pays. Dans l'ensemble, la thèse a montré que chaque pays a un point de départ différent pour l'inclusion de la réadaptation dans la couverture santé universelle (CSU). L'objectif pour tous ces pays, engagés vers la CSU, est de permettre un accès à des soins de santé et de réadaptation de qualité et abordables, et d'en faire une réalité pour tous. Cependant, la mise en place d'une stratégie de réponse permettant d'atteindre cet objectif est complexe pour la plupart des pays, même si certaines voies peuvent mener au succès.

Mots-clés: Cambodge; couverture santé universelle ; financement de la santé; gouvernance; inclusion; objectifs de développement durable ; pays à revenu faible et intermédiaire ; personnes handicapées; protection sociale ; réadaptation; Rwanda; système de santé.

Codes JEL: I13; I14; I15; I18.

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List of Acronyms

ANRT	Association Nationale de la Recherche et de la Technologie
AusAid	Australian Agency for International Development
CBHI	Community Based Health Insurance
CDHS	Cambodia Demographic and Health Survey
CDPO	Cambodia Disabled People Organization
CERDI	Centre d'Etudes et de Recherches sur le Développement International
CIFRE	Conventions Industrielles de Formation par la Recherche
CMAA	Cambodia Mine Action and Victim Assistance Authority
CPA	Complementary Package of Activities
CPTA	Cambodian Physical Therapy Association
CSPO	Cambodian School of Prosthetics and Orthotics
CT	Cambodia Trust
DAC	Disability Action Council
DAH	Development Assistance for Health
DRA	Disability Rights Administration
DRIC	Disability Rights Initiative Cambodia
FOE	Faculty of P&O Engineering
GATE	Global Cooperation on Assistive Technology
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HEF	Health Equity Fund
HI	Humanity & Inclusion
HIB	Handicap International Belgium
HIF	Handicap International France
ICRC	International Committee of the Red Cross
IDPoor	Cambodian Identification of Poor Households Program
iFAR	improve Financial Access to Rehabilitation services
IOs	International organizations
ISPO	International Society for Prosthetics and Orthotics
KHAPO	Khmer Association of Prosthetists and Orthotists
KHR	Cambodia Riel
LMICs	Low and middle income countries
MDG	Millennium Development Goals
MoEF	Ministry of Economy and Finance
MoH	Ministry of health
MoLVT	Ministry of Labor and Vocational Training
MoP	Ministry of Planning
MoSVY	Ministry of Social Affairs, Veterans and Youth Rehabilitation
MoU	Memorandum of Understanding

MPA	Minimum Package of activities
NDCC	National Disability Coordination Committee
NDSP	National Disability Strategic Plan
NGO	Non-governmental organizations
NHA	National Health Account
NISA	National Institute of Social Affairs
NSSF	National Social Security fund
NSSF-CS	National Social Security Fund for Civil Servants
OCF	Orthopedic Component Factory
OOP	Out-of-pocket
P&O	Prosthetic and Orthotic
PGAHI	Postgraduate Allied Health Institute
PO	Prosthetist and Orthotist
PoSVY	Provincial Department of Social Affairs, Veterans and Youth Rehabilitation
PRC	Physical Rehabilitation Center
PRSS	Priority Rehabilitation Service Scheme
PT	Physiotherapy / Physiotherapists
PWDF	Persons with Disabilities Foundation
RGC	Royal Government of Cambodia
SCIC	Spinal Cord Injury Center
SDG	Sustainable Development Goals
SIF	Singapore International Foundation
THE	Total Health Expenditure
UHC	Universal Health Coverage
UHS	University of Health Science
UNCRDP	United Nations Convention on the Rights of Persons with Disabilities
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USD	United States Dollars
UXO	Unexploded ordnance
VIC	Veterans International Cambodia
WB	World Bank
WCPT	World Confederation for Physical Therapy
WHO	World Health Organization

General introduction

The French Ministry of Higher Education, Research and Innovation has entrusted the ANRT (*Association Nationale de la Recherche et de la Technologie*) with the implementation of the CIFRE scholarship. The CIFRE is an industrial convention for training through research (*Convention industrielle de formation par la recherche*) with the objective of promoting the development of public-private partnership research. This thesis is the result of a tripartite collaboration between Humanity & Inclusion (HI), a French non-governmental organization (NGO), the ANRT, and a public research laboratory - the CERDI (*Centre d'Etudes et de Recherches sur le Développement International*). The author has volunteered for six weeks in Laos for HI in aim to conduct a study regarding the financial access to physical and functional rehabilitation care for persons with disabilities in the country. Following this mission, HI offered a three-month fixed-term contract to the author to continue the work on this topic. Convinced of the need for further in-depth research on this emerging issue, the author proposed a partnership to HI involving the CIFRE scholarship in order to provide some new elements of understanding towards the rights of persons with disabilities with the universal health coverage as a backdrop. The NGO had begun research on the issue of financial access to rehabilitation care and was looking for a health economist to pursue the research initiated. Throughout the three-year contract, the author spent half-time working in her research work and half time within Humanity & Inclusion as a technical assistant in health economics.

1. Humanity & Inclusion and physical and functional rehabilitation

As we previously said, this thesis has been done with the financial and logistic support of Humanity & Inclusion (HI), formerly known as “Handicap International”, an independent and impartial French aid organization working in situations of poverty and exclusion, conflict and disaster” (Humanity & Inclusion and Global Rehabilitation Alliance 2019).

HI was founded in 1982 by two French doctors from a feeling of outrage about the injustice faced by victims of conflict in Cambodia. The aim was to provide physical and functional rehabilitation services in Cambodian refugee camps. It has a long and rich history and experience of this issue since its founding. The organization is now implementing physical rehabilitation projects in 40 countries, from community-based services to national referral

centers, training specialized human resources and setting up logistical, management and referral mechanisms to policy support to health and/or social ministries. Based on this experience, Humanity & Inclusion considers that rehabilitation services are a key element to achieve inclusive health; it is an essential component of the continuity of care and of Universal Health Coverage. Since 2011, it has therefore been engaging on advocacy to ensure “greater recognition of rehabilitation services within the global health agenda” (Humanity & Inclusion and al., 2016).

HI works alongside persons with disabilities and vulnerable populations, taking action and bearing witness in order to respond to their essential needs, improve their living conditions and promote respect for their dignity and fundamental rights.

Around 3,278 people work for HI including 2,522 national staff on the ground, 307 international staff on the ground, 246 headquarters staff working for programs and on program monitoring, and 203 staff working in support services, fundraising and communication.

HI recently developed a 2016-2025 strategy composed of three chapters which are divided into 16 areas and 50 opportunities and then in as many projects as necessary. The three chapters are the following: inclusion of persons with disabilities and vulnerable populations, inclusive emergency responses adapted to the needs of the population, and reducing the impact of conflicts on civilians. In this strategy, improved access to rehabilitation care occupies an important place; it represents a cross-cutting activity among the strategy’s fifty opportunities, and one of those opportunities is completely devoted to it. In addition, the HI’s strategy is in line with international recommendations related, in particular, to the sustainable development goals (SDGs).

Rehabilitation field is the core expertise of Humanity & Inclusion that implement 95 rehabilitation projects in 49 countries in 2017. It represents approximately 277,194 people that directly benefit from the actions of HI and its partners within rehabilitation activities. HI works to set up a community support system specific to each individual: community-based rehabilitation aims to teach the patient's family and friends the simple actions that can help them.

The rehabilitation division of HI is involved in the international community and takes part to all high level meeting, movement and alliances in relation to physical and functional

rehabilitation. Within this division, projects and activities focus on physical and functional rehabilitation that includes therapy and assistive products services. It thus excluded sensory-related disability issues or visual and hearing impairments, that are not considered in the organization. Similarly the division is not working on mental health issues that are addressed by the Health division of HI. For instance, HI contribute to the Global Cooperation on Assistive Technology (GATE), the Global Rehabilitation Alliance, the call for action Rehabilitation 2030, and WHO's technical meetings. HI is one of the most recognized actors working in the rehabilitation thematic in low- and middle-income countries.

2. Context of the humanitarian environment

The humanitarian environment is currently undergoing multi-level changes: technological revolution, climate change, radicalization of conflicts, development paradox, effects of globalization, evolution of public funding, and transformation of solidarity actors.

These changes induced some opportunities and threats that require all non-governmental organizations and the civil society to adapt to this new environment. These evolutions have to be taken into account in strategies developed by actors of the rehabilitation sector in low- and middle-income countries. Activities undertaken by these actors should be based on factual decisions in order to always keep a universal and sustainable access to rehabilitation services for the most vulnerable people as ultimate goal.

First, technological evolutions are possible with geolocation or big data. With these technologies, it is possible to locate war residues (mines, munitions, etc.) or to measure the scale and speed of population movements in the event of conflict or disaster, and big data allow new form of sources of funding thanks to social networks. It helps to prevent damages to the population and better manage future possible outbreaks.

A consequence of climate change for the humanitarian sector is the growth of vulnerable people worldwide because of persons displaced by natural disasters. This change threatens food security, access to water, health, education, specialized services, etc. Natural disasters may generate many types of disabilities, and people affected first, and foremost are mostly

living in developing countries. Around 25.3 million of people were displaced by natural disasters from 2008 to 2016 (IDMC 2017).

Over the past years, conflicts have intensified. There is an intensive and increasing use of explosive weapons in densely populated areas that causes the destruction of health care infrastructure. In consequences, the protection of populations and the safety of humanitarian workers is deteriorating, access to resources is difficult and controlled by belligerents (factions, rising terrorism, etc.), and there is an increased risk of displaced persons resulting from conflicts.

Social inequalities are widening, 1.2 billion people live in extreme poverty and 20% of them have a disability. Moreover, cities are growing, it is estimated that by 2025, 1.7 billion people will live in slums, generally in poor conditions (United Nations 2018). The poverty has fallen sharply in twenty years (10% of the world's population lived on less than \$1.90 a day, down from nearly 36% in 1990) but the poverty headcount is increasing in countries affected by fragility, conflict and violence. Experience showed that in countries where poverty has been reduced, economic growth is concentrated in urban areas, which is to the detriment of the poor in rural areas (World Bank 2019).

The development paradox is due to the increase of non-communicable diseases and road accidents, inducing more disability and disabling diseases. Medical advances are leading to longer life expectancy, and consequently increased disability probability. Population ageing is also a global health issue as by 2030, 13% of the population will be over 65 years old. Moreover, 90% of road accidents occur in LMICs, with 20 to 50 million people injured or disabled each year worldwide.

Due to globalization, there is a reinforcement of requirements imposed on countries receiving development aid, which has an impact on non-governmental organizations as they face increasing administrative and control constraints.

Additionally, public funding are moving and focus more on humanitarian aid than official development assistance (ODA). According to Development Initiatives' work, from 2013 to 2017, the humanitarian aid, directed internationally by donors, increased from \$18.4 billion to 27.3 billion, and the humanitarian assistance represented around 20% of the ODA in 2016 (Development initiatives 2018). There is a greater proportion of ODA spent as humanitarian assistance. From 2007, ODA and the humanitarian assistance faced an increasing trend but

the level of humanitarian assistance within ODA is growing faster (+124%) than the ODA (+41%) since 2007. Additionally, this increase of humanitarian assistance has not been compensated by investments of non-humanitarian ODA. Actually, countries that have traditionally invested heavily in aid tend to refocus their budgets on humanitarian aid, to the detriment of development aid, due to the decline in financial resources. Emerging economic have significant public aid budgets, but implemented as a priority within their areas of influence and, sometimes with a different vision of cooperation and partnership. Ensuring sustainable, resilient and inclusive health system that include rehabilitation services is thus challenging in this context of prioritization of humanitarian assistance as long term projects are mostly financed through ODA.

Furthermore, there is a transformation of solidary actors through the diversification of actors and the willingness of donors to reduce the number of solidary actors worldwide. Some organizations from developing countries or emerging economic powers have become important actors. The main donors, favoring the impact of actions, want to work with fewer actors capable of managing and implementing large volumes of activity. Finally, there are new types of actors (think tanks or commercial sectors) that are becoming increasingly involved in development issues and are accessing funding lines that are no longer reserved for NGOs only. Therefore, increasing collaboration and partnerships between NGOs, IOS and these new actors will increase the impact of initiatives and projects for a better inclusion of rehabilitation within health systems of low- and middle-income countries.

3. Disability and rehabilitation worldwide

The study of rehabilitation and disability related issues worldwide requires the use of health economics. This field of research introduces comprehensive understanding of all flows interacting for the provision of rehabilitation services in a country, from macroeconomic to microeconomic analyses.

Within this thesis, we aim to provide an assessment of current and potential coverage of physical and functional rehabilitation care for persons with disabilities with a final objective to contribute to more inclusive health systems in low- and middle-income countries (LMICs) for the most vulnerable people.

3.1. Disability related-rehabilitation

Access to rehabilitation care is one of the most important health strategies in line with promotion, prevention, treatment, and palliative care within international community. The World Health Organization (WHO) and the World Bank estimated that over one billion people, or 15% of the global population, live with physical, sensory, intellectual, or mental health impairment significant enough to affect their daily lives (WHO and World Bank 2011). Moreover, among these 15%, 80% are living in low- and middle-income countries (LMICs), without equal access to health care and rehabilitation, education, and employment, and their community often marginalized or excluded them from any socioeconomic, religious, and political, life. Additionally, people with disabilities have also often been ignored by international community and their development efforts (N. E. Groce 2018).

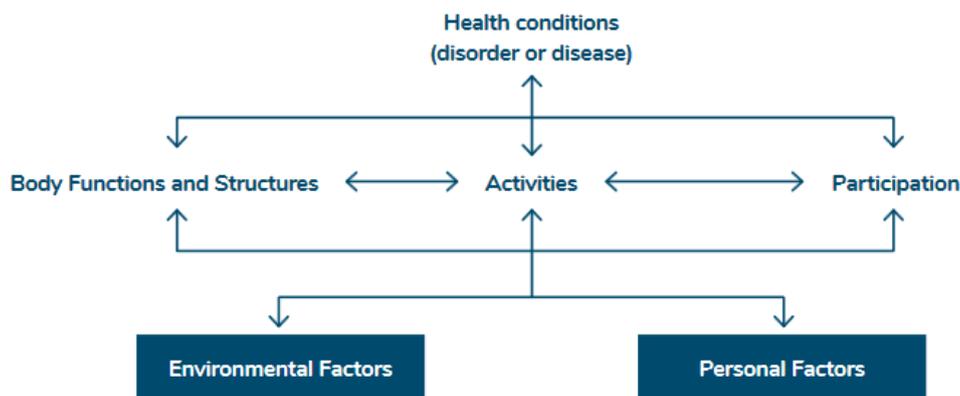
The prevalence of health conditions associated with severe disability has increased by 23% since 2005 and the consequence is a higher demand for rehabilitation services (World Health Organization 2017b). However, these figures are largely used in the literature for rehabilitation and disability, while they do not reflect the real scope of rehabilitation needs. Indeed, most disabilities are not visible and thus they are not correctly addressed and recognized. Persons with disabilities have specific health needs that may require access to rehabilitation services, in addition to general health needs like everyone else, thus they may require from minor and inexpensive interventions to complex and costly-ones. Therefore, people with disabilities have a “double penalty” as they can have higher health expenses compared to people without disabilities and they often belong to the poorest part of the population.

3.2. Key definitions related to disability and rehabilitation

In 2001, WHO developed the International Classification of Functioning, Disability and Health (ICF) in order to provide a unified and standard language and framework for the description of health and health-related states. The ICF is summarized in the figure below. Within this document, WHO defines disability as a set of terms that englobes impairments, activity limitations, and participation restrictions. Body functions are defined as the physiological aspects of body systems and structures as the anatomical support. This model

focuses on the individual’s performance (activities performed as part of everyday life) that determines a causal link between that performance and the person’s social participation (Humanity & Inclusion 2013).

Figure 1: The international classification of functioning, disability and health.



Sources: (Humanity & Inclusion and al. 2016; WHO 2001)

In the Rehabilitation 2030 ‘Call for Action’ document (WHO 2017c) rehabilitation is defined as “a set of interventions designed to reduce disability and optimize functioning in individuals with health conditions in interaction with their environment”. “And, health conditions refer to disease, acute or chronic, disorder, injury or trauma. A health condition may also include other circumstances such as pregnancy, ageing, stress, congenital anomaly or genetic predisposition.”

In this thesis, we studied physical and functional rehabilitation care that comprises the following health services/components: physiotherapy (or physical therapy), occupational therapy, speech therapy, provision of prosthetics, orthotics and technical aids devices.

This choice is justified by the field of intervention of Humanity & Inclusion that have projects on physical and functional rehabilitation services, excluding sensory-related disability issues or visual and hearing impairments. Humanity & Inclusion target the most vulnerable people worldwide, including people with disabilities, and its other areas of intervention involve health and prevention, social and inclusion, protection and risk reduction, emergency, mines action, migration, and advocacy (Humanity & Inclusion 2019).

According to the World Confederation of Physical Therapy, physiotherapy services are provided by physiotherapists to individuals in order to develop, maintain and restore

maximum movement and functional ability throughout their lifespan. This service is provided in circumstances where movement and function are threatened by ageing, injury, pain, diseases, disorders, conditions or environmental factors and with the understanding that functional movement is central to what it means to be healthy (WCPT 2017).

Occupational therapy is defined by the World Federation of Occupational Therapists as services that promote health and well-being through occupation. These services provide access to a broad range of appropriate assistive technologies for those who need them in order to enable people to participate in the activities of everyday life (WFOT 2017).

Regarding how speech therapy services address challenges with language and communication. Speech therapists work with people who have problems with speech, language, thinking, and swallowing and work to prevent, assess, diagnose, and treat speech, language, social communication, cognitive-communication, and swallowing disorders in children and adults (ASHA 2018).

Prostheses and orthoses are externally applied devices and products used to assist people with physical impairments or functional limitations, to improve their functioning and increase their potential to live healthy, productive, independent, dignified lives. A prosthesis is an externally applied device used to replace wholly or partly an absent or deficient limb segment. An orthosis is an externally applied device used to support or modify the structural and functional characteristics of the neuromuscular and skeletal systems. Prostheses and orthoses have various purposes, including the improvement of the mobility, dexterity or functioning of the user; they alleviate pain; restore cosmesis; protect joints; prevent and correct deformities; and prevent secondary impairments (WHO 2017a).

The objectives of rehabilitation are several: optimize functioning and reduce disability in light of the health condition. It does not target disease process or health condition's causes. Rehabilitation is person-oriented. It starts with the person and her/his close environment and ends with the person and her/his close environment (Kleinitz 2018).

Internationally, the provision of health care for people with disabilities represents a significant and largely overlooked challenge. Globally, disability remains a major health and public policy concern for decision makers and health scientists (Brown, 1997; Groce, 2011; Rimmer & Braddock, 2002). The World Report on Disability estimates that about 15% of the world's population has some form of disability and 80% live in developing countries under the

national poverty threshold (WHO, 2011). The World Health Organization (WHO) defines disability as an umbrella term of impairment, activity limitation together with participation restriction or loss of opportunities to take part in the normal life of the community on equal level. The rates of disability are increasing due to wars, conflicts, population ageing and increases in chronic health conditions (WHO, 2001).

People with disabilities constitute one of the most vulnerable and socially marginalized groups in society and are significantly less likely to access health care, education, or employment leading to limited economic participation and poverty, which in turn results in restricted access to adequate housing, food and healthcare (Groce, 2011; Trani & Loeb, 2012). Several empirical studies also highlight a positive relationship between disability and poverty. Trani and Loeb (2012) argue that poverty and disability are interlinked. Poor people with disabilities are caught in a vicious cycle of poverty and disability, each being both a cause and a consequence of the other. Poverty increases the risk of disability and perpetuates the burden of ill-health among individuals of low social economic status (SES) (Groce, 2011).

Multi-country evidence from World Health Survey 2002-04 documenting disparities in disability in 54 countries reveals that disability prevalence is much higher in lower and middle-income countries compared to high-income countries (Mitra & Sambamoorthi, 2014). Other studies measuring inequalities in health and disability found that multiple burdens of ill-health, disability and functional limitations are concentrated among individuals with lower socioeconomic status (Ataguba, 2013; Groce, 2011; Phaswana-Mafuya and al., 2013).

Finally, some authors highlighted that disability is a form of inequality and that disability has close links with health and socio-economic inequalities (Debeaudrap, de Loenzien, and Beninguisse 2019). They argued that the inequality concept refers: (i) to the distribution of people directly or indirectly affected by disability is uneven across regions, social classes, socio-demographic characteristics, economic and political contexts; and (ii) these inequalities in disability status generate health inequalities and, conversely, health inequalities can be a source of disability inequalities. Thus, situations of inequality are interpreted primarily as situations of inequity. In addition, the ideal of equality aims to recognize a difference between individuals according to their disability situation, and it can be achieved through social mobilization. Thus, situations of inequality are interpreted primarily as situations of inequity. This dual dimension, aspiration to equality and recognition of inequity, is characteristic of the disability-inequality relationship. The conception of disability as a socially constructed

process highlights the issue of inequity. Finally, authors concluded that “the promotion of equal opportunities in the context of disability leads to a profound reorganization of society in all its aspects, not only material, economic, institutional, but also political and socio-cultural” (Debeaudrap, de Loenzien, and Beninguisse 2019).

In the *Theory of Justice*, Rawls argued that two conditions are required for justice: the fair distribution of primary goods and the fact that people would choose principles of justice that maximize the minimum level of primary goods (Rawls 1971). Rawls stipulated that primary goods are allocated to individuals on the basis of a “faire equality of opportunity” due to the disadvantages of the “natural lottery” and the “social lottery of life” accumulated by individuals (Venkatapuram 2018). Moreover, Sen defined health equity as a multidimensional concept that includes achievement of health and the capability to achieve good health in addition to the distribution of healthcare (Sen 2002). He added that “the fairness of processes and thus must attach importance to non-discrimination in the delivery of health care”(Sen 2002). Other authors tried to deliver a more specific and “operationalized” definition of health equity that is the absence of disparities in health that are systematically associated with social advantage or disadvantage (Braveman and Gruskin 2003).

4. Methodology

Our objective is to provide an assessment of current and potential coverage of physical and functional rehabilitation care for persons with disabilities, with the final objective of contributing to more inclusive health systems in low- and middle-income countries (LMICs) for the most vulnerable people.

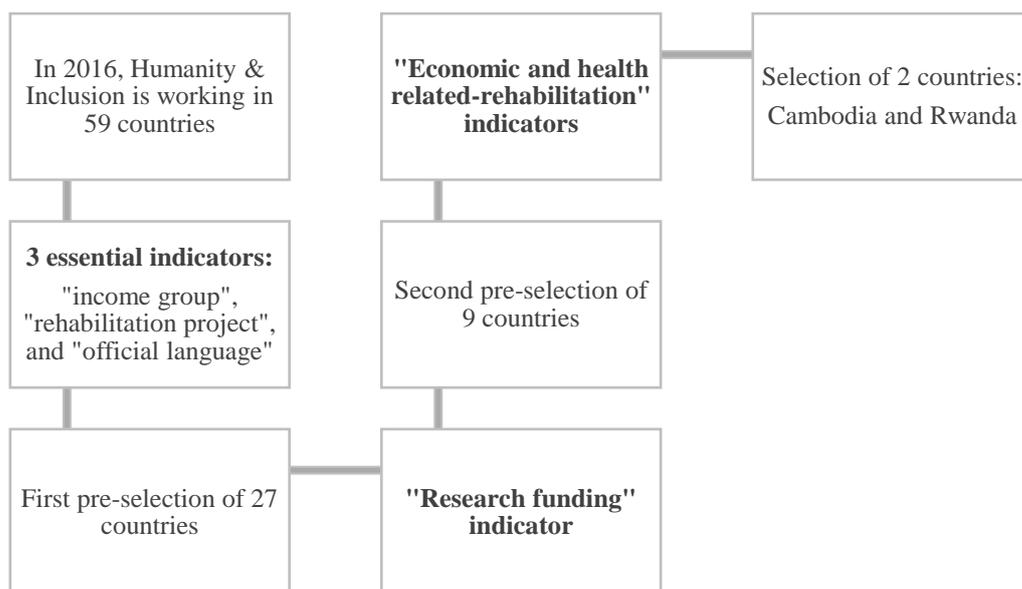
To complete this objective we organized our analysis in three chapters. The first one presents a situational analysis of physical and functional rehabilitation care in low- and middle-income countries (LMICs). In this chapter, the author performed a literature review in the following search websites: Google Scholar, Pubmed, the Lancet and Science Direct, including the following inclusion criteria: “access to care”, “ageing population”, “assistive technologies”, “disability”, “financing”, “healthcare barriers”, “poverty”, “leadership and governance in health systems”, “low- and middle- income countries” or “LMICs”, “non-communicable diseases” or “ncds”, “out-of-pocket payments”, “physical therapist” or “physical therapy”,

“prosthetics and orthotics”, “prosthetist and orthotist”, “rehabilitation workforce”, “rehabilitation” or “physical and functional rehabilitation”, “sustainable development goals” or “sdgs”, “universal health coverage” or ‘uhc”, “vulnerable persons”. We provide an overview of rehabilitation including main causes leading a person to seek for rehabilitation care, the rehabilitation legal framework and the risk of a growing demand for rehabilitation care in the next decades. Then we analyze barriers to access to care from the demand side of rehabilitation care, and we study in the next part the inadequate provision of rehabilitation services in LMICs. Finally, we dedicate the last part of that chapter to the general context of supply and demand side of rehabilitation through the study of governance and the coverage of rehabilitation care.

Chapters 2 and 3 are devoted to the economic analysis of the rehabilitation sector in two LMICs in order to corroborate theoretical statements developed in the first chapter. Cambodia and Rwanda were held up as examples to concretely understand how physical and functional rehabilitation services are financed, managed and covered by the government and potential non-governmental actors, and how people with and without disabilities use these services. Analysis of the rehabilitation sector will provide relevant and essential information to better understand how the provision of these services could be improved and how the access for vulnerable people, including people with disabilities, could be enhanced in a specific context. These lines of thought are presented in the general conclusion of the thesis.

According to Yazan (Yazan 2015), three main authors have outlined the research methodology for case studies, the most recognized one are: Yin (Yin 2004), Stake (Stake 1995) and Merriam (Merriam 1998). Yazan identified and compared six dimensions of interest in authors’ approaches: epistemological commitment, defining case and case study, designing case study, gathering data, analyzing data, and validating data (Yazan 2015). However, in our studies, the selection of countries and the definition of the research methodology is a mixed of these approaches as these recommendations mainly focused on qualitative case studies. The selection of these studied countries implies several inclusion criteria and a selection process summarized in the figure 2. This selection tried to be as rigorous as possible given the time and budget constraints of Humanity & Inclusion field team.

Figure 2: Countries' selection process for the case study



Source: Author.

Beforehand, selected country should host a local office of Handicap International Federation, which runs a rehabilitation project. Among 59 working countries of this non-governmental organization (NGO), we conducted a comparison analysis based on economic and health-related rehabilitation indicators.

There were three essential inclusion criteria for pre-selection of countries:

- 1) The country belongs to the upper-middle, lower-middle, or low-income groups, according to the World Bank classification (World Bank 2016d);
- 2) The country has a rehabilitation program or an ongoing rehabilitation project that includes an economic evaluation of the rehabilitation sector as an activity;
- 3) The official language of the country is English or French.

This pre-selection comprises 27 countries out of 59 (see list of countries in Appendix section, [link](#)).

We selected among the remaining countries those with the capacity to pay for the research study in their country, which brought us to nine countries that present a planned or recorded funding for this research. Case studies required the used of eight economic and health related-rehabilitation indicators:

- "Country's rank in the Corruption Perception Index (Transparency International 2016)";
- "Political situation";

- “Level of public health expenditures as a share of total health expenditures (World Bank 2014b)”;
- “Level of health expenditures per capita (World Bank 2014a)”;
- “Life expectancy at birth, total (World Bank 2015a)”;
- “Infant to child mortality ratio (World Bank 2015c)”;
- “Maternal mortality ratio per 100,00 live births (World Bank 2015b)”;
- “Mortality caused by road traffic injury (per 100,000 population) (World Health Organization 2013a)”.

The prevalence of disability and/or rehabilitation is not available worldwide per countries in a standardized calculation. Only national estimations usually based on national surveys such as demographic and health surveys were available. Therefore, no international comparison has been done, and thus this prevalence indicator has not been used as an inclusion criterion to select the country for the case study.

Based on this process, two countries have been identified, Cambodia, a middle-income country in South-East Asia, and Rwanda, a low-income country in East Africa.

Cambodia was ranked 150 out of 168 countries in the CPI 2016, which means a perception of a high corruption by the population. The country had an infant to child mortality ratio of 28.7 per 1,000 live births (WDI 2016), and a maternal mortality ratio of 161 per 100,000 live births in 2015 (WHO and al., 2015). The life expectancy at birth was 68.7 years in 2015 (WDI 2016). In 2013, mortality caused by road traffic injury was estimated by 17.4 per 100,000 population. In addition, public health expenditures represent 22.04% of total health expenditures, while health expenditures per capita were 61 US\$.

Rwanda was ranked 44 out of 168 countries; it means a rather well level of transparency, compared to other assessed countries. The infant to child mortality ratio is 41.7 per 1,000 live births in 2015 (WDI 2016), and the maternal mortality ratio is 290 per 100,000 live births over the period 1990-2015 (WHO and al., 2015). The life expectancy at birth was 66.1 years in 2015 (WDI 2016). In 2013, mortality caused by road traffic injury was estimated by 32.1 per 100,000 population. Moreover, public health expenditures accounts for 38.10% of total health expenditures, and health expenditures per capita was 52 US\$.

These two countries, one from Africa, one from South-East Asia, therefore present antagonistic profiles. Cambodia has a very high level of corruption but better health situation

compared to Rwanda, lower level of public health expenditures, and higher level of health expenditures per capita. Both countries have a history of conflict, the Cambodian genocide from 1975 to 1979 and Rwandan genocide in 1994. Finally these countries provide us a good analytical ground to assess whether or not the level of health expenditures, the governance, and the political strategy of a country may impact the progress towards a universal coverage that include rehabilitation services.

Within these countries, two field assignments have been realized during the thesis, from three to five weeks, in each selected country. The field mission implies data collection at all level of the healthcare pyramid with interviews with national key stakeholders involved in rehabilitation. The author was the main investigator for both field missions in Cambodia and in Rwanda. In Cambodia, the author was accompanied by a HI staff of the country for ease of translation and relations with key informants (see above). For interviews with state-actors, a governmental representative person accompanied the author and the rehabilitation program manager. Similarly, in Rwanda the rehabilitation project manager accompanied the author for the same reasons. In addition, two other persons have occasionally completed the team: national health economist and rehabilitation professional, both Rwandan and nationally recognized in their field of expertise. The choice of these persons was motivated to facilitate administrative requests to key informants and provide support for data collection.

Analysis of the rehabilitation sector in these countries cannot result in an international comparison. Each country deals with its own specific context and history regarding the building and strengthening of its health system over the years. Therefore, a comparison analysis will not make any sense with countries, which are so different. The interest of the field data collection and their analysis is to answer several crucial questions, for both HI and the two countries' Ministry of health.

Analyzed questions are:

- What has been done for rehabilitation in an African country and in an Asian country, according to their specificity?
- How rehabilitation services are included within the health system?
- How is the health coverage of these services for the population?
- What didn't work and why?
- What worked and why?

- What lessons can be learned from these countries?

Thanks to the Rwanda and Cambodia studies, we will be able to highlight key guidance elements associated with a set of variables such as the political situation in a country, the income level, the social protection situation, etc. Finally, we aim to ensure that policymakers make evidence-based decisions for rehabilitation care and persons who need it in low- and middle-income countries.

Within these two last chapters, we conducted qualitative and quantitative analysis. The research applied three main methods of data collection:

- Literature review
- Interviews of key informants
- Surveys

These three methods of data collection were complementary. These methods are designed to gather data on financial access to rehabilitation care (both qualitative and quantitative) and focused on four main areas of the economic system of rehabilitation: (i) the availability of rehabilitation services, (ii) the estimation of the costs charged to patients, (iii) the availability of social protection mechanisms, and (iv) the capacity of change of the rehabilitation system. Below is a description of some of the major steps in data collection for each method.

The literature review focused on policy documents, published papers and key materials including past research and studies on financial access to rehabilitation services and social protection programs in the country. This includes both grey and published literature, as well as official documents, and reports. The literature search process was broad enough to ensure that all information required is obtained, analytically reviewed and synthesized.

A purposive sampling technique was used to select relevant stakeholders. A list of relevant stakeholders was identified during the first introduction meeting between the author, HI representative and government representatives. Key Informants were grouped into two major categories: state and non-state actors. Non-state actors will include: academics, local and international implementing organizations, development partners, and independent researchers and practitioners. State actors will include key policy makers in Ministry of Health, Ministry

of Economic and Finance, Ministry of local governance and public bodies involved in rehabilitation such as a national institute of statistics.

Facilities that provide rehabilitation services were selected for data collection using purposive sampling strategy. Facility selection for this research was motivated by the need to represent all the levels of health delivery and give an entire spectrum of services providers (public, private-for-profit and private not-for-profit).

As part of a field mission, 11 rehabilitation facilities were studied in Cambodia. The sample contains 5 physical rehabilitation centers, 5 Hospitals (physical therapy units) and the Spinal Cord Injury Center, selected during the introduction meeting between the author, HI and government representatives.

In Rwanda, this study was conducted in twelve facilities that provide rehabilitation services. Twelve facilities represented all the levels of health delivery and gave an entire spectrum of services providers. Selected facilities included two public tertiary facilities, one provincial hospital, two districts hospitals, four semi-private rehabilitation centers and three primary-level private community rehabilitation centers.

Surveys were administered to selected facilities in both countries to the head of physiotherapy department, head of prosthetics and orthotics department, head of occupational therapy and, head of finance unit and facility administrators. This questionnaire helped to gather data on services availability, staffing, infrastructures, the technical level of a sample of services, quality of supplies and materials/equipment as well as the rehabilitation utilization rates¹ by departments among persons with disabilities. In addition, direct costs data and expenditures of facilities were gathered separately.

In addition, we estimated the cost charged to patients for rehabilitation services and compared it to the national level of catastrophic health expenditures. According to WHO (Xu 2005), health expenditures are considered to be catastrophic when a person spends more than 40% of its capacity-to-pay (or household non-subsistence income, i.e. income available after basic needs have been met) in out-of-pocket payments. The threshold of 40% should be adapted according to a country's specific situation, but it allows comparisons between countries.

¹Rehabilitation utilization rates according to different departments (Physical therapy (PT) and occupational therapy (OT), speech therapy, etc among persons with disabilities in 2016 and 2017).

However, we are aware of the debate surrounding the choice of catastrophic health expenditures. As some authors highlighted, this metric is not able to capture the volume of needed healthcare that is left behind “due to fear of impoverishment associated with utilization” (Moreno-Serra, Millett, and Smith 2011; Abihiro and De Allegri 2015). More precisely, catastrophic metric is exclusively based on out-of-pocket medical expenditures reported in surveys, and thus it does not include the fact that the poorest individuals cannot often afford to use health services. Therefore, these persons will declare very low or no health spending. Therefore, catastrophic health expenditure must reflect at least non-medical costs and loss of earnings (Abihiro and De Allegri 2015). That is the reason why we included the costs of transport and accommodation in the total cost of rehabilitation treatment when we compared this result to the level of catastrophic health expenditures. Nevertheless, the opportunity cost has not been taken into account for reasons of simplifications and time and budget constraints, even if we recommended including it for more representativeness of the reality faces by a patient. Moreover, the capacity-to-pay is expressed as the total consumption expenses per capita per year minus the national poverty line.

Another point of discussion regarding catastrophic health expenditure is the choice of the threshold. Commonly used thresholds include 30% or 40% of capacity to pay, or 10% of total expenditures (Lu and al. 2009). Wagstaff and al. justified that “the choice of the threshold level is based on the idea that households will be left with a certain balance of their pre-expenditure income or capacity to pay that would allow them to spend on other needs in the household” (Wagstaff and Van Doorslaer 2003). However, the debate on the catastrophic health expenditure standard is largely discussed, and there is currently no consensus in the existing literature on the appropriate threshold to measure catastrophic health expenditures (Aregbeshola and Khan 2018). According to Onoka and al. (Onoka and al. 2011) if the same threshold of 40% is used for all socio-economic status groups, there is a challenge in interpretation as the 60% of non-food expenditure has not the same utility for households, depending on their quintile or socio-economic status, it is the concept of diminishing marginal utility. Nevertheless, majority of studies on catastrophic health expenditures use methods proposed by Wagstaff and Van Doorslaer (Wagstaff and Van Doorslaer 2003), O’Donnell and al. (O’Donnell and al. 2008), and Xu (Xu 2005). In this thesis we have decided to keep the 40% threshold as defined in the approach used by Xu to measure catastrophic payments for healthcare (Xu 2005).

In Cambodia, we used the national daily poverty line per capita as defined in 2009²: Cambodia (3,871Riel), Phnom Penh (6,347Riel), other urban (4,352Riel), and rural (3,503Riel). In Cambodia, no distinction has been made related to a potential different level of consumption between different socioeconomic status of households surveyed. The percentage of the total population living below the poverty line fell to 21.1% in 2010, then 19.8% in 2011, and 18.9% in 2012. In Rwanda, the national poverty line per capita as defined according to the EICV4 and the poverty trend analysis report 2010/2011-2013/2014 were used. In addition, the total consumption per capita and per year as based on information collected by the fifth integrated household living conditions survey (EICV5) undertaken between October 2016 and October 2017 (NISR 2018) were used for calculations.

Once we calculated the level of catastrophic health expenditures in each country, we estimated the cost charged to patients for rehabilitation services.

- **The cost charged to patients in Cambodia was calculated as follows:**

Rehabilitation services in physical rehabilitation centers (PRCs) are currently free of charge, except three PRCs in Kien Khleang, Kratie, and Prey Veng (VIC) that propose voluntary contributions (suggested sliding fee) to patients according to a poverty assessment of their patients. In this part, it is assumed that PRCs do not provide free-of-charge care to patients. We took as a reference, fees applied by Veterans International Cambodia (VIC) PRCs in Cambodia. Suggested contributions are classified in 5 categories, according to the poverty assessment's score³ of the patient: category A (contribution from 71 to 100%), category B (contribution from 41 to 70%), category C (contribution from 21 to 40%) and categories D and E (no contribution requested).

In public hospital, patients have to pay fee-for-services to receive care. WHO estimates that 98% of health-care facilities implement user fees (WHO 2015b). Nonetheless, there are fees exemptions for poor patients in all public health facilities for those with the IDPoor⁴ card or for those who were classified as poor with the facility's assessment form.

Some allowances are provided to patients as food and travel allowances. In order to obtain an estimation of the amount of food and travel allowances per patient and per day we used data from public health facilities and PWDF, as described below:

² Last data available at the time of the study

³ Poverty assessment score is done at the first visit of the patient in the rehabilitation service. It assesses the capacity to pay of patients according to their sources of revenue, and socio-economic situation.

⁴ For more information see the Chapter 2, "3.4.3 Cambodian Identification of Poor Households Program" ([link](#))

- Cost of stay = 1 night stay (\$5-\$10) + 3 meals (\$1-\$3) → as PRCs' stay (food and stay) are free and public health facilities are charged, we took this price as an average.
- PWDF allowances in PRCs = \$0.74 per day
- PWDF travel allowance in PRCs = \$2.47
- PWDF allowances in public health facilities = \$7.41
- PWDF pension scheme = \$5

To estimate the travelling cost to a rehabilitation service, we calculate distances between each provincial capital (which is the assumed point of departure of the patient) and we then apply a cost for each travel with a bus ticket price as a referee (e.g. the travel from Siem Reap to Phnom Penh, 314km, which costs \$10).

We estimate the cost charged to the patient by applying the following formula: the cost is equal to medical cost and travel and food costs minus subsidies received. The real cost charged to the patient for rehabilitation services is thus under-estimated, as we are not taking into account up-stream costs (surgery, emergency, etc.), down-stream costs (housing rehabilitation, follow-up, etc.) and companions costs (travel and accommodation).

We estimated 4 types of costs, based on the definition of allowance mentioned above: total cost excluding stay without any allowance, total cost excluding stay with allowances, total cost including stay without any allowances, and total cost including stay with allowances.

And, for these types of costs we distinguished 4 modalities:

- The nearest rehabilitation facility from the patient's home (in the case of PT service = public facility)
- The nearest rehabilitation facility from the patient's home free of charge (in the case of P&O service= PRC)
- The higher level of the nearest rehabilitation facility from the patient's home (=VIC PRCs)
- The higher level of the nearest rehabilitation facility from the patient's home with free of charge services (=PRCs)

In this section, we assumed that the nearest physiotherapy service of the patient's home is the public hospital, according to our field mission, as individuals generally come first to a public health facility rather than a PRC. To estimate the nearest higher technical level facility we follow the results of the scoring of our sample. We also make the assumption that physiotherapy in public health facility have a lower technical level of services and that PRCs have a higher technical level of services. Therefore, in our calculations, we estimated a cost for public facility in all provincial capitals and we used the overall average. We did the same

for PRCs, we estimate for each provincial capital the nearest PRC and we used the overall average.

Estimations are realized for patients of physiotherapy services, prosthetics and orthotics (P&O), and speech therapy. For P&O services we calculated the cost based on (i) the average fees charged by VIC PRCs, (ii) maximum fees charged by VIC PRCs, and (iii) free P&O services with 10 physiotherapy sessions.

- **The cost charged to patients in Rwanda was calculated as follows:**

We followed the same method to calculate the cost charged to patients for rehabilitation services, physiotherapy and prosthetics and orthotics, in Rwanda.

We estimated the cost charged to the patient by applying the following formula: the cost is equal to medical, travel and food costs. The real cost charged to the patients for rehabilitation services is thus under-estimated, as we are not taking into account up-stream costs (surgery, emergency, etc.), down-stream costs (housing rehabilitation, follow-up, etc.) and companions costs (travel and accommodation).

We distinguished two main types of costs as charged to the patients of rehabilitation services with two modalities: total cost excluding stay, and total cost including stay. We did calculations for the nearest rehabilitation facility from the patient's home and for higher level of the nearest facility from the patient's home. We used the results of the assessment of the technical level of rehabilitation facilities to define the higher technical level of a rehabilitation facility. We used it as it follows the results of our sample.

To estimate the cost charged to the patients for physiotherapy, we took into account the average tariff of a consultation (c), the tariff of a patient registration (consultation recorded and eventual prescription), the number of sessions (n), the average tariff of a physiotherapy session (p), the average tariff for a return travel (t) and the daily cost of stay (s). In the formula, the "n-1" means that we do not take into account twice the first consultation (c). We obtained the following formulas:

Physiotherapy:

$$\text{Total cost}_{\text{excluding stay}} = c + \text{patient registration} + ((n - 1) \times p) + (n \times t)$$

$$\text{Total cost}_{\text{including stay}} = c + \text{patient registration} + ((n - 1) \times p) + (n \times s) + t$$

For prosthetics and orthotics (P&O), we used: the average tariff of a consultation (c), the tariff of a patient registration (consultation recorded and eventual prescription), the number of sessions (n), the average tariff of a device (d), the average tariff for a return travel (t) and the daily cost of stay (s).

Prosthetics and orthotics:

$$\text{Total cost}_{\text{excluding stay}} = c + \text{patient registration} + d + (n \times t)$$

$$\text{Total cost}_{\text{including stay}} = c + \text{patient registration} + d + (n \times s) + t$$

Finally, we also distinguished the cost for patients who have a social protection mechanism and those who do not benefit from any of them⁵.

The number of sessions required for each service was determined by using average as declared by rehabilitation professionals during our face-to-face interviews, see the table 1 below.

Practices for physiotherapy (number of sessions per week and number of weeks for all treatment period) vary from a service to another. In this section we studied the cost for 3 conditions: low back pain, cerebral palsy, and clubfoot, which are the most common type of pathologies treated in hospitals and rehabilitation centers according to our interviews:

For low back pain, the average duration of treatment is 3 to 24 weeks, and the number of sessions is 3 to 5 per week (Table 45). Average duration of treatment for cerebral palsy is 4 to 50 weeks and the number of sessions per week is 1 to 10. And for clubfoot, the average duration of treatment is 3 to 12 weeks, and the average number of sessions is 1 to 8 per week.

It was interesting to understand why there is high variation of treatment between services in Rwanda. A nationally rationalized evidence-based method per condition improved the effectiveness of a treatment and could reduce the cost for the patient and thus improve their financial access to physiotherapy (e.g. if there are less sessions and more empowerment of the patient). For instance, the duration of treatment for clubfoot with the Ponseti method (Staheli and Ponseti 2009) is 4 to 7 weeks with 1 session per week, and this method is internationally recognized as the most effective and least expensive treatment of clubfoot throughout the world over the past decade.

⁵ We made this distinction to be in line with the official tariffs of the Minisanté in Rwanda that differentiate several types of tariffs according of the type of social protection mechanism of patients (see examples of this tariffs in the appendix section, [here](#)).

For P&O services, we estimated that it required around 4 sessions for prosthetics and orthotics and 2 sessions for a wheelchair.

Table 1: Average number of physiotherapy and P&O sessions by type of condition.

Physiotherapy		Prosthetics and Orthotics		
Conditions	Average number of sessions required for the all treatment (for 1 year)	Devices	Length of service delivery	Average number of session with the patient for one (new) device
Low back pain	35	Prosthesis	5 days	4
Clubfoot	16	Orthosis	5 days	4
Cerebral palsy	52	Wheelchair	3 days	2

Source: Author, based on data collected.

We used official tariffs from the Ministry of Health which entered into force in January 2017 (Ministry of Health 2017a) in our estimations for physiotherapy and prosthetics and orthotics (P&O) services. For physiotherapy and P&O, we used the 5 types of tariffs, as described by the Minisanté that corresponded to 4 types of social coverage: “CBHI (*mutuelle*)”, “MMI and university and higher institutes *mutuelles*”, “RAMA”, “NGO, diplomat and private”, and the tariff for non-social coverage. Tariffs used are described in the table 2, and types of tariffs used are the following: A (CBHI, *mutuelle de santé*), B (MMI, MMI, *Mutuelles d'université* and *instituts supérieurs* (MIS/UR), C (RAMA), D (iNGO, Diplomat and private), E (Without health coverage).

Table 2: Tariffs of physiotherapy (A) and P&O (B), 2017

	CBHI, <i>mutuelle de santé</i>	MMI, University Medical insurance scheme	RAMA	INGO, Diplomat and private	Without health coverage
Consultation					
Consultation paramedical A0	900 RWF	2 070 RWF	2 250 RWF	2 588 RWF	3 105 RWF
Consultation paramedical A1	600 RWF	1 380 RWF	1 500 RWF	1 725 RWF	2 070 RWF
Consultation of paramedical master and more	1 200 RWF	2 760 RWF	3 000 RWF	3 450 RWF	4 140 RWF
<i>Average</i>	<i>900 RWF</i>	<i>2 070 RWF</i>	<i>2 250 RWF</i>	<i>2 588 RWF</i>	<i>3 105 RWF</i>
Patient registration	75 RWF	173 RWF	188 RWF	210 RWF	276 RWF
Prescription	50 RWF	58 RWF	63 RWF	70 RWF	92 RWF
Hospitalization					
Room of 4 beds	990 RWF	2 277 RWF	2 475 RWF	2 846 RWF	3 416 RWF
Common room	825 RWF	1 898 RWF	2 063 RWF	2 371 RWF	2 845 RWF

(more than 4 beds)					
<i>Average</i>	<i>908 RWF</i>	<i>2 088 RWF</i>	<i>2 269 RWF</i>	<i>2 609 RWF</i>	<i>3 131 RWF</i>
(A) Physiotherapy					
Physiotherapy sessions					
Massage, mobilisation	450 RWF	1 035 RWF	1 125 RWF	1 295 RWF	1 553 RWF
Electrotherapy	900 RWF	2 070 RWF	2 250 RWF	2 590 RWF	3 105 RWF
Strength training	900 RWF	2 070 RWF	2 250 RWF	2 590 RWF	3 105 RWF
<i>Average</i>	<i>750 RWF</i>	<i>1 725 RWF</i>	<i>1 875 RWF</i>	<i>2 158 RWF</i>	<i>2 588 RWF</i>
(B) Prosthetics and orthotics					
Walking aids					
Wheelchair	250 000 RWF	345 000 RWF	375 000 RWF	414 000 RWF	346 000 RWF
Orthotics					
Traced KAFO with drop lock knee joint and ankle joints imported	319 899 RWF	441 461 RWF	479 849 RWF	529 753 RWF	442 741 RWF
Thoracic-brachial orthosis	29 283 RWF	40 411 RWF	43 925 RWF	48 493 RWF	40 528 RWF
Prosthesis					
Aesthetic prosthetic arm / trans humeral in polypropylene (CICR)	212 780 RWF	293 636 RWF	319 170 RWF	352 364 RWF	294 488 RWF
Endoskeletal femoral prosthesis in polypropylene (CICR)	458 983 RWF	633 397 RWF	688 475 RWF	760 076 RWF	635 233 RWF

Source: Author, based on the MoH official tariff lists.

Since 2017, medical tariffs have been revised for medical insurance schemes such as RAMA/RSSB and private insurance firms. The last update of tariffs was in 2012. RAMA and RSSB beneficiaries supported an increase of 25% on previous tariff, and for beneficiaries of MMI and other private health insurance they paid an extra 15%. For those under the community-based health insurance-CBHI (*Mutuelle de santé*) it remained unchanged. Official reasons of these increases were to help hospitals to improve service delivery, increase capacity of hospitals to buy equipment and drugs.

To estimate the travelling cost to a rehabilitation service, we calculated distances between each provincial capital (which is the assumed point of departure of the patient) and applied a cost for each travel with a bus ticket price as a referee. To estimate the price per kilometer, we used data from our patients' database, data from a national bus company, and data from the Rwanda Utilities Regulatory Authority (RURA 2017) and we found an estimated price per kilometer of 27.95 RWF.

The cost of stay is determined by the cost per night in a health facility as defined by the Ministry of Health and we estimated a daily cost of meals by 3,000 RWF (around 1,000RWF for one meal). Based on the average of one-night stay at a national hospital or a referral center

in a room of 4 beds and a common room or more than 4 beds, the cost per night is between 908 RWF and 3,131 RWF, according to the type of health coverage. We thus found a cost of stay from 3,908 RWF to 6,131 RWF.

Furthermore, in Cambodia, an additional research work has been conducted in order to estimate the capacity to pay of patients in physical rehabilitation centers (PRCs) with the aim to promote equity and equal access to rehabilitation services. Cambodian PRCs are using their own tool or the IDPoor questionnaire, developed by the government, to assess whether or not a patient is able to pay for rehabilitation care, or just to assess if the patient should receive a per diem. We worked with a PRC managed by HI, located in Kampong Cham, to provide support in the development of a comprehensive tool that will reveal the current capacity to pay of patients for rehabilitation care, a socio-economic assessment of patients. Kampong Cham PRC initially developed a “poverty assessment” tool of patients that helps to decide whether or not a patient should receive a per diem for transportation. As explained in the corresponding section, there was a need to develop another tool, more comprehensive and inclusive for all patients. The Humanity & Inclusion’s team in Cambodia worked to develop a new tool addressing issues of the previous one, with the aim to identify how much will be the financial contribution of a patient in the PRC based on its capacity to pay. However, this new version of the tool still presented some issues and our work consisted in reviewing existing tools and developed a new one according to identified challenges.

In the last section of the Chapter 3, a deeper analysis has been performed in Rwanda in order to estimate the potential economic gains for the government as a result of relevant expenses in the rehabilitation sector and the inclusion of persons with disabilities in the labor market.

Literature of the “economic gains” methodology is rich. Commonly, it is usual to talk about productivity cost, production gains or “indirect costs and benefits” of health care. According to Olsen and Richardson, production gains are indirect benefits of cost effectiveness analysis (Olsen and Richardson 1999). In this type of study, costs are opposed to benefits, and these costs and benefits can be direct or indirect. Direct costs include all health care costs (HC), and indirect costs correspond to the non-health care costs which accompany the treatment, also known as production loss (PL). While direct benefits are health gains (H) (non-monetarized such as life years or quality adjusted life years – QALYs) and indirect benefits are the production gains (PG). They thus defined the production gains as the “value of the increased

output which is attributable to the treatment”. Finally, Olsen and Richardson obtain the result of the cost effectiveness analysis is the following cost effectiveness ratio:

$$\frac{[\text{Direct costs} + (\text{indirect cost} - \text{indirect benefits})]}{\text{Direct benefits}} = \frac{[\text{HC} + (\text{PL} - \text{PG})]}{\text{H}}$$

In addition, two main methods exist in the literature for measuring the production gains: human capital and friction cost (Olsen and Richardson 1999). According to the authors, the human capital approach estimates the production gains through the averted lost earnings where gross earnings are the “proxy for the value of one’s output and the present value of the future stream of earnings become one way of measuring the production gain to society of a person’s return to work” (Olsen and Richardson 1999). Koopmanschap and al. (Koopmanschap and van Ineveld 1992; Koopmanschap and Rutten 1993; Koopmanschap and al. 1995) justified that a society with a high unemployment rate, sick employees can possibly be replaced from the unemployment pool. Thus, the “avoided lost output would depend upon the reduced productivity of each of the people affected and the length of time before productivity returned to normal”(Koopmanschap and al. 1995). Therefore, the difference with the human capital approach is the temporary concept of the lost output to society. This method address the issue of the overestimation of lost output measured with the human capital technique (Olsen and Richardson 1999). Furthermore, Olsen and Richardson studied the production gains from healthcare and highlighted that there are socially relevant and socially irrelevant production gains (Olsen and Richardson 1999). They mentioned that the “magnitude of the socially relevant part of the production gains might vary between countries as it depends, first, upon differences in patients’ potential contributions to the rest of society (tax rates), and second, the strength of preferences for equity (Olsen and Richardson 1999).

The estimation of production gains is particularly used to in the area of HIV/AIDS and the potential economic gains due to an antiretroviral therapy (Hogan and al. 2005; Bishai, Colchero, and Durack 2007; Resch and al. 2011). In a study conducted by Resch and al. authors estimated the total program costs and compares them with selected economic benefits of an antiretroviral therapy (Resch and al. 2011). They founded that the expected return to investment will be due to the increased of labor productivity, averted orphan care, and delayed medical treatment for opportunistic infections and end-of-life care. They defined several assumptions regarding the labor productivity effects of HIV infections, AIDS disease and antiretroviral therapy and observed monetary benefits expressed in percentage of the program costs over the same period.

As mentioned above, in the chapter 3 we estimate the economic gains for the government due to expenses in rehabilitation sector, and we select the method that estimate the “production gains” as used by Olsen and Richardson (Olsen and Richardson 1999). However, we would have liked to carry out more in-depth cost-effectiveness analysis, in particular by calculating direct and indirect costs and benefits as a whole. Yet, due to a lack of data and strict budgetary and time constraints, we focused our analysis on calculating production costs according to several scenarios, as described below. We assume that if persons with disabilities have a better access to rehabilitation care and are not anymore left out of the health system because of financial constraints, they will be in better health and able to be integrated in the formal sector and have a regular income. As mentioned above, persons with disabilities have a higher risk to live behind the poverty line in comparison to persons without disability because of their condition. This is the reason why investing in the rehabilitation sector will enable these persons to break out of this vicious circle of disability and poverty. Integration of persons with disabilities in the formal sector will make possible increase of tax revenue for the government. Therefore, investing in rehabilitation is a high opportunity for the government to reduce unemployment of persons with disabilities through the development of financial access to high quality rehabilitation services for the population and tax revenues. In this section, we first estimated the expenses required in order to cover rehabilitation needs in Rwanda, then we focused on the estimation of economic gains for the government due to rehabilitation expenses.

We estimated expenses required to cover all rehabilitation needs for persons with disabilities in Rwanda based on the average tariffs, the number of persons with disabilities and those who need physiotherapy and prosthetics and orthotics services. We also compared these estimated costs with government budgets.

Then we estimated expenses required at health center’s level. During the field mission, a recurrent issue was raised about the congestion of physiotherapy services and, we analyzed that this is mostly due to poor patient referrals and a lack of services. Most of them thought that a solution to ease the congestion and to increase access to rehabilitation services was to create in each health center a physiotherapy unit with basic equipment and one physiotherapist. This is the reason why we estimated how much it will cost to the government to open a small physiotherapy unit at health centers’ level. We used the estimated operating cost of a physiotherapy service, and we included the salary of a physiotherapist in Rwanda.

Finally, we estimated the economic gains for the government due to rehabilitation expenses. To proceed, we first analyzed the labor market for people with disabilities in the country. Secondly, to estimate if there is a potential return on expenses for the government we estimated the economic gains due to the financial coverage of rehabilitation services for persons with disabilities, according to several scenarios. The main assumption made here is that some persons with disabilities will find a job as a result of their access to rehabilitation care and it will contribute to the increase of the productivity gains. Defined scenarios are based on a number of different situations potentially faced by persons with disabilities in terms of access to care with full treatment, employment rate, salaries and hours of work. We thus estimate the economic gains by evaluate the gathered revenue of the value-added tax (VAT) on an average annual level for consumption in Rwanda and the annual tax band revenue. Lastly, to estimate the return on expenses we assumed a 5 years plan where the government will have to make initial expenses in year 0, and collect each year the return of its expenses. This projection revealed a total return on expenses for 5 years, according to the tariff for patients who benefit from the community based health insurance (*mutuelle de santé*): However, some limitations exist in this section as some data were not available for further analysis. Other projections should be made according to the stability of employment on short, medium and long term and the trends regarding the risk of unemployment, probability to obtain a higher salary in each category of work. Other factors that could influence the economic gains may be: the education level of persons with disabilities and their current distribution between job categories in the society. In addition, there is uncertainty regarding the health condition of persons with disabilities newly employed that may face other health issues that constraint their ability to work. Finally, policymakers that intend to use these results must be careful with these outcomes as it is only valid for Rwanda.

Ethics considerations have been taken into account for the implementation of studies in Cambodia and in Rwanda. In Cambodia, official authorization letter has been obtained from the Ministry of Social Affairs, Veterans and Youth Rehabilitation and the Ministry of Health to conduct this study. In Rwanda, the research proposal submitted by Humanity & Inclusion was both reviewed and approved by the National Health Research Committee (NHRC) and Rwanda National Ethic Committee (RNEC) from the Ministry of Health prior to data collection.

Chapter 1: A situational analysis of physical and functional rehabilitation in low- and middle-income countries (LMICs)

1. Overview of rehabilitation in LMICs

Disability is not considered a 'health problem'. However, there is an increased in health needs for some people with disabilities, and all people with disabilities have the same right to access health services as others, people without disabilities (Mannan and MacLachlan 2013). There is a scarce of literature concerning the determinants of disability and rehabilitation.

According to WHO (WHO Africa 2017), people with disabilities are more vulnerable to secondary conditions, co-morbid conditions, age-related conditions, and they are more engaging in health risk behaviors and higher rates of premature death.

Table 3: Vulnerability of people with disabilities

Conditions	In relation to people with disabilities health-issues
Secondary conditions	They occur in addition to, and are related to, a primary health condition, and are both predictable and therefore preventable. E.g. pressure ulcers, urinary tract infections, osteoporosis and pain.
Co-morbid conditions	It occurs in addition to (and are unrelated to) a primary health condition associated with disability. For example the prevalence of diabetes in people with schizophrenia is around 15% compared to a rate of 2-3% for the general population.
Age-related conditions	The ageing process for some groups of people with disabilities begins earlier than usual. For example some people with developmental disabilities show signs of premature ageing in their 40s and 50s.
Health risk behaviors	Some studies have indicated that people with disabilities have higher rates of risky behaviors such as smoking, poor diet and physical inactivity.
Premature death	Mortality rates for people with disabilities vary depending on the health condition. However an investigation in the United Kingdom found that people with mental health disorders and intellectual impairments had a lower life expectancy.

Source: Author, based on WHO Africa, 2017.

A study (Weigl and al. 2008) examined determinants of disability in musculoskeletal conditions (MSC) for the following conditions: rheumatoid arthritis, osteoporosis, osteoarthritis, low back pain and chronic wide spread pain. They used the International Classification of Functioning, Disability and Health developed by the World Health Organization (WHO) and literature review to determine disability factors of the MSC. Personal factors relevant to disability in the International Classification of Functioning,

Disability and Health are “person’s coping style”, “self-efficacy”, “beliefs and attitudes of the patients towards disease and disability”, “stress”, “depression”, “physical activity”, comorbidity”, “socioeconomic status” and the “profession linked to the working conditions and job satisfaction”.

Since the past decades, middle-income countries face an epidemiological transition from communicable to non-communicable diseases (NCDs), particularly cardiovascular and chronic respiratory diseases, cancer, diabetes, obesity, musculoskeletal conditions and mental health disorders. According to WHO, over 75% of total deaths occurred worldwide in 2016 were due to NCDs (Norheim and al. 2015).

Moreover, NCDs are particularly linked to population ageing as they mainly affect older people and future trend highlight an acceleration of this process. Prince and al. (2015) estimated that 23% of the total global burden of disease is due to attributable to diseases in people over 60 years old. Therefore, the combination of factors, population ageing and epidemiological transition will impact at a higher proportion health status of the world population that will be more at risk to experience disability and have functioning limitations (Stucki and al. 2018). Stucki and al. listed main functioning limitations associated with chronic NCDs and ageing: long-term sensory, cognitive, mobility and other impairments as well as restrictions in activities, simple or complex.

1.1.Rehabilitation legal framework

The first international legal framework that promotes persons with disabilities equal rights was the United Nations Convention on the Rights of Persons with Disabilities (CRPD), adopted by the United Nations General Assembly in 2006 and ratified by 177 states (United Nations 2006). The CRPD put the rehabilitation as a key component in order to enable people with disabilities to reach and maintain a maximum independence and full inclusion and participation in all aspects of their life. One article of the CRPD, article 26, focused on habilitation and rehabilitation and stipulated that there is a need from governments to organize, strengthen and extend comprehensive habilitation and rehabilitation services and programs. Article 20 of the CRPD argued that government should provide training in mobility skills and mobility aids, devices and assistive technologies. And the article 25 “recognizes the

right of persons with disabilities to the enjoyment of the highest attainable standard of health, without discrimination on the basis of disability and responding to individual needs”.

Over the last decades, international community supported by WHO members states committed about rehabilitation and assistive technologies through their commitment to strengthen provision of quality rehabilitation at all levels of the health system.

In the “Global Disability Action Plan 2014-2021” (World Health Organization 2015), a strategic objective is to strengthen and extend rehabilitation, as well as habilitation, assistive technology, assistance and support services, and community-based rehabilitation.

In the Rehabilitation 2030: Call for action, aims to raise the profile of rehabilitation through joint commitments of parties. Then, initiatives have been developed in Rehabilitation 2030, it proposes supplementary guidance to government and how to catalyze resources for rehabilitation (Humanity & Inclusion and Global Rehabilitation Alliance 2019).

In 2018, a focused has been made for assistive technologies during the World Health Assembly in Geneva where member states adopted the “Resolution on Improving Access to Assistive Technologies” and launched AT2030 and ATScale in order to develop “partnerships for innovation, affordability and accessibility of assistive technologies” (WHO 2018b). Forty years after the Alma Ata Declaration, WHO developed a policy support to rehabilitation from the declaration of primary health care adopted in Astana (WHO 2018a) that argued that rehabilitation is an important component of primary health care.

And last but not least, the Agenda 2030 and the Sustainable Development Goals (SDGs) highlighted the promotion of rehabilitation to extend life expectancy through the universal health coverage (UHC) and access to quality health care (United Nations 2015).

1.2. Risk of a growing demand for rehabilitation care in the next decades in LMICs

Demand for rehabilitation services will continue to increase in light of global health and demographic trends: populations are ageing, there is an increase of the prevalence of non-communicable diseases, as well as consequences of injuries (WHO 2017b).

Early life environmental exposures can lead to later-life health problems (Shin 2016). For instance, some high-risk environments are maternal toxic exposures, oxidative stress, low birth weight, malnutrition, and violence and injuries. During his life, a person may face some health issues that will conduct him to seek for rehabilitation care such as non-communicable diseases like cardiovascular diseases or diabetes, Alzheimer, dementia, or Parkinson.

Globally the rate of road accidents is increasing and the consequences are deaths, injuries, physical disabilities and psychological distress that create negative economic impact on victims, their families and society in general, particularly in low and middle-income countries. Road crashes cause every year, about 1,25 million people killed and from 20 to 50 million people seriously injured worldwide. Road traffic injuries are now considered as a major issue for public health. Indeed, within the sustainable development goals, a specific target is “halve the number of global death and injuries from road traffic accidents”.

Additionally, according to the Decade of Action For Road Safety 2011-2020 (WHO 2010a) five pillars of action should address road safety management, safer roads and mobility, safer vehicles, safer road patients, and post-crash response. Providing rehabilitation services to road traffic victims is last pillar (post-crash response).

The epidemiological transition has started in several middle-income economies, and can be accelerated due to demographic changes in age structure of the population. This is reflected in the decline of the infant mortality and a lower fertility that leads to lower youth dependency rates (Canning, Raja, and Yazbeck 2016).

Declines in mortality, and increase longevity are the consequences of major health-care efforts in LMICs. However, the increase of the older population conducted to an increase of the prevalence rates of non-communicable diseases and of old age disability, which create health demand that many health systems are not able to address. According to Kämpfen and al. (Kämpfen and al., 2018), the burden of non-communicable diseases and infectious diseases in low resources economies conducts to difficulties to implement appropriate answers to aging populations (Ebrahim and al. 2013). The risk is thus for LMICs to be trap in a vicious circle that aggravate the burden of non-communicable diseases due to poor health, lack of resources and limited functioning of the health system (Kämpfen, Wijemunige, and Evangelista 2018).

Non-communicable diseases (NCDs) are one of the most leading causes of disability in LMICs (WHO and World Bank 2011). For instance diabetes is one of the major causes of lower-limb amputation (Humanity & Inclusion and al., 2016), and diabetes complications can lead to a loss of productivity and life-long care (Siegel and Narayan 2008; Sinclair and Rodriguez-Mañas 2016). Nonetheless, there is a paradox related to the prevalence and financing of non-communicable diseases worldwide. Indeed, non-communicable diseases are included in the top ten threats to global health in 2019 (World Health Organization 2019), thus this is one of the greatest public health issue in the world. However, it appears that for most of donors the NCDs as a main policy. As developed in the part 2 of this thesis, the Institute for Health Metrics and Evaluation estimated that NCDs sector received 23% of development assistance for health, 0% of specific funding, while it represents 50% of the total burden of disease (Institute for Health Metrics and Evaluation (IHME) 2016). Thus, there is a distended link between the materiality of facts and the attention given to the health problem.

In the literature, men and women aged over 60 years old and above are considered as older persons (Age and Disability Consortium 2015). We will take into account this definition in this thesis. According to the United Nations, the world's population is ageing. All countries are experiencing a growth in the number and proportion of older persons in their population. Furthermore, it estimated that 13% of the population is aged 60 years or over in 2017 (United Nations 2016), and this share is expected to double by 2050 as the population aged 60 and over is growing faster than all younger age groups. The ageing population worldwide is a problematic as for rehabilitation, older people with disabilities have greater healthcare needs (Polack and McGivern 2018) and thus greater rehabilitation needs. Older people will participate to growth the demand of rehabilitation care in next decades. For instance, in China, while the overall prevalence of disability dropped between 1987 and 2006, the number of people with disabilities continues to increase, particularly in the age-adjusted prevalence of disability among males (Zheng and al. 2011).

The number of elderly people trapped in humanitarian emergencies has risen in recent years, and, according to it will probably continue to increase for two reasons: demographic because the growth will continue to be greatest in developing regions, and emergencies are affecting more people (Duault, Brown, and Fried 2018). Additionally, over the past decades the number of people that require prosthetics and orthotics services has raised because of the growing world's population and the increase of life expectancy. Thus, if a larger proportion of the

ageing population will have a disability, the need for rehabilitation services will increase proportionally (WHO 2015a). As seen before, the likely increase of musculoskeletal conditions and non-communicable diseases will greatly induced an increase of rehabilitation needs. Therefore, and according to WHO, by 2050 the proportion of the world's population that will require prosthetics and orthotics services will be around 1% (WHO 2017a).

Chatterji and al. (Chatterji and al. 2015) brought another perspective to the issue of ageing population and its implications for health systems, particularly in low- and middle-income countries. They wondered if older generations will be healthier than those that have preceded them, and if health systems, through ensuring maintained functioning and well-being of populations, will enable to add lifetime to these populations. They identified that in high income countries there is a compression of morbidity, i.e. a demographic change that is characterized late onset of disability and by an increasingly dependency among elderly because of increase of the life expectancy. But, there are some doubts about the health of future older generations because of potential exposures to different risk factors, and trends linked to the increase of chronic diseases prevalence. However, there is a lack of evidence for low- and middle income countries about compression, and there is uncertainty about potential expansion of morbidity due to lifestyle risks factors and the increase of chronic diseases.

Moreover, another factor that may lead to an increase of rehabilitation needs in the next decades are displaces and migrants issues. For instance, in South Sudan, around 250,000 people with disabilities are living in displacement camps. The issue in this country revealed the all difficulties for addressing this issue as decades of war conducted to the increase of people living with disabilities. However, needs of these persons are not a priority in national plans. It results in exclusion of persons with disabilities through extensive discrimination and lower participation in the community activities, which leads to less access to jobs, education and health services. The pervasive lack of visibility for people with disabilities in the country is one of the greatest challenges to better serving them, especially when it comes to collecting data (Mednick 2019) . The problematic faced in South Sudan may be generalized to other countries, and based on current situation for migrants and displaced, the need to access to healthcare and rehabilitation services may grow in the next years.

2. Barriers to access to rehabilitation: analysis of the demand side

2.1. Overview of barriers to access to health and rehabilitation services

Worldwide, 100 million people fall into poverty as a result of dependent health care spending. 150 million people, including 35 million Africans, are facing a financial disaster for the same reason (World Health Organization and International Bank for Reconstruction and Development 2017). This problematic of access to healthcare and partial or absent health coverage mainly affects population in low- and middle-income countries.

When people with disabilities seek for rehabilitation care they face a range of barriers to access to this service: prohibitive costs, limited availability of services, physical barriers, and inadequate skills and knowledge of health workers (WHO Africa 2017). Prohibitive costs are mainly due to the cost of health and rehabilitation services and the cost of transportation. There is globally a lack of available rehabilitation services for people with disabilities; this is the second most significant barriers of access to health service. According to WHO, the physical barriers are due to an “uneven access to health facilities, inaccessible medical equipment, poor signage, narrow doorways, internal steps, inadequate bathroom facilities, and inaccessible parking areas create barriers to health care facilities. Last main barrier to access to care for people with disabilities is due to inadequate skills and knowledge of health workers.

Needed access to rehabilitation services may be problematic mainly because of the lack of rehabilitation workers, in particular in lower-income countries. There is also a lack of availability of rehabilitation providers and for those who exist they are mainly located and concentrated in urban areas which decrease the accessibility for numerous of people with disabilities living in rural areas. Additionally, access to rehabilitation services can be problematic due to the lack of universal health coverage for even basic rehabilitation care such as physiotherapy. Finally, the low employment rate of people with disabilities, higher health spending and lower mobility contribute to a lower access to healthcare, compared to persons without disabilities. Authors added that the costs of services, the lack of transportation or the lack of physically accessible facilities are also access barriers to rehabilitation care for people with disabilities.

Literature provides extensive evidence of the existence of barriers to access to healthcare, but as Ensor and Cooper noticed, literature remains very small on interventions to address these

barriers (Ensor and Cooper 2004). Some authors presented analytical framework to enable policymakers to design and select interventions in order to address access barriers to healthcare.

The first conceptual framework, of healthcare access in low- and middle-income countries, commonly recognized within development actors, was developed by Peters and al. in 2008 (Peters and al., 2008). He argued that four main dimensions of access to healthcare make up the framework: geographic accessibility, availability, financial accessibility, and acceptability. However, four years before, Ensor and Cooper (Ensor and Cooper 2004) tried to categorize barriers to access health services, while Peters went further by analyzing the dimension of barriers. Jacobs and al. (Jacobs and al. 2012) compared the two frameworks (Table 4). There is crossover between Peters and al and Ensor and Cooper frameworks, but dimensions of Peters and al’s framework may interact with each other as they are not conflicting.

Table 4: Comparison between Peters and al. (2008) and Ensor and Cooper (2004) frameworks to access to healthcare services

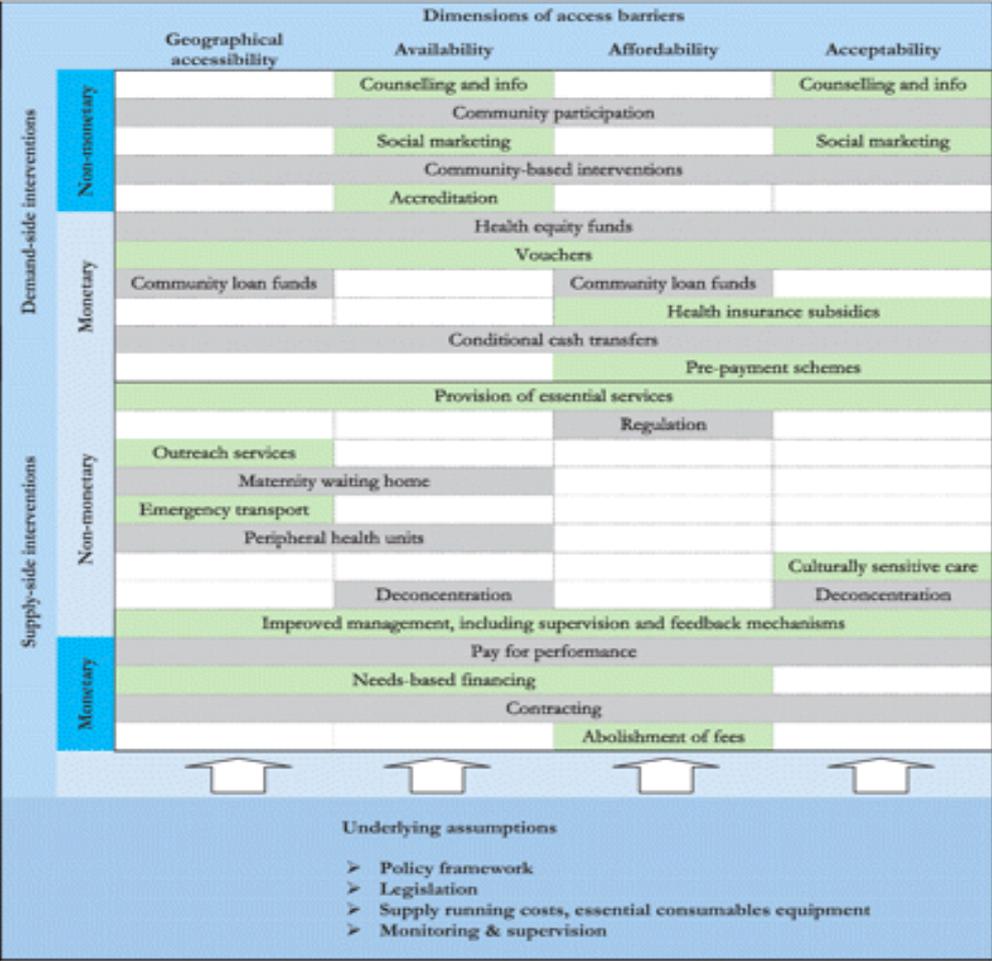
Dimension of barriers (Peter and al)	Barriers (Ensor and Cooper)
Geographic accessibility Service location Household location	Indirect costs to household such as transport cost
Availability Health workers, drugs, equipment Demand for services	Waiting time Wages quality of staff Price and quality of drugs and other consumables Information on health care choice/providers education
Affordability Costs and prices of services Household resources and willingness to pay	Direct price of service, including informal fees Opportunity costs
Acceptability Characteristics of the health services User’s attitude and expectations	Management/staff efficiency Technology Household expectations Community and cultural preferences, attitudes and norms

Source: Author, adapted from (Jacobs and al., 2012)

Furthermore, Jacobs and al. extended this framework and added interventions that should increase access to health services (Jacobs and al., 2012). Authors made a distinction between supply-side and demand-side interventions, and non-monetary and financial interventions. According to them, non-monetary interventions from demand-side barriers are the following: counselling and consumer information on health services, community participation, social

marketing/franchising, community-based interventions, and accreditation to indicate better providers. The financial interventions on the demand-side are the following: health equity funds, vouchers, community-loan funds to pay for transport, health insurance subsidies for the poor, conditional cash transfers, prepayment schemes, pay for performance, needs-based financing, abolishment of user fees, and contracting (Figure 3).

Figure 3: Analytical framework for interventions addressing demand- and supply-side barriers to health at district level



Source: (Jacobs and al., 2012)

The access to care situation was described according to the five areas of Levesque’s conceptual framework and new information was emerged from this thematic analysis. Moreover, Levesque and al. described a conceptual framework in the access to care situation including five dimensions of accessibility: approachability; acceptability; availability and accommodation; affordability and appropriateness (Levesque, Harris, and Russell 2013). Additionally, the authors added five corresponding abilities of populations that interact with

the five aforementioned dimensions that include: ability to perceive, ability to seek, ability to reach, ability to pay and ability to engage.

Bright and al. (Bright and al. 2017) realized a systematic review of access to rehabilitation for persons with disabilities in LMICs where they identified barriers to accessing rehabilitation as reported across studies. Their results are in line with WHO and the international community.

They identified six broad groups of interventions that aim to increase access to health services for children in low- and middle-income countries on the supply-side: delivery of services close to home, service level improvements through financial and non-financial interventions; and on the demand-side: health promotion/education, text message reminders, and financial or other incentives. All these interventions target dimensions of health care access as identified by Peters and Jacobs (Jacobs and al. 2012; Peters and al. 2008): geographic accessibility, availability, affordability, and acceptability. The most effective interventions that better addresses barriers to access to healthcare services, according to Bright and al. review, were the use of text messages and the delivery of services closer to home.

2.2. Financial accessibility to rehabilitation care

Evidence on access to rehabilitation services remains sparse. Actually, there is no consensus about the definition of access to health services in the literature. Campbell and al. defined access to health services as the timely use of services according to need, in terms of equity: equally accessible to effective care for all users, and greater access to effective care for those with more need (Campbell, Roland, and Buetow 2000). Additionally, some authors made a distinction between available services and opportunity for use, and the actual use of healthcare (Peters and al. 2008). Thus, access to health services can be considered as services that have satisfied the need.

Financial accessibility is defined by Peters and al. as the relationship between costs of health services and the willingness and ability of users to pay for those services (Peters and al. 2008), as well as be protected from catastrophic health expenditures. Additionally, Peters made a distinction between financial accessibility and geographic accessibility that are de facto closely related. Indeed, geographic accessibility refers to the distance between patient's home (travel time) and the service delivery facility, and thus more a facility is far from

patient's home more the cost of transport is important and more this cost can be a critical financial barrier for patients.

2.2.1. Poverty and rehabilitation

Scientific literature provides strong evidence that poverty and disability are linked in a vicious circle where poverty can lead a person to disability and disability to poverty (Banks and al., 2017). Authors analyzed the association between poverty and disability through a systematic review of 150 studies in low- and middle-income countries between 1990 and March 2016. They demonstrated that there is a positive association between disability and economic poverty with 81.3% of studies that report a statistically significant and positive relationship between these two variables (Banks and al., 2017).

Additionally, persons with disabilities have a 50% higher risk, compared to population without disabilities, to face catastrophic health expenditures. Disability is significantly associated with higher multidimensional poverty and higher healthcare spending (Mitra, Posarac, and Vick 2013).

Employment of persons with disabilities: In addition to prohibitive costs of rehabilitation care that induce a vicious circle between poverty and disability, there is an important corpus of studies about barriers faced by persons with disabilities for employment. This is link to a lack of education, limited self-expectation about work ability and wider social attitudes, and employment-specific barriers such as physical inaccessibility of workplaces (Emmett, 2006; Mitra and Sambamoorthi, 2006; Organisation for Economic Co-operation and Development, 2010; Tripney and al., 2019) .

In low- and middle-income countries, several studies estimated that 80% of working-age persons with disabilities are unemployed, where in high income countries the share is fifty percent less (Mitra and al., 2013; Organisation for Economic Co-operation and Development, 2010; Tripney and al., 2019). And, if persons with disabilities have a job, they usually work for longer hours and lower incomes, have fewer chances to be promoted and they face a higher of becoming unemployed for longer periods (Mitra and Sambamoorthi 2006; Organisation for Economic Co-operation and Development 2010). In addition, persons with disabilities mainly work in the informal sector, as described by the International Labor Organization as “a group of production units which form a part, within the System of National

Accounts, of the household sector as unincorporated enterprises owned by households” (Nural 2002). Barriers, faced by persons with disabilities, hinder their access to sustainable employment and contribute to push them into the vicious circle poverty and disability.

In the labor market, different groups of disabilities face different issues that is the reason why it is important to make a distinction between people who have disabilities during childhood, and those who have disabilities later in life, from working age. According to Baldwin and Johnson, the group of people with disabilities during childhood will face discrimination in education and upon entry to work, whereas the second group may be affected when returning to work after an illness (Baldwin and Johnson 2006). Social programs have to take timing disability onset into consideration when implementing interventions. Usually and according to the review of these authors, programs mainly focused on interventions that aim to modify discriminatory behaviors of employers, and interventions that address discriminatory attitudes within community.

2.2.2. Out-of-pocket payments and the risk of catastrophic health expenditures

Out-of-pocket payments or health spending are payments made by individuals for health maintenance, restoration or enhancement at or after the time of health care delivery, including health insurance copayments or payments devoted to deductibles (health insurance premiums are not considered out-of-pocket) (IHME 2019).

In average, 41% of total health expenditure are coming from out-of-pocket payments of households worldwide (International Labor Organization 2015). According to the Institute for Health Metrics and Evaluation (IHME 2019), the share of health spending from out-of-pocket should increase by 2050. From 1995 to 2050, upper-middle income countries are projected to grow their out-of-pocket payments by 2.6% annually. Authors observed that as countries get wealthier, less of their health spending is financed by development assistance for health (DAH), and they thus tend to fill the gap with out-of-pocket with an increase of government health spending as economies grow. However, there are still huge disparities, in particular for low-income countries that should remain hardly dependent to DAH. This statement is not in favor of the achievement of the sustainable development goals for health.

According to ILO, 73% of the world's population does not enjoy full social protection, and about half do not have access to it (International Labor Organization 2015). They defined four

social protection floors: universal access to health care, social protection for children, social protection for people of working-age, and pensions and care for older persons. They argued that social protection floors should be progressively extended for all population groups, including persons with disabilities. In countries where some households are not covered by any form of health insurance, or households headed by women or with elderly members are more at risk to face financial catastrophe and impoverishment because of health care spending because they will pay out-of-pocket for these services (Global Financing Facility 2018).

Moreover, the health financing transition can be facilitated by putting high priority on health and increase total government spending for health. This will conduct countries to progressively substitute high out-of-pocket spending by gradually increase of domestic resources for health, in order to avoid catastrophic health expenditures for most vulnerable people. Achieving universal health coverage and the 2030 Agenda will be done by sustaining increase of the quantity, equity and efficiency of health financing (IHME 2019).

Health expenditures are considered to be catastrophic when a person spends more than 40% of its capacity-to-pay (or household non-subsistence income, i.e. income available after basic needs have been met) in out-of-pocket payments. The threshold of 40% may be adapted according to a country's specific situation, but it allows comparisons between countries, according to the WHO methodology.

To date, the literature is very limited in terms of analysis of out-of-pocket spending for persons with disabilities. There is a lack of information about real cost incurred to people with disabilities when they seek for rehabilitation care. In the two case studies of this thesis in Cambodia and Rwanda, we analyzed the cost of physical rehabilitation care for patients seeking physiotherapy and prosthetics and orthotics devices, and we included the potential cost of transport and accommodation.

In Cambodia, rehabilitation services provided for free at physical rehabilitation centers as the majority of them are managed by non-governmental organizations. Physical rehabilitation centers that are under the management of the government may conduct to catastrophic health expenditures, in particular for the provision of prosthetics and orthotics devices to patients. In Rwanda, we observed that for all conditions (low back pain, clubfoot, and cerebral palsy), all type of social coverage, and regardless of the patient's home-distance from the service,

physiotherapy always represented a catastrophic health expenditure for in urban area in comparison to the level of CHE in rural areas (~23,050Rwf). Social coverage through the community-based health insurance (*Mutuelle*) appears to be the current best protection against financial risk for physiotherapy treatment in Rwanda (based on our calculations, see chapter 3)⁶, even if it is not enough for most of the patients. Prosthetics and Orthotics services are very expensive for the Rwandan population. Most of devices represented catastrophic health expenditure for all levels considered, national, rural and urban.

These estimations reveal that people with disabilities have to urge the government to take into consideration these facts and act to prevent households from financial risk due to P&O devices, and more generally for rehabilitation care. Social protection mechanisms are not enough to protect rehabilitation services' users from extreme poverty, and persons with disabilities have a “double penalty” as they belong to the poorest population and they have basic and specific health care needs due to their condition. Furthermore, a person with disabilities may have additional expenditures for her and her household due to her disability such as transportation, assistive devices or personal care (Mitra, Posarac, and Vick 2013).

2.3.Physical barriers

Literature underlined the limited availability of rehabilitation services, in particular in lower-income countries. This lack of rehabilitation services for people with disabilities is a significant barrier to access to care. People with disabilities have greater unmet needs than people without disabilities whereas people with disabilities report to seek more health care than people without disabilities (WHO Africa 2017).

Furthermore, people with severe disabilities have more difficulties to access to healthcare. A study conducted in Sri Lanka and Cameroon in 2015-2016 demonstrated this lack of health care and the difference of access for persons with severe disabilities (UNDESA 2018). Authors showed that the percentage of people with disabilities underserved in outpatients care settings increased with the severity of the disability. In Cameroon, people with severe disabilities have 50% more chance to have unmet needs for outpatient care, while in Sri Lanka they are 12 time as likely.

⁶ Without pretending that this applies to other countries

To address physical barriers linked to a lack of rehabilitation services, recommendation will be to develop promotion and prevention policies for health care including rehabilitation care to people with disabilities, particularly in communities in remote and rural areas. However, WHO noticed that activities of promotion and prevention for health rarely target people with disabilities (WHO Africa 2017).

Physical barriers are not just a lack of available services within a country or a region; it also refers to the availability of the right type of care to those who need it. This includes hours of waiting time that meet demands of those who would use care, as well as having the appropriate type of service providers and materials (Peters and al. 2008).

Other physical barriers are the uneven access to buildings (hospitals, health centers), inaccessible medical equipment, poor signage, narrow doorways, internal steps, inadequate bathroom facilities, and inaccessible parking areas create barriers to health care facilities. Moreover, within the people with disabilities environment, they can faced physical barriers such as inaccessible public transport, inaccessible facilities, or poorly paved road (Trani and al., 2017).

Physical barriers can be addressed through better public transportation, or urban improvements to facilitate mobility of people with disabilities. Additionally, health promotion and educational programs provided within the home of community may address the geographical barriers (Bright and al., 2017). A program has been developed in rural communities of Nepal in order to raise awareness and remove the physical barriers amongst communities. For instance they help to reconstruct healthcare centers to be more accessible for people with disabilities (Zero Project 2018).

2.4. Other barriers to access to rehabilitation care

2.4.1. Perception of general quality of care

According to Palmer and al. (Palmer, Donabedian, and Povar 1991) there is a distinction to be made between observed quality of care and perceived quality of care. The observed quality of care refers to the adherence of health care services to professional standards of care; while the perceived quality of care refers to the patients' perception of care received. Knowing the

perceived quality is essential for analyzing the demand for care, despite its subjectivity and that it may decline while at the same time there is an increase in objective quality.

Strategies that aim to improve health care quality will ensure that essential inputs (e.g. technology, operational facilities, pharmaceutical supplies and trained health workers) are in place (Bhutta and al. 2008). Thus, the measurement of the observed quality will focus on the supply side and aims to improve the provision of services in regards to clinical guidelines (Heiby 2014; Hanefeld, Powell-Jackson, and Balabanova 2017).

The perceived quality of a service is linked to the difference between patient's expectations and the reality, and thus how responsive health service providers are to the social and cultural expectations of individual users and communities (Peters and al. 2008).

Regarding the perceived quality, a study conducted by WHO, people with disabilities were “more than twice as likely to report finding health care provider skills inadequate to meet their needs, four times more likely to report being treated badly and nearly three times more likely to report being denied care” (WHO Africa 2017). Thus, causes of a bad service delivery in rehabilitation may be linked to human resources for health shortage, and shortage of qualified human resources. According to WHO, there are less than 10 skilled rehabilitation professionals per one million population in LMICs (WHO 2017c). The risk is linked to unqualified health workers, staff absenteeism, and opening hours. In addition, the lack of continuous training, low level of training, or training that are not corresponding to international standards, as well as the lack of motivation from the staff, the lack of professional opportunity, and inadequate behavior of human resources for health with persons with disabilities have for consequences, an important mistrust of persons with disabilities to health workers skills. Moreover, the quality perceived may be impacted by the waiting time in the service, and the late or no referral of patients (Jacobs and al. 2012). Smith and al. added that access to assistive technologies for people with disabilities living in lower-income countries is a challenge where only from 5 to 15% of people who need it has access to it, and one of the main reasons is the shortage of skilled professionals (Smith and al. 2018).

2.4.1. Discrimination and economic and social inclusion of persons with disabilities

Official recognition of interrelationships of disability with vulnerability factors (e.g. displaced populations with disabilities that may lead to double discrimination, disadvantages, and increase of existing barriers) (McVeigh and al. 2016)

Other factor of discrimination can be linked to the attitude of health workers to people with disabilities. Knowing that persons with disabilities are often left out from the society, particularly in low-income countries, they can face difficulties to understand the complexity of billing system. And, if there is a lack of transparency patients may be unable to know prices beforehand.

Another form of discrimination is linked to gender of the disability person. Studies have shown that women with disabilities are three times more likely to have unmet needs for health care, and higher chances to be excluded from rehabilitation services, than men with disabilities (UNDESA 2018; Wiklund and al. 2016).

3. Inadequate provision of rehabilitation: analysis of the supply side

3.1. Problematic of the rehabilitation workforce

Globally, the literature provided attention to the human resources shortage in developing countries, but few papers addressed the issue of the rehabilitation workforce. Indeed, according to Scheffler and al., there is a shortage of health workers worldwide; the largest needs are in South-East Asia, and Africa (Scheffler and al., 2016). The global deficit is estimated of about 12.9 million skilled health professionals by 2035 (Global Health Workforce Alliance and WHO 2014). Indeed, the crisis in health workforce is persistent and is due to a shortage of professionals, a mix of insufficient skills, and an unequal distribution of professionals (Ranson and al., 2010). In addition, barriers to achieve sustainable development goals related to human resources for health are a lack of health workers, an unevenly distribution of health workers and health facilities, a very low access to health services for the most vulnerable people, a low quality of care and inadequate health worker training, supervision and support (World Health Organization, 2018). These issues are highlighted for all human resources for health including those for rehabilitation care.

Rehabilitation includes a large spectrum of professions: physicians specialized in physical medicine and rehabilitation, physiotherapists (PTs), occupational therapists (OTs), speech therapist (STs), prosthetists/orthotists, associate prosthetists/orthotists, prosthetic/orthotic technicians, and PT/OT assistants, as well as other health workers and family supplying the population's rehabilitation needs (Gupta and al., 2011; ISPO, 2018). Additionally, there great differences in terms of existence, practices, education and competencies of rehabilitation workers across countries and inside a country (Jesus and al., 2017).

Estimation of health workforce shortage only includes midwives, nurses and physicians, and left out other essential health workforce including rehabilitation workers. There is usually negligence in health workforce studies as the rehabilitation workforce is mostly ignored by researchers and policymakers (Gupta and al., 2011). This is an issue as the consequence is very scarce data on this sector for these professionals at national and international levels, and thus a very low understanding of needs and priorities in low- and middle-income countries. Or, if countries will achieved the sustainable agenda, they have to address needs of populations living with non-communicable diseases, disability and older people, therefore it request to include all health professionals, including rehabilitation workers, in policies and programs (Sykes and al., 2014).

Jesus and al. (Jesus and al., 2017) studied human resources for health and rehabilitation in the literature according to the AAAQ framework : availability, accessibility, acceptability, and quality (Global Health Workforce Alliance and WHO 2014). First, in terms of the availability of the health workforce, they found shortcomings of the supply data as there is no specific database or no standards for data collection at national level; variability in determining supply requirements between countries; worst substantial needs-based shortages of rehabilitation workers in Sub-Saharan Africa, Asia and Latin America. They also identified that international migration seems to aggravate global inequalities according to a study on physiotherapists (Cornwall and al., 2016) as high-income countries hire professionals from low-income countries. For instance, Singapore reduces shortages of rehabilitation workers by recruiting in resource-poorer Asian countries (Jesus and al., 2016). Secondly, authors focused on the issue of accessibility of the health workforce. In low-income countries, people with disabilities often have difficulties to access to rehabilitation health workers (WHO and World Bank 2011), in particularly for those living in rural or remote areas, most frequent situation of the population in these countries. They added that rehabilitation care provide in non-hospital

facilities are less funded, less attractive for professionals financially and academically and therefore less available for people who need it (Tran and al., 2012). Thirdly, Jesus and al look at acceptability of the rehabilitation workforce that is an issue in low-income countries, mostly because some people particularly in rural areas may ignore rehabilitation care existence and its benefits. Finally, they considered that quality of care delivered. As we mentioned earlier, skills and practices of rehabilitation workers can greatly differ from one country to another and between practice locations within same country.

According to Jesus and al., the review of rehabilitation workforce literature highlights strengths, weaknesses, opportunities, and threats that authors have summarized in a SWOT analysis (Figure 4). Based on this analysis and barriers identified through the AAAQ framework, they underlined six rehabilitation workforce challenges that are interdependent: (1) monitoring supply requirements, (2) supply data sources, (3) ensuring the study of a whole rehabilitation workforce, (4) staffing underserved areas, (5) adapt policy option to different contexts, and (6) develop international solution within interdependent world.

Figure 4: SWOT analysis developed by Jesus and al. in aim to analyze rehabilitation workforce literature.

<p>Strengths</p> <ul style="list-style-type: none"> • Unmet needs for rehabilitation workers are broadly identified: e.g. more in low-income countries and in rural regions elsewhere. • Already existing initiatives report promoting culturally competent rehabilitation, such as for aboriginal communities in Oceania and rural communities in sub-Saharan Africa. • Existence of long-distance education and international clinical education/service placements, inclusively from higher to lower income countries. • Existing knowledge of initiatives and factors that influence/improve the recruitment and retention of rehabilitation health workers in rural or remote areas of some high-income countries. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • No agreed strategy to determine rehabilitation supply requirements. • Under-development of information systems for monitoring supply. • Absence of professional registration/licensing/regulation for rehabilitation workers in many countries. • Lack of a uniform classification for different rehabilitation competencies, practices and credentials. • Lack of training programs for educating qualified rehabilitation workers in low-income countries. • International migration seems to aggravate global inequalities, but it has been scarcely studied. • Lack of physically accessible sites, inadequate equipment, lack of transportation and lack of capacity of people with disabilities to afford rehabilitation services impede access. • Existing barriers (e.g. legal, lack of funding or stakeholders' awareness) that prevent access to rehabilitation care. • Coverage gaps typically affect more the socially vulnerable people with disabilities (under/uninsured, resource-poorest, belonging to disadvantaged race/ethnic groups, living in rural or remote areas). • Rehabilitation services delivered outside hospitals are typically less funded, less attractive to rehabilitation workers and thereby less accessible to people with disabilities.
<p>Opportunities</p> <ul style="list-style-type: none"> • Possibilities for a global scaling-up of some initiatives that aim to supply underserved areas with needed rehabilitation workers. • Locally tailored policy solutions and innovative service delivery models are increasingly used and tested to enhance access to rehabilitation in underserved areas. • Possible solutions to undersupply and inadequate skill-mix (e.g. shifting and sharing of competencies across rehabilitation workers and other health providers). • The study and development of the rehabilitation workforce can benefit from, and be integrated within, the recent advances in the field of Human Resources for Health toward universal health coverage. 	<p>Threats</p> <ul style="list-style-type: none"> • Complexity and heterogeneity on the composition of the rehabilitation workforce. • Variability of competencies and scope of practice within the same professional label across countries and some within the same country. • Oversimplification: e.g. studying, monitoring and developing specific professions, nationally and internationally, instead of a whole rehabilitation workforce—including how this is distributed by regions, sectors, service-levels, etc. • Low priority in the health agenda.

Source: (Jesus and al., 2017)

Additionally, Dieleman and Hilhorst argue that the influence of governance is undervalued in addressing the human resources for health crisis at country and global levels, including issues related to accountability, planning, implementation, monitoring, corruption and transparency (M. Dieleman and Hilhorst 2011). Therefore, health workforce, including rehabilitation workers, requires strengthening health governance and human resource systems in aim to make change within the health system (Kaplan and al. 2013). Some international framework already exist and may help to provide possible solutions applicable to rehabilitation workforce's challenges (Power and al. 2017) such as the Joint Learning Initiative , the Global Code of Practice on the International Recruitment of Health Personnel, or the Global Strategy 2030 on Human Resources for Health (Joint Learning Initiative 2004; WHO 2016a; 2010d).

3.2. Misalignment of external financing for health and rehabilitation

3.2.1. Dynamic of the international community to improve health financing

As seen in the first chapter of this thesis, the dynamic that aim to increase investments for development was launched in the early 2000s with the Millennium Development Goals (MDGs) has helped to stimulate the growth of the development assistance for health.

At the Millennium Summit in 2000, the 189 Member States adopted the Millennium Declaration in which the eight Millennium Development Goals were set out. MDGs are made of eight objectives targeting eight development areas and measuring the fight against income poverty, hunger, disease, lack of adequate housing and exclusion while promoting gender equality, health, education and respect for the environment. Three of these goals are related directly to health and two more have health components.

In 2001, heads of state of the African Union countries committed in the Abuja's Declaration to set a target of allocating at least 15% of their annual budget to improve the health sector. In parallel, they asked donors countries to meet their commitment to reach the target of 0.7% of their GNP as official development assistance to developing countries, and 0.15 to 0.20% for least developed countries (WHO 2011). This double request has brought to light the shortage of resources necessary to improve health in low- and middle-income countries.

Then, through the publication of the World Health Report (WHO 2010c), the concept of the universal health coverage (UHC) raised into the international community. In 2015, the

sentence was handed down; the MDGs have not led to more effective population health outcomes and were mostly not reached by low- and middle-income countries.

The Sustainable Development Goals (SDGs) were developed for the period 2015-2030. Objectives are broader than the MDGs, with 17 objectives and 169 target indicators. The target 3.8 refers to the concept of universal health coverage that is a promotion of a comprehensive and coherent approach to health, focusing on health systems. Challenges for countries are to develop their capacities in aim to improve their initial level of development. The UHC and the SDGs represent an ambitious strategy for the development and improvement of the health status of populations.

Reaching the universal health coverage (UHC) and sustainable development goals are dependent on adequate financing for health system around the world. Some authors call it the financing transition. “For many countries transitioning from a high dependence on DAH to a high functioning and self-sufficient government supported health system, a gap remains” (Institute for Health Metrics and Evaluation (IHME) 2018).

3.2.1. Comparative analysis of donor’s funding in rehabilitation and HIV/AIDS sectors, in relation to population needs

In the first section, we defined rehabilitation and we described main causes of disability that lead a person to seek for physical and functional rehabilitation care in low- and middle-income countries (LMICs). We found that non-communicable diseases (NCDs) are one of the most leading causes of disability in LMICs.

Rehabilitation is a transversal healthcare service that is hardly measurable in terms of level of funding. However, we can assume that if a particular effort is made in the direction of non-communicable diseases in terms of funding, it could have an indirect effect on rehabilitation demand. In addition, since several decades, there is little attention paid to non-communicable diseases, in relation to HIV/AIDS. We thus assume that expenses rose for NCDs projects in LMICs will be a good representative, as a proxy, of rehabilitation investments in these countries to be compared with HIV/AIDS investments. We first look at the global spending for health in general and for NCDs and HIV/AIDS, and secondly we observed evolution of development assistance for health worldwide, in LMICs and DAH for NCDs and HIV/AIDS.

Development assistance for health (DAH) corresponds to “financial and in-kind resources that are transferred through major health development agencies to low- and middle-income countries with the primary purpose of maintaining or improving health” (Institute for Health Metrics and Evaluation (IHME) 2018).

Funding sources of DAH are national treasuries, private philanthropies, and debt repayments to international financial institutions. The DAH is provided through different channels of assistance: bilateral development assistance agencies, the European Commission, United Nations agencies (UNFPA, UNAIDS, UNICEF, Unitaid, PAHO, and WHO), the World bank and regional development banks, the Global Funds to Fight Aids, Tuberculosis and Malaria (the Global Fund), Gavi, the Vaccine Alliance, foundations and non-governmental organizations. Development assistance for health is spent through governmental programs (national Ministries of Health, National disease control programs), and non-governmental programs (National NGOs, private sectors contractors, and universities and research institutions).

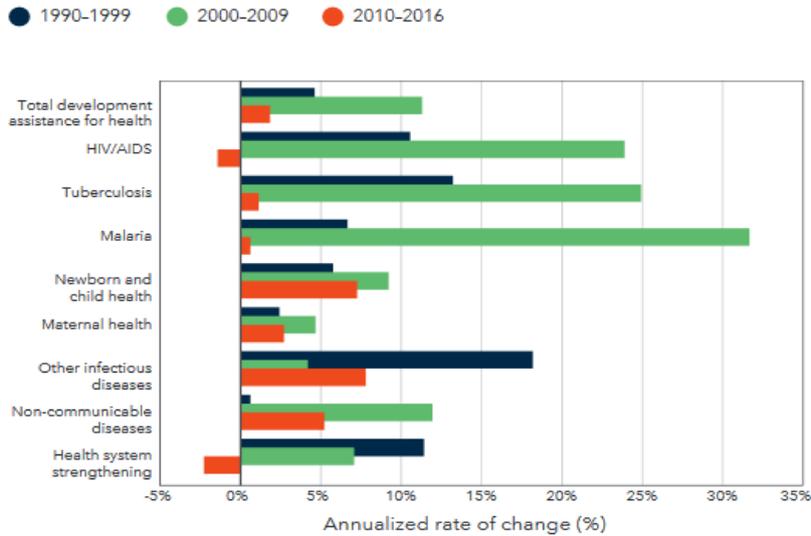
In 2017, the total amount of development assistance for health (DAH) provided to low- and middle-income countries to maintain or improve health reached \$37.4 billion (Institute for Health Metrics and Evaluation (IHME) 2018), and it represents a -0.3% change from 2016, in real value. Indeed, 26.4% of the official development assistance is dedicated to the health sector in 2016. This share of the DAH increased since the 90’s, with a growth of 4.6% from 1990 to 2000. The higher growth rate of DAH was from 2000 to 2010 and reached 11.4%; it was due to the creation of international organization, Gavi and the Global Fund, as well as the Millennium Development Goals dynamic.

The main beneficiaries of the increase in the development assistance for health (DAH) are low- and middle-income countries whose dependence on external financing has increased with the growth of health assistance. Indeed, there has been a larger increase for MDGs’ targets, and a shift away from aid to health systems strengthening. Studies have shown that the growth of DAH was the most important for malaria, tuberculosis, and HIV/AIDS. And, there has been an important increase in DAH flows but no significant increase in health outcomes for population in recipient countries.

In 2014 the DAH represented 0.6% of total health expenditures worldwide or almost one-third (35.7%) of total health expenditures of low-income countries. And from 2010 to 2017 we

observe a settled down with a low growth of 1.8% per year, including -1.8% growth for HIV/AIDS that is the broader target, it represents a loss of 100 million US\$ per year from 2010 to 2017 (figure 5). This decrease of the DAH occurs for maternal, newborn and child health too. This finding is quiet alarming considering that MDGs 4 and 5 have not been reached for the major part of countries. Therefore, there is still limited support for health systems strengthening, which is fundamental as past experience has shown such as the Ebola experience. The Ebola experience confirmed the risk of weak health system in case of unpredictable health shocks due to the poor resilience of healthcare systems of affected countries. Funding for health system strengthening was the most important over the period 1990-1999 (8.8%), then it roses to 7.1% over 2000-2009 while other sectors saw their funding increased (Institute for Health Metrics and Evaluation (IHME) 2018).

Figure 5: Growth in health aid by type of allocation, over the periods 1990-99, 2000-09, 2010-16



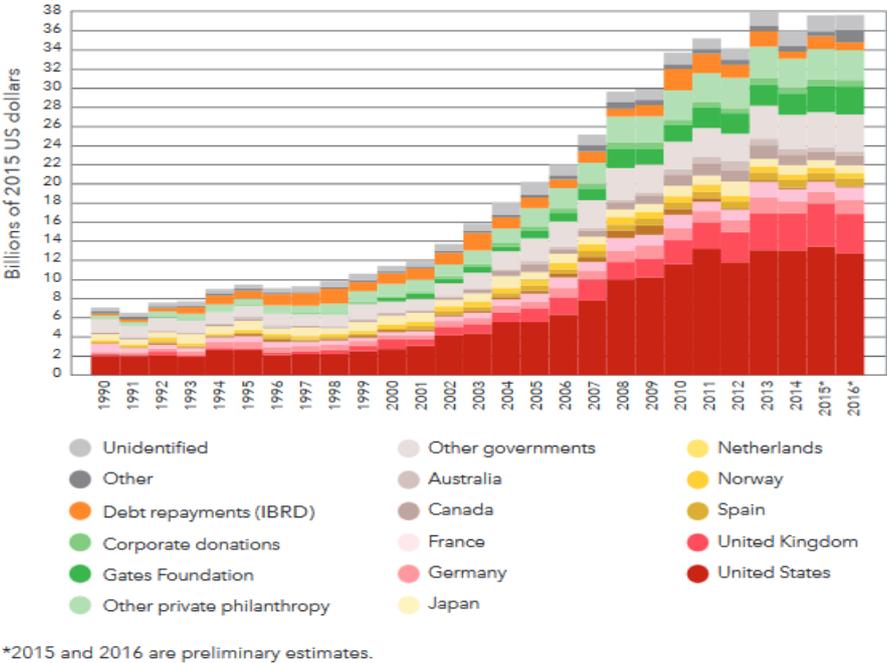
Source: (Institute for Health Metrics and Evaluation (IHME) 2018)

Authors estimated that if the 11.4% growth in DAH from 2000 to 2010 had continued from 2010 to 2016, an additional 82 billion US\$ would have been spent on improving the health sector over the past 6 years.

Moreover, from 1995 to 2014, nearly US\$ 423 billion of DAH has been transferred to low- and middle-income countries. The majority of DAH came from national treasury, including 34% from the United States, and 10.9% from the United Kingdom, as a % of total DAH in 2016 (Figure 6). In addition, the predominant shares of DAH are channeled through

multilateral development agencies such as the World Bank (5.1%) and WHO (5.8%), and private-public partnerships such as the Global Fund (9.9%) and Gavi (4.9%) in 2016.

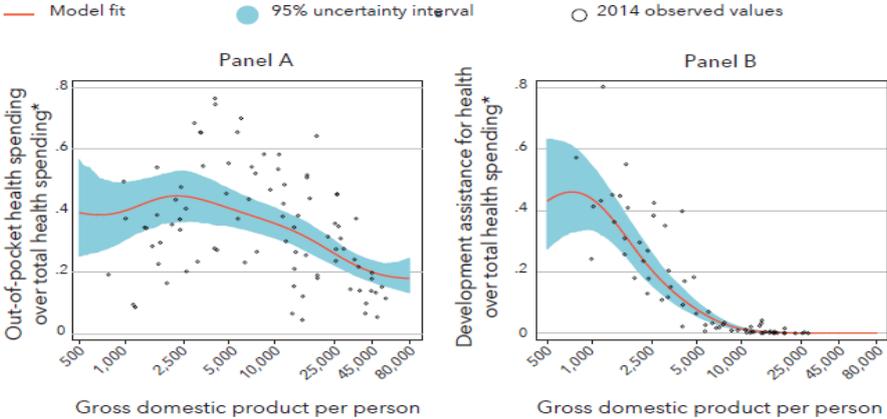
Figure 6: Evolution of the development assistance for health over the period 1990-2016, US\$ billion in 2015, by source of financing.



Source: (Institute for Health Metrics and Evaluation (IHME) 2018)

Figure 7 represents the share of direct payments or health costs borne by patients in total health expenditures and the share of DAH in total health expenditures regarding to the level of development of countries measured by the GDP per capita. On average, more countries are developed more they per capita spending on health are important, and more they decrease their dependence on DAH and thus gradually increase their dependence on public health expenditure (and possibly their dependence on direct payments from users, panel B). The most developed countries rely heavily on government spending to fund their healthcare system. In addition, less developed countries received slightly less amounts of DAH than countries with a higher GDP per capita closed to 801 US\$, in 2015. Same trend is observed over the period 1995-2014.

Figure 7: Share of direct payments in total health expenditures (Panel A) and Share of DAH in total health expenditures (Panel B), by level of development, 2015



*Spending is in 2015 purchasing power parity dollars. Source: Financing Global Health Database 2016

Source: (Institute for Health Metrics and Evaluation (IHME) 2018)

Dieleman and al. estimated future and potential spending on health from 2015 to 2040 (Dieleman and al., 2017). The projections of the DAH amount over the period 2015-2040 , based on past and present trends and with a wide confident interval, are around 64.4 billion US\$ (95% UI 30,4 billion US\$ to 161,8 billion US\$). Authors estimated that DAH is expected to increase only marginally by 2040. The share of DAH in total health expenditure was 0.6% in 2014, and is estimated at 0.4% in 2040. Therefore, it accounted for 35.7% of total health expenditure in 2014 for low-income countries and is estimated by the authors to represent 26.3% in 2040.

However, caution should be exercised when making these projections as key parameters may compromise the accuracy of these expenditure prediction models such as an international financial crisis, a rapid development of new technologies, the emergence of unpredictable epidemics such as Zika or Ebola viruses, or environmental changes and natural disasters. All these factors influence the creation and evolution of complex health systems, but also future health expenditures. These factors interact and make it difficult to predict the evolution of health expenditure (Dieleman and al., 2017).

Furthermore, according to the Røttingen, a government must spend the equivalent of 86US\$ per person and per year on health in order to ensure the provision of a minimum package of health services to its population (Røttingen and al., 2014). This estimation represents a

significant increase in comparison to the 2001 recommendations from the Commission on Macroeconomics and Health which recommended a target of 34US\$ per capita. This increase reflects the increase of prevalence of HIV/AIDS, tobacco or non-communicable diseases.

The aid sector should be taking a broader approach to diversity and inclusion, rather than attempting to "mainstream" one marginalized group at a time, according to Y. Daccord, Director General of the International Committee of the Red Cross (ICRC), during the Global Disability Summit in London in 2018 (Anders 2018). It is thus recommended to prioritize transversal and inclusive approaches instead of vertical approaches for marginalized group, such as persons with disabilities.

Gap between emergency and development assistance for health

Over the past decade, there is an evolution of public funding that conduct countries, which have traditionally greatly invested in development assistance, to focus their budgets on humanitarian aid, to the detriment of development aid, as a consequence of a decline of their financial resources. In addition, governments are increasingly connecting their humanitarian assistance with their political objectives, particularly the fight against terrorism.

Humanitarian aid aims to save lives and alleviate suffering during emergencies and post-emergencies situations. Development aid responds to structural issues, mostly linked to poverty, and provides a financial support of promoting the economic development and welfare of developing countries. In theory, humanitarian aid is short-term delivered in disaster zones, responds to an incident or event, whereas, the development aid is usually long-term, delivered in developing countries (Branczik 2004). However, these aids are linked as they represent a continuum of assistance, and sometimes, aid can comprise both humanitarian and development components. According to the Linking Relief, Rehabilitation and Development (Ramet 2012), some good practices exist and include: the necessity to have a close communication between humanitarian and development sector at the donor, institutional and project level and between these levels; and a need for greater efforts to eliminate unnecessary program silos.

3.2.2. Dependence of LMICs to external financing

Domestic financing sources can be public or private. Private sources included private insurance and out-of-pocket payments, and public sources include taxes and other mandatory, prepaid and pooled mechanisms structured by the government (Ottersen and al., 2017b).

There are remaining concerns about the possible influence of external donors on health policies implementation in recipient countries. Literature showed that ability of donor to influence priorities of policy makers in health mainly appears when there is considerable dependence of recipient countries on external funding (Khan and al. 2018). Other papers highlighted issues related to the dominance of donors in health policy in low- and middle income countries (Ollila 2005; Travis and al. 2004): “overshadowing of recipient countries’ existing programs and priorities, overlooking strengths and absorptive capacities of national health systems, and their ability to sustain gains once donor funding ends” (Khan and al. 2018).

In order to avoid reliance on external donors funding and the possible influence on health policy process, low- and middle-income countries should use multiple financing sources such as: domestic funding, overseas development assistance, development loans, engaging the private sector, innovative financing mechanisms, voluntary contributions, compulsory levies or taxes, or financial mechanisms and facilities (Allen 2017).

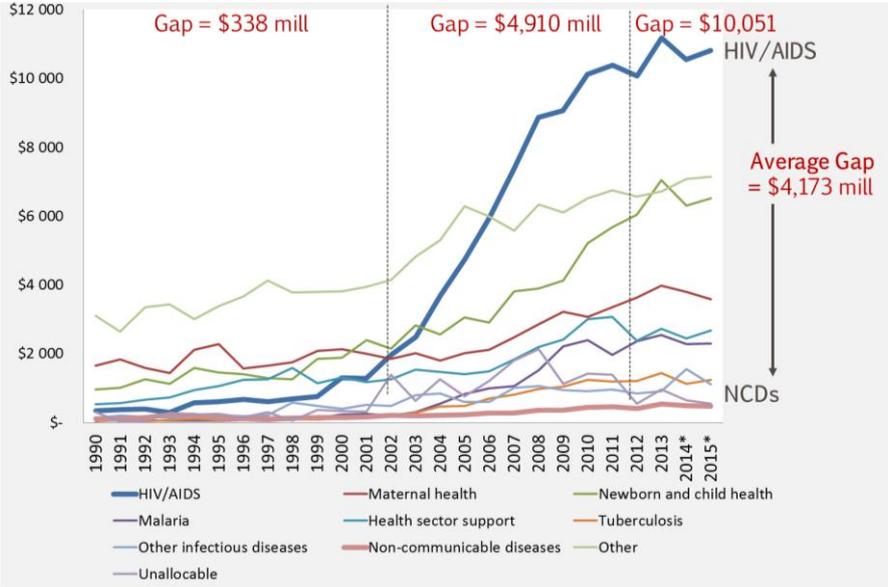
3.2.3. Effectiveness of development assistance for health: is DAH improving population health in recipient countries?

The overall relationship between DAH and health outcomes is uncertain and controversial. The total volume of DAH is currently inadequate and below the needs of low-income countries. But, increasing DAH in order to finance international goals such as the SDGs is not a sufficient solution to sustainably transform health systems. Indeed, a set of measures must be taken to improve the effectiveness and efficiency of development assistance for health.

However, recurrent criticisms occurred for the allocation of DAH. According to several studies, DAH allocation is weakly correlated with the overall burden of disease. Investments for the fight against HIV/AIDS have far exceeded investments for rehabilitation and disability or for health systems strengthening, which is the new priority of the international community. For instance, almost half (46.8%) of the DAH from 2002 to 2006 has been allocated to the

fight against HIV/AIDS, thus the 54.2% remaining for other public health problems and health systems strengthening. This high level of investment for HIV/AIDS may be explained by the strong lobbying in the 1980s around HIV, the large media coverage and social awareness and the creation of specific vertical programs to fight HIV/AIDS such as the Global Fund or UNAIDS. In addition, if we look at the global burden of disease that measures the burden of a disease using the disability adjusted life year indicator (DALY), we observe at the beginning of the 2000s, that HIV/AIDS accounts for 30% of DAH, and received 26% of specific funding which is well above its weight of around 6% of the total burden of disease. In comparison, if we look at the non-communicable diseases (one of the cause that lead a person to seek for rehabilitation care), we notice that this sector has received 23% of DAH, 0% of specific funding, while it represents 50% of the total burden of disease. Thus, there is a distended link between the materiality of facts and the attention given to the health problem, as shown in the figure 8.

Figure 8: Development assistance for health by health focus area, in millions of 2015 USD, 1990-2015



Source: Author, adapted from (Institute for Health Metrics and Evaluation (IHME) 2016)

Otherwise, it has been demonstrated in the literature that development assistance is biased for countries with lower population size. Countries with large populations tend to receive less development assistance. Fielding (Fielding 2011) identified that population size was negatively correlated with DAH per capita in 1995-2006, and 1% increase of population size is associated a reduction of DAH per capita between, -0.1% and -0.3%. Martinsen and al.

(Martinsen and al., 2018) analyzed the effect of the population size on the receipt of development assistance for health (DAH) per capita, and founded similar results. They highlighted the “small country bias” for DAH per capita (in 2015 US\$), and they found that there is a significant effect of population size on the amount of DAH per capita countries received (a 1% larger population size is related with a 0.4% lower per capita DAH between countries, and 2.3% lower per capita DAH within countries). They thus recommend including ‘population size’ in discussions for the allocation of DAH in aim to improve the equitable access to healthcare and health aid effectiveness. No conclusion can be extracted whether low population size is the cause of greater DAH per capita.

3.3.Financing issues through domestic health and rehabilitation funding

Government health spending corresponds to the “spending for health care that is derived from domestic sources and is mutually exclusive from out-of-pocket, prepaid private, and Development assistance for health spending. Government spending includes spending on public health system infrastructure and government-provided social health insurance” (Institute for Health Metrics and Evaluation (IHME) 2018).

Ottersen and al. (Ottersen and al., 2017a) proposed two complementary targets for government spending on health towards the universal health coverage objective. These targets should be reachable by middle-income countries without external financing. They suggested that every government should spend at least 5% of Growth Domestic Product (GDP) on health and ensure government health expenditures per capita of at least \$86. Another useful target is the indicator defined by heads of state of African Union countries in 2001. They set a target of allocating at least 15% of their annual budget to improve the health sector (WHO 2011). These targets are useful for policymaking, and a large majority of LMICs are currently below these targets. However, this indicator should be used with caution as depending on the level of GDP, great variations of expenses can occur.

According to the World Bank’s data for the year 2016 (World Bank 2016b), in low- and middle-income countries, the average public health expenditure as a share of the GDP was about 2.68%, and 1.5% in low-income countries, while it was about 10.02% in high income countries, which is higher than the 5% target defined by Ottersen and al, see above. Neither sub-Saharan Africa countries nor South Asia countries reached the target in 2016 with public

health expenditure as a share of the GDP which was respectively about 1.82% and 0.91% in 2016. As well as our case studies, Rwanda and Cambodia that did not reach the target either: 1.33% in Rwanda, and 2.29% in Cambodia.

The second target proposed by Ottersen and al. (“ensure government health expenditures per capita of at least \$86”) is, on average, largely reached by middle-income countries with around 287.31\$, but this indicator is only 25.61\$ in low-income countries, which is very far from the target. There is thus a huge gap between countries and populations from poorer countries are not properly covered by social protection mechanisms, if they exist and thus, they face a high risk of catastrophic health expenditures.

For rehabilitation, there is no information of specific budget dedicated to these care in low- and middle-income countries, as well as high-income countries. However, in Cambodia (see chapter 3), and as estimated by a non-governmental organization ICRC (Verhoeff 2014), the public body in charge persons with disabilities, PWDF, contributed to 33.85% on average to physical rehabilitation centers operating costs and the rest, the two-third, is financed by international organizations such as ICRC or Humanity & Inclusion.

4. General context of supply and demand side of rehabilitation

4.1. Governance in health and rehabilitation systems

Health system governance and the proper functioning of institutions in low- and middle-income countries (LMICs) have recently become one of the key themes of the international community's development strategy for these countries. Indeed, leadership and governance is one of the six building blocks of the health system, as defined by the World Health Organization (WHO 2007). Rehabilitation components within the health system and in relation to the building block “leadership and governance” are the following: “laws, policies, plans and strategies that address rehabilitation”, “governance structures, regulation mechanism and accountability processes that address rehabilitation”; and “planning, collaboration and coordination processes for rehabilitation” (Kleinitz 2018).

4.1.1. Governance in healthcare systems

A complex definition of governance

In recent years, governance has become a central component of the global strategy for international development, moving from microeconomic attention through project implementation, to a macroeconomic attention through policy development (McVeigh and al., 2016). However, even if governance impacts on all health system functions, it is one of the least understood components of health systems (Sameen Siddiqi and al., 2009).

It is important to underline that governance is not just about the government but it is also the overall responsibility of the community at macro level. The concept of governance in health systems is recent and no consensus exist about the definition or the measure of governance (WHO 2014a). In a broad sense, governance corresponds to “the actions and means adopted by a society to promote collective action and deliver collective solutions in pursuit of common goals” (Mikkelsen-Lopez and al., 2011). Understanding governance is also understanding how power is distributed between institutions, the exercising of authority, as well as the various means, rules, and institutions by which citizens or groups “articulate their interest, mediate their differences and exercise their legal rights and obligations” (Yeoh and al., 2019).

According to Siddiqi and al., health system governance includes all actions taken by the society to organize it and promote health of its population. Governance has an impact on the entire health system, and is a key determinant of economic growth, social advancement, and overall development in low- and middle-income countries (S Siddiqi and al., 2009).

Functions of governance

Governance functions are understood to describe the “specific efforts and process that are applied to steer the system” (Tang and al., 2014). According to WHO, governance functions are the following: formulating policy and strategic plans, generating intelligence, putting in place levers or tools for implementing policy, collaboration and coalition building, and ensuring accountability (Table 5).

Table 5: Functions of health systems governance according to WHO.

Functions	Details
Formulating policy and strategic plans	Development, implementation, and review of national health policies, strategies, and plans national governance strategies and plans.
Generating intelligence	Generating and using data on financial catastrophe and impoverishment; health budgets and expenditure; donor commitments and disbursements.
Putting in place levers or tools for implementing policy	Design of health system organizational structures and their roles, powers, and responsibilities; design of regulation; standard setting; incentives; enforcement and sanctions.
Collaboration and coalition building	Including across sectors and with external partners.
Ensuring accountability	Putting in place governance structures, rules, and processes for health-sector organizations; mechanisms for independent oversight, monitoring, review, and audit; transparent availability and publication of policies, regulations, plans, reports, accounts, etc.; and openness to scrutiny by political representatives and civil society.

Source: Adapted from (WHO 2014a) WHO, 2014; Yeoh and al., 2019

Yeoh and al studied the literature in aim to highlight the key functions of governance and identify how governance functions facilitated progress toward universal health coverage in the Asia-Pacific region. They thus found a core set of concept: ability to make plans and set priorities, ability to generate intelligence and/or monitor system performance, and accountability arrangements (Yeoh and al., 2019).

Authors found that governance functions that facilitate progress toward universal health coverage (UHC) included political commitment; leadership and support from politicians and civil servants; good stakeholder engagement; regulatory, political, and institutional structures to support policy implementation; and systems for monitoring and evaluation (Yeoh and al., 2019). However, authors also identified some barriers to UHC: develop policies and management strategies that work in both urban and rural areas, poor monitoring and evaluation, and lack of oversight.

What good governance within health systems means?

According to WHO, good leadership and governance imply the existence of a strategic legal framework in parallel to an effective oversight, coalition building, provision of incentives, appropriate regulation, and a particular attention to system design and transparency. The good governance, based on WHO definition, will thus be focus on policy and this include the inclusion of all actors involved in the health system, all incentives that influence or regulate

the system and stakeholders behaviors. The good governance will also follow transparent rules overseen by strong accountability links (Mikkelsen-Lopez and al., 2011).

The good governance of a health system commonly means the strengthening of the system, which included a qualitative and quantitative provision of health services for the population and a significant improvement in the health status of the population (Lewis and Pettersson, 2009; McVeigh and al., 2016; S Siddiqi and al., 2009). In addition, Lewis and Pettersson showed that improving health outcomes through efforts in the effective delivery of health services, can be driven by a good governance that will significantly improve the performance of the health system (Lewis and Pettersson 2009).

Some authors proposed a framework for assessing good governance in health system (Brinkerhoff and Bossert, 2008; Lewis and Pettersson, 2009; Sameen Siddiqi and al., 2009). But a more comprehensive framework of the good governance was developed by the United Nations Development Program that defines 8 main indicators: participation, rule of law, transparency, accountability, equity, efficiency and effectiveness, responsiveness, and consensus orientation. A good governance system is supposed to be linked with the resilient concept, thus in this aim a government should implement short-term and ad hoc measures, medium- and long-term strategies in order to address institutional weakness.

Governance and social protection

In high-income countries, it is clear that social protection objective is a contested process that needs political skill to lead population to support government decisions such as spending of tax-funded resources for the protection of vulnerable people (e.g. poor, older people, children, persons with disabilities, ...).

The civil society has pivotal roles to play for the good governance of social protection programs: role of delivery mechanisms for policy goals determined by policymakers; role to demand accountability from providers, and advocacy role to the government to develop, invest and implement policies (Norton and al., 2001).

Holmes and Lwanga-Ntale identified three important key elements in the governance framework of social protection literature (Holmes and Lwanga-Ntale 2012): institutional capacity and institutional coordination at national and decentralized levels; transparency and accountability mechanisms; and legal and regulatory frameworks.

Authors highlighted weakness of institutional capacity to design and deliver social protection programs, in particular in conflict and fragile countries. Another concern is the difficulty faced by donors in charge of social protection activities/programs to handover to the government in long term. It required that donor have an exit strategy at the beginning of their project(s) (Devereux and White 2010; Hickey 2007; Temin 2008). In terms of institutional coordination, the African Union suggests to integrate social protection programs directly in national development strategies and include, ideally, all short-term donors projects, under a national program that can be sustained, monitored, and followed over time (Holmes and Lwanga-Ntale 2012).

The literature raised three levels of transparency and accountability mechanisms in the social protection sector: national administrative level, level of delivery, and beneficiary level. According to Brown (Browne 2014), there is little evidence on effective impact of accountability mechanisms on social protection programs, literature mainly focused on best practices, lessons learned and principles of accountability. The aim will be to understand how accountability tools of social protection programs or projects work and how are they effective. Browne added that most accountability tools are considered to be effective in the policy and pragmatic literature (Table 6).

Table 6: Common accountability tools used for social protection programs

Accountability tools	Details	Effectiveness
Grievance redress mechanisms (GRM)	Formal channels through which beneficiaries can register complaints.	Mixed evidence on their effectiveness: some programs resolve all complaints and some resolve very few. GRMs generally achieve internal program accountability and not broader social accountability.
Social audits	Allow beneficiaries and communities to review and provide feedback on program implementation.	Evidence from effectiveness of an Indian social audit that improve the program implementation through significant improvements in levels of awareness among beneficiaries (Giannozzi and Khan 2011).
Audits	Most commonly used to oversee financing and ensure appropriate use of financial resources.	Little explicit evidence on whether these have increased accountability. There is also a strong assumption in the literature that changes do occur due to audits.
Citizen report cards (1) and community scorecards (2)	(1) Provide quantitative feedback on user perceptions on the quality, adequacy, and efficiency of public services; (2) qualitative monitoring tools used for local level monitoring and performance evaluation by communities.	Strong evidence on their effectiveness at improving services, and little on their effectiveness at improving social protection programs.
Rights and obligations	Some programs adopt a rights-based approach, which provides broader social accountability from state to citizens.	Evidence that social protection programs have improved perceptions of the state and strengthened citizen-state ties
Spot checks	Many social assistance programs use these rapid evaluations.	No evidence on how this specifically enhances accountability or performance
Performance-based incentives	Providing additional funding based on results might improve performance.	No information on improving accountability, but evidence on improved program performance.
Database crosschecks	These examine whether information on beneficiaries matches information from other public databases.	Improves beneficiary targeting accuracy and therefore program performance, but no studies explicitly discussing evidence of impacts on accountability.
Local-level politics	Local governments and local representatives are responsible for providing social assistance; they are likely to be held accountable through elections.	Some evidence that mayors in charge of an effective social assistance program may be re-elected. It may encourage first-term representatives to prioritize safety nets, which leads to good management practices.
Informal feedback	Many beneficiaries' main interaction with program in the form of informal conversations by program staff.	Unclear to what degree these conversations have impact on program implementation, or whether feedback is carried higher up the chain of command.

Source: Adapted from Browne, 2014.

In relation to legal and regulatory frameworks, the African Union advocate for legislation and regulation that will lead development, implementation and monitoring of the social protection program to be in line with governments' strategies and all parties' commitment (Holmes and Lwanga-Ntale 2012). Moreover, even if it seems to be a consensus in the international community about the importance of having legal and regulatory frameworks for these programs, there are little papers discussing how countries may move towards this theory in practice.

Typology and importance of corruption in health sector

Various definitions of corruption exist within the literature; it reveals a complex concept that needs to be clarified. According to the International Monetary Fund, the corruption is defined as “the abuse of public office for private gain” (IMF 2016). This definition is used by various public institutions and civil society organizations. However, a broader approach defines corruption as “the abuse of public or private office for personal gain. It includes acts of bribery, embezzlement, nepotism or state capture. It is often associated with and reinforced by other illegal practices, such as bid rigging, fraud or money laundering”(OECD 2014).

In the health sector, corruption is a pervasive problem and there is growing evidence of the negative effects on health status and social welfare (Vian 2007). And, due to uncertainty, asymmetric information, and the number of actors involved in health systems, there are larger opportunities for corruption (W. Savedoff 2006) that make difficult to ensure transparency and accountability. Another factor is the volume of money involved that make this system more vulnerable to corruption, as these funds represent an attractive target for corrupt behavior. Moreover, Savedoff made a difference between systemic and incidental corruption in health systems. The risk of corruption varies from one country to another because risks are dependent on characteristics of the health system, and context of the country (W. Savedoff 2006).

Within the health sector, risk of corruption is high due to the unpredictable demand of health services, dispersed actors that interact together in complex ways, and the asymmetric information among actors that make difficult identification, monitoring and control of interests (W. Savedoff 2006). In her paper, Vian identified 7 areas or process of corruption health sector: Construction and rehabilitation of health facilities, purchase of equipment and supplies, including drugs distribution and use of drugs and supplies in service delivery regulation of quality in products, services, facilities and professionals education of health

professionals medical research provision of services by medical personnel and other health workers (Vian 2007). Details of each area are described in Table 7.

Table 7: Types of corruption in the health sector

Area or process	Types of corruption and problems	Results
Construction and rehabilitation of health facilities	Bribes, kickbacks and political considerations influencing the contracting process Contractors fail to perform and are not held accountable	High cost, low quality facilities and construction work Location of facilities that does not correspond to need, resulting in inequities in access Biased distribution of infrastructure favoring urban- and elite-focused services, high technology
Purchase of equipment and supplies, including drugs	Bribes, kickbacks and political considerations influence specifications and winners of bids Collusion or bid rigging during procurement Lack of incentives to choose low cost and high quality suppliers Unethical drug promotion Suppliers fail to deliver and are not held accountable	High cost, inappropriate or duplicative drugs and equipment Inappropriate equipment located without consideration of true need Sub-standard equipment and drugs Inequities due to inadequate funds left to provide for all needs
Distribution and use of drugs and supplies in service delivery	Theft (for personal use) or diversion (for private sector resale) of drugs/supplies at storage and distribution points Sale of drugs or supplies that were supposed to be free	Lower utilization Patients do not get proper treatment Patients must make informal payments to obtain drugs Interruption of treatment or incomplete treatment, leading to development of anti-microbial resistance
Regulation of quality in products, services, facilities and professionals	Bribes to speed process or gain approval for drug registration, drug quality inspection, or certification of good manufacturing practices Bribes or political considerations influence results of inspections or suppress findings Biased application of sanitary regulations for restaurants, food production and cosmetics Biased application of accreditation, certification or licensing procedures and standards	Sub-therapeutic or fake drugs allowed on market Marginal suppliers are allowed to continue participating in bids, getting government work Increased incidence of food poisoning Spread of infectious and communicable diseases Poor quality facilities continue to function Incompetent or fake professionals continue to practice
Education of health professionals	Bribes to gain place in medical school or other pre-service training Bribes to obtain passing grades Political influence, nepotism in selection of candidates for training opportunities	Incompetent professionals practicing medicine or working in health professions Loss of faith and freedom due to unfair system

Medical research	Pseudo-trials funded by drug companies that are really for marketing Misunderstanding of informed consent and other issues of adequate standards in developing countries	Violation of individual rights Biases and inequities in research
Provision of services by medical personnel and other health workers	Use of public facilities and equipment to see private patients Unnecessary referrals to private practice or privately owned ancillary services Absenteeism Informal payments required from patients for services Theft of user fee revenue, other diversion of budget allocations	Government loses value of investments without adequate compensation Employees are not available to serve patients, leading to lower volume of services and unmet needs, and higher unit costs for health services actually delivered Reduced utilization of services by patients who cannot pay Impoverishment as citizens use income and sell assets to pay for health care Reduced quality of care from loss of revenue Loss of citizen faith in government

Source: Vian, 2007

Tomini observed in her study that the transition from a central model to progressive decentralization conducted to a high number of human resources for health with low salaries, as well as a decrease of public health funding and poor governance. Consequently, corruption was important and mainly through informal payments, and healthcare issues for the population rose such as difficulties to access to health services and high out-of-pocket payments (Tomini 2011).

The European Commission pointed out the corruption in the health sector through three main areas: informal payments, medical devices, and drugs. Informal payments can have several forms, and asked by different people for different reasons and at different times to all patients groups, regardless to their socio-economic status. However, the main reasons that conduct a person to initiate informal payments are the expression of gratitude and better quality of healthcare provision, and quicker access. Informal payments can be paid in cash, in kind or in a service, and can be perceived as a negative transaction if the payment is requested by the health professional, or positive if it is proposed by the patient as an expression of gratitude (European Commission 2013). Regarding medical devices, the corruption appears throughout all the supply chain and this is mainly due to the asymmetry of information existing mainly at manufacturers' level. The last main area is drugs but it does not concern our field of analysis, physical and functional rehabilitation.

Other risk of corruption in healthcare is linked to financing mechanisms. Indeed some of them may have a higher risk of corruption within the health system, according to the European Commission and Transparency International (European Commission 2013). Transparency International created a list of financing mechanisms according to their risk of corruption, see Table 8.

Table 8: Characteristics and corruption risks of selected financing mechanisms for health

Financing	Characteristics	Corruption risk
Taxes	Often associated with (almost) free services deliveries.	Important diversion of public funds at government level. High risk of informal payments. Corruption in procurement. Various abuses that decrease the quality of services.
Social insurance	Compulsory, and applicable for formal employees, with premiums and benefits described in social contracts according to laws or regulations.	Excessive medical treatment, fraud in billing, and diversion of funds.
Private insurance	Voluntary for any person who want to subscribe it as an individual or a group.	Risk selection (of a majority of healthy people) Excessive medical treatment, fraud in billing, and diversion of funds.
Out-of-pocket payments	Direct payments made by patients to healthcare providers for goods and service at the time of service us. It excluded prepayment for health services, and it is net of any reimbursements to the person who made the payments.	With often weak regulatory capacity there is a high risk of overcharging and inappropriate use of services.

Source: Transparency International, The European Commission (European Commission 2013)

Potential impact of corruption on the healthcare system

According to the European Commission, the impact of corruption in healthcare on society and people can be higher than the volume of money involved. Authors (European Commission 2013) have listed the potential effects of corruption on health systems that are impacts on :

- the price of equipment and drugs that are above the market;
- a lower quality of the provision of healthcare services, pharmaceuticals or medical devices;
- access to services and thus equity of access;

- health budget through a non-optimal allocation of funding;
- other public budget due to development and implementation of legal framework against corruption;
- market distortions such as “bad doctors driving out good doctors, bad suppliers driving out good suppliers, etc.”;
- society through possible loss of productivity due to poor health or distrust in the health system; and cross-border impacts such as brain drain of human resources for health, or increase of black market transactions.

According to Lee and al. (Lee and al., 2016), a major part of recipient countries from the official development assistance (ODA) often face a weak governance that is pointed out as one explanation of difficulties to achieved objectives. They examined if corruption control and democratic accountability, two dimensions of governance, have an impact on the effectiveness of the ODA for HIV/AIDS. They found that aid programs should be implemented in recipient countries that have improved their governance, and there is a lack of attention in democratic accountability whereas it is a priority for the effectiveness of programs. Therefore, corruption may impact effectiveness of program that aim to improve health status within a given country.

How do events may impact institutions' governance?

According to Lebel and al., the resilience of the health system corresponds to its capacity to absorb, adapt and transform when it is exposed to a shock (e.g. natural disaster, pandemic, armed conflict, ...) and to keep the same control on its structure and functions (Lebel and al., 2006). A country that is able to manage the resilience of its health system means that it is in capacity to manage actors, networks and institutions involved in the system (Blanchet and al., 2017). Thus, it is very important to strengthen the capacity of health system to manage its resilience for the well-being of population and society.

Authors developed the four dimensions related to the management of resilience of health systems: (1) capacity to collect, integrate and analyze different forms of knowledge and information; (2) ability to anticipate and cope with uncertainties and surprises; (3) capacity to manage interdependence: to engage effectively with and handle multiple- and cross-scale dynamics and feedbacks; and (4) capacity to build or develop legitimate institutions that are socially accepted and contextually adapted. Blanchet and al. added three levels of resilience to these four dimensions that are absorptive capacity, adaptive capacity and transformative

capacity (Blanchet and al., 2017; Lebel and al., 2006). This theoretical framework should lead to an effective resilience of the health system.

Policies and good practices to fight against corruption in health systems

There is a consensus among international community that an effective strategy to fight against corruption will required a combination of policies and practices within a multifaceted approach (European Commission 2013; IMF 2016). Policies and practices should aim to address weakness of the health system, society should have change of population mentalities to massively reject corruption, and it requires specific anti-corruption in healthcare policies and practices (European Commission 2013).

There is evidence of existing interventions that reduced corruption. Gaitonde and al. highlighted that interventions included “improvements in the detection and punishment of corruption, especially efforts that are coordinated by an independent agency, guidelines that prohibit doctors from accepting benefits from the pharmaceutical industry, internal control practices in community health centers, and increased transparency and accountability for co-payments combined with reduced incentives for informal payments” (Gaitonde and al., 2016). Authors also found that interventions depend on political commitment for their success.

Transparency has an important role to play within anti-corruption policies (IMF 2016). It can ensure efficient allocation of resources; promote good governance by discouraging illicit behavior. Some studies demonstrated a positive relationship between corruption and a lack of public budget transparency, more transparency in a public budget is thus associated with less corruption perceived (de Renzio and Whener 2015; Sedmihradská and Haas 2012). Moreover, a lack of budget transparency increases information asymmetry and voters’ confusion; it thus reduces politicians’ commitment to be fiscally responsible (Benito and Bastida 2009). In addition Rios and al. demonstrated that legislative budgetary oversight has a positive influence on budget transparency (Ríos and al., 2016).

A potential strategy to fight corruption is to address malfunction of health system as it can fuel the corruption. Major improvements should address structural issues of the system: ineffective managerial structures, inappropriate financing mechanisms, insufficient healthcare capacity, insufficient funding for independent medical research, or unequal allocation of resources (European Commission 2013).

The legislation or legal framework seems to be one of the most important tools to fight corruption. In addition, the compliance of countries with international anti-corruption standards developed by the United Nations, the Organization for Economic Co-operation and Development (OECD), or the Group of States against Corruption (GRECO) is important for the healthcare sector (European Commission 2013).

4.1.2. Rehabilitation and governance

Mannan and MacLachlan recognized that disability and health are a transversal topic from “illness, disease and rehabilitation to wellbeing, positive living and empowerment” (Mannan and MacLachlan 2013), thus health research has to adapt to complexity of health and be much broader. In addition to governance issues existing in the healthcare system, as described previously, rehabilitation and disability’s application in is complex and challenging. But, this particular dynamic of rehabilitation and disability provides the opportunity to innovate in leadership and governance (McVeigh and al., 2016). McVeigh and al., added that the innovation should be done through a participative, transparent and well defined and structured framework.

We often observed in low- and middle-income countries, management of rehabilitation care is not under the supervision of the Ministry of Health (e.g. under the Ministry of Social Affairs), and thus rehabilitation care are often excluded from the health system, including health policies and reforms. This distinction between rehabilitation and health is visible also within functioning of organization such as Humanity & Inclusion, a French non-governmental organization (NGO). Indeed, in 2017 this NGO developed 94 rehabilitation projects in 49 countries, and 76 distinct health projects have been carried out in 40 countries (Humanity & Inclusion 2019), and nourish this distinction through the intern leadership within the organization.

In their study and based on their findings, McVeigh and al. made a set of recommendations to promote good policy for leadership and governance of health related rehabilitation (McVeigh and al., 2016). Their 5 main suggestions are: (i) a meaningful participation of people with disabilities in the policy process to improve program responsiveness, efficiency, effectiveness, and sustainability, and to strengthen service-user self-determination and satisfaction; (ii) collection of disaggregated data on rehabilitation and disability as well as the development of health management system for rehabilitation, in order to support political

momentum, decision-making of policymakers, evaluation, accountability, and equitable allocation of resources; (iii) explicit promotion in policies of access to services for all subgroups of persons with disabilities and service-users to support equitable and accessible services; (iv) develop robust inter-sectoral coordinating mechanisms to cultivate coherent mandates across governmental departments regarding service provision; and (v) institutionalizing programs by aligning them with preexisting Ministerial models of healthcare in aim to support sustainability of program.

In its “Rehabilitation 2030, a call for action” (WHO 2017c), participants of the meeting acknowledge that governance and leadership of the rehabilitation sector should be strengthened. They highlighted several barriers to strengthen and extend rehabilitation in countries. First, there is an under prioritization of rehabilitation by government amongst competing priorities; there is an absence of rehabilitation policies and planning at the national and sub-national levels; where both ministries of health and social affairs are involved in rehabilitation there is limited coordination between them; there are non-existent or inadequate funding; there is a lack of evidence of met and unmet rehabilitation needs, there are insufficient number of trained rehabilitation professionals, there is a lack of rehabilitation facilities and equipment, and a lack of integration of rehabilitation into health systems.

In view of the above, authors of this call for action proposed a set of actions to strengthen this sector. They recommended creating strong leadership and political support for rehabilitation at sub-national, national and global levels; strengthening rehabilitation planning and implementation at national and sub-national levels; improving integration of rehabilitation into the health sector to effectively and efficiently meet population needs; incorporating rehabilitation in the Universal Health Coverage; building comprehensive rehabilitation service delivery models to progressively achieve equitable access to quality services, including assistive products, for all the population; developing a strong multidisciplinary rehabilitation workforce that is suitable for country context, and promoting rehabilitation concepts across all health workforce education; expanding financing for rehabilitation through appropriate mechanisms; collecting information relevant to rehabilitation to enhance health information systems including system level rehabilitation data and information on functioning utilizing the International Classification of Functioning, Disability and Health; building research capacity and expanding the availability of robust evidence for rehabilitation;

establishing and strengthening networks and partnerships in rehabilitation, particularly between low-, middle- and high-income countries.

In 2018, WHO developed the STARS or the Standard Assessment of Rehabilitation Systems (Kleinitz 2018). In this assessment, a country will have a satisfying level of governance if it reaches the following targets: (i) rehabilitation policies and plans are formulated; the levers for rehabilitation policy and plan implementation function well; (iii) There is accountability and transparency across rehabilitation; (iv) There is adequate regulation of the sector; (v) There is collaboration and coalition building; (vi) Evidence and intelligence is utilized to inform decision making.

4.1.3. Global health priorities and rehabilitation

“Global health priorities have in recent years been defined through several processes and by several actors and at various forums” (Ollila 2005). Most popular priorities are related to the beginning of the worldwide awareness for development with the Millennium Development Goals (MDGs), adopted by the United Nations General Assembly in 2001. The MDGs contained 8 goals, including 3 that focused on health: child mortality, maternal health and HIV/AIDS, malaria and other. The MDGs do not take into account specific population targets such as persons with disabilities. This is mainly due to a lack of advocacy from the international community.

However, on January 1st 2016, the Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development officially came into force (United Nations 2015). With these new 17 goals, there is a try to mobilize efforts to end all forms of poverty, fight inequalities and climate change, while ensuring that no one is left behind worldwide. Unlike the MDGs, efforts have been made to develop the SDGs with the cooperation of civil society from many areas in order to target almost all public issues. Thanks to persistent, strategic and coordinated advocacy, there are 11 references to persons with disabilities in the 2030 Agenda, mostly included in “vulnerable persons” expression. The Danish Institute for Human Rights (DIHR), in collaboration with the International Disability Alliance, developed a matrix that link relevant provisions of the UN Convention on the Rights of Persons with Disabilities (CRPD) with relevant SDGs. This tool intends to be used by policy makers and all persons working on issues that focus on persons with disabilities (DIHR 2018). For instance, the target 3.8 “Achieve universal health coverage, including financial risk protection, access to

quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.” is linked to the article 25 of the CRPD, as described in the Box 1.

Box 1: Article 25 of the CRPD

25. States Parties recognize that persons with disabilities have the right to the enjoyment of the highest attainable standard of health without discrimination on the basis of disability. States Parties shall take all appropriate measures to ensure access for persons with disabilities to health services that are gender-sensitive, including health-related rehabilitation. In particular, States Parties shall:

a) Provide persons with disabilities with the same range, quality and standard of free or affordable health care and programs as provided to other persons, including in the area of sexual and reproductive health and population-based public health programs;

b) Provide those health services needed by persons with disabilities specifically because of their disabilities, including early identification and intervention as appropriate, and services designed to minimize and prevent further disabilities, including among children and older persons;

c) Provide these health services as close as possible to people’s own communities, including in rural areas;

d) Require health professionals to provide care of the same quality to persons with disabilities as to others, including on the basis of free and informed consent by, inter alia, raising awareness of the human rights, dignity, autonomy and needs of persons with disabilities through training and the promulgation of ethical standards for public and private health care;

e) Prohibit discrimination against persons with disabilities in the provision of health insurance, and life insurance where such insurance is permitted by national law, which shall be provided in a fair and reasonable manner;

f) Prevent discriminatory denial of health care or health services or food and fluids on the basis of disability.

Source: (United Nations 2006)

4.2. Coverage of rehabilitation care: the need to move towards the universal health coverage and the social protection

4.2.1. The UHC: a social protection against financial risk?

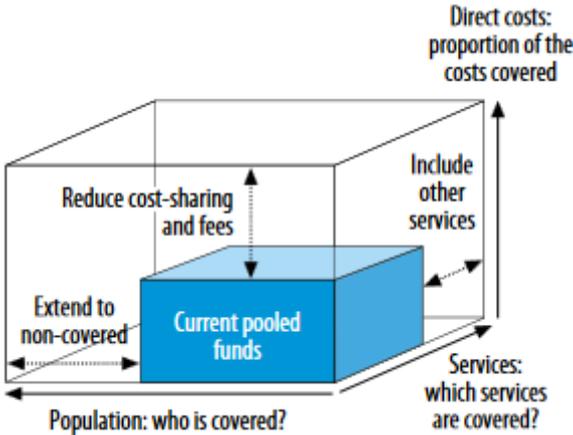
What is the universal health coverage (UHC)?

Until recently rehabilitation and disability received little attention from governments, and this conducted to a poor availability of rehabilitation services, and a lack of coordination between these services. There is also needs to make available for affordable and high-quality services (Bright, Wallace, and Kuper 2018). In 2005, member states of the World Health Organization (WHO) made a commitment to universal health coverage. It conducted to progress towards the Millennium Development Goals (MDGs), and a fall of cash payments used to pay health services. The UHC is also the first international goal of promoting access to health care for all including rehabilitation care.

The goal of the UHC is to ensure that all people obtain the health services they need at an affordable cost which means without risk of financial ruin or impoverishment, now and in the future. Universal health coverage is seen as a means of both improving health and promoting human development (World Health Organization 2013b). The goal of UHC is thus clear, guaranteeing access to health care and a financial protection for all.

The World Health Report 2013 (World Health Organization 2013b) defines the concept of universal health coverage in three dimensions: the health services that are needed, the number of people that need them, and the costs to whoever must pay (users, and third party funders), see Figure 9.

Figure 9: The three dimensions of the universal health coverage



Source: World Health Report 2013.

The first dimension concerns health services and includes the prevention, promotion, treatment, rehabilitation and palliative care. These services have to meet health needs in terms of quantity and quality, and must be resilient. The proportion of costs that individuals have to cover with direct cash payments is used to estimate the need for financial risk protection. The concept of UHC means that no out-of-pocket payments must exceed a certain threshold of affordability. Therefore, decision makers at national level have the role to decide, based on evidence, needed health services and they have to make them universally available, affordable, efficient, equitable, and good quality for the population. These decisions are valid for a limited period of time because of new technologies, research and innovation.

Achieve a wide coverage of financial risk protection may be done through various forms of prepayment for services, that will make possible to spread the financial risks of ill across the populations. Finally, financial risk protection is an instrument of social protection applied to health.

The UHC2030 declaration was presented during the 5th Global Symposium on Health Systems Research, in Liverpool, UK on October 2018. It contains a set of principles on sustainability and transition from external funding. According to the declaration, the transition provides an opportunity for member countries to assess how governance, financing and service delivery are configured to ensure the sustainability of effective coverage for priority interventions. Low- and middle-income countries face a shift in disease burden towards a greater share of non-communicable diseases (NCDs), health financing transition “involving a reduction in reliance on out-of-pocket payments and a greater role for pooled finance, and political changes including decentralization, which are reconfiguring the policy space”.

UHC and rehabilitation

The sustainable development goals (SDGs) target 3.8, and SDG indicators 3.8.1 and 3.8.2 reinforce rehabilitation as integral to the universal health coverage (UHC) (World Health Organization and International Bank for Reconstruction and Development 2017), (Box 2). The UHC is defined as “the provision of high quality, essential services for health promotion, preventions, treatment, rehabilitation and palliation according to need”.

Box 2 : UHC and the 3rd SDG “ensure healthy lives and promote well-being for all at all ages”

SDG target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

SDG indicator 3.8.1: Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health; infectious diseases; non-communicable diseases; and service capacity and access; among the general and the most disadvantaged population).

SDG indicator 3.8.2: Proportion of population with large household expenditures on health as a share of total household expenditure or income.

Source: World Health Organization and International Bank for Reconstruction and Development, 2017

”Rehabilitation is further embedded in the concept of “integrated people-centered health services”, which is the management and delivery of health services “so that people receive a continuum of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative care services...”. Both definitions reiterate rehabilitation as a mainstream health service that should be available across all levels of care and to any person with a health condition, it justified the cross cutting issue of access to rehabilitation and the reason why it is mentioned in several sustainable development goals.

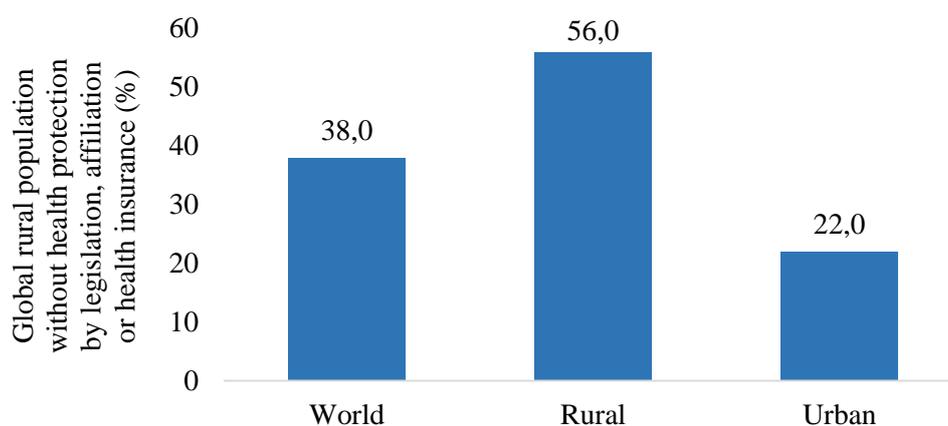
Context of universal health coverage in low- and middle-income countries

As seen in the previous section, the universal health coverage has a pivotal role to play in achieving the sustainable development goals, in particular SDG 3. However, ILO estimated that millions of persons do not benefit from any coverage and have a low access to needed quality care, and this figure include mainly people who live in rural areas and older persons (International Labor Organization 2017).

In many countries, significant investments in health protection and efforts to extend coverage have been made over the past years, in particular for HIV/AIDS. But to date, SDG are not achieved, in particular SDG 3 on universal health coverage. Existing gaps mainly concern coverage’s equity and access to health services (International Labor Organization 2017). In addition, there is limited data available at regional and national level of low- and middle-income countries.

According to Scheil-Adlung (Scheil-Adlung 2015), rural populations experience important inequities in accessing to health care services compared to population living in urban areas, at regional or global levels. As shown in the Figure 10, 56% of the rural population worldwide remains without any health protection by legislation, affiliation or health insurance in 2015, while this percentage is estimated to 22% for urban population. There is thus a world deficit in the coverage of rural population that is 2.5 times higher than in urban areas, and largest gaps are observed in Africa and Asia. Scheil-Adlung added that in some countries the lack of financial protection and human resources for health may strengthen the extreme social exclusion from access to quality health services face by rural populations.

Figure 10: share of global rural population without health protection by legislation, affiliation or health insurance, 2015.



Source: Scheil-Adlung, 2014

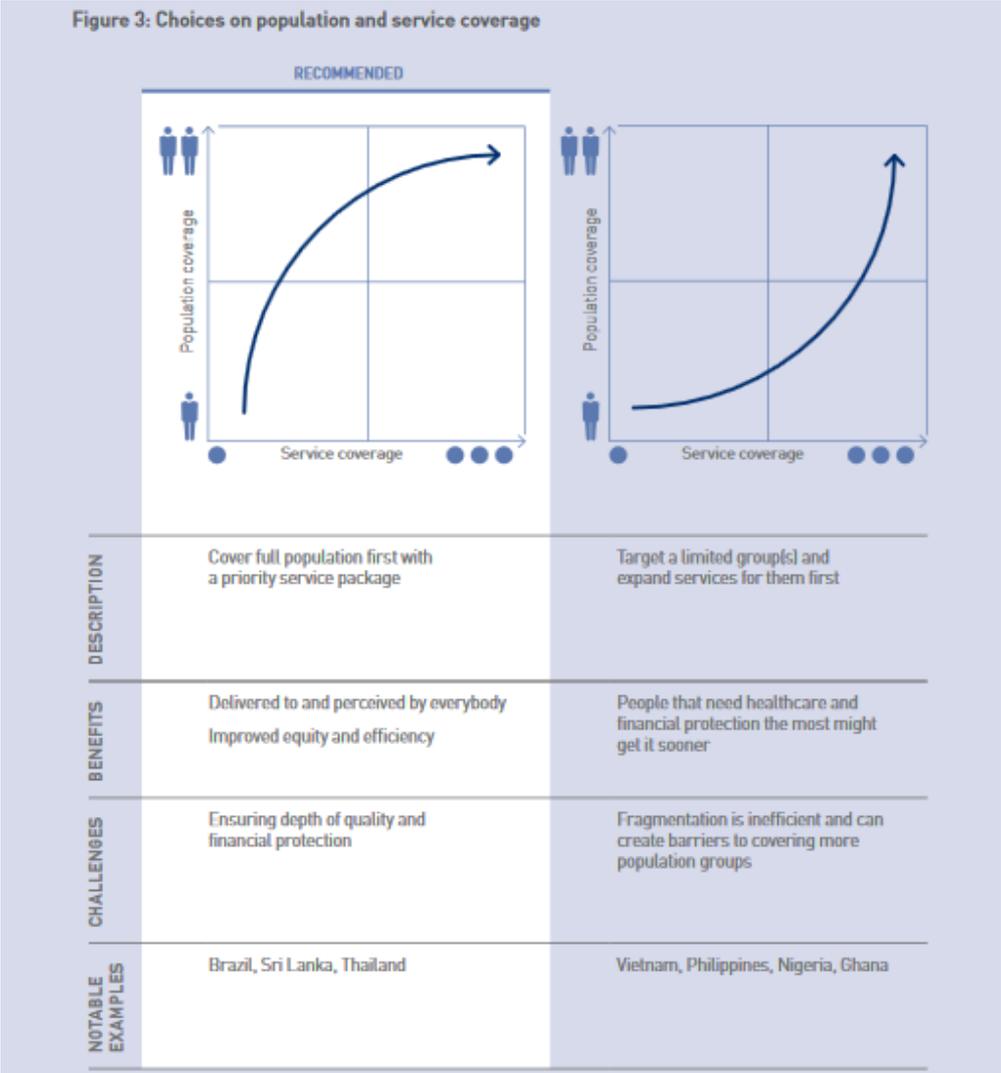
Moreover, the level of out-of-pocket payments (OOP) is also higher in Africa and Asia and it exceed 50% of the total health expenditures in 2015. According to Scheil-Adlung, these OOP are mainly made by rural population in these regions. Rural population thus faced higher exclusion and deficit than people living in urban areas. For instance, in Cambodia, the rural population represents 78% of the total population (National Institute of Statistics and Ministry of Planning 2015), and the share of OOP for the rural population in 2014 was 72% and 19% for the urban population (Scheil-Adlung 2015). This gap between rural and urban OOP revealed health system dysfunction because public funding seems to be less likely to reach the service delivery health facilities in rural areas.

Challenges of UHC are related to quality, efficiency, and coverage, as well as adapting services to the needs of the population (Brown 2018). According to the Author, countries that have made most efforts in terms of access to care and protection from financial hardship are Brazil, Colombia, Costa Rica, Mexico and South Africa, whereas lowest progress have been made in Ethiopia, Guatemala, India, Indonesia and Vietnam. Additionally, Wasgatff and al. observed that improvements made by these countries mainly come from increases in receipt of key health interventions, not from reductions in the incidence of out-of-pocket payments on welfare (Wagstaff and al., 2016).

Evidences that prove potential improvements of health status attributed to the universal health coverage schemes are very scarce. This is partly due to the difficulty to measure this impact. The main aim of the UHC is to cover a range of health services for as many people as

possible in the population and at a minimum cost to the undivided so that they are not impoverished because of their health expenditures. Thus, and according to Nicholson and al., there are two options for developing countries' health systems to develop universal health coverage in their countries, (1) cover full population first with a priority service package and (2) Target a limited group's) and expand services for them first, as described in the Figure 11 (Nicholson and al. 2015). The first option is largely recommended by the international community (Rottingen 2014; SDSN 2014; WHO 2014b).

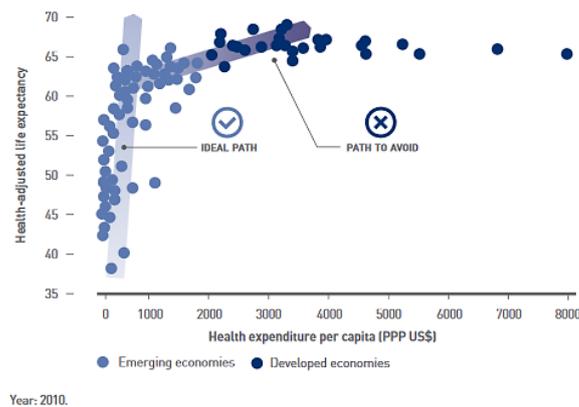
Figure 11: Choices on population and service coverage.



Source: (Nicholson and al. 2015)

Nicholson and al. s also recommend that developing countries health systems should avoid reproducing the path as followed by developed countries, as it is illustrated in the Figure 12.

Figure 12 : Health systems in emerging economies need to avoid the path of health systems in developed economies.



Source : (Nicholson and al. 2015)

Which services to cover? There is no universal answer to this question, and thus no right set of criteria to select services to cover. It is very dependent from country's context. However, the selection of services should be based on the resources available, and explicit criteria for decision-making that promotes transparency defined at national level with representatives from civil society, and all key actors. Selection should be based on data that will conduct to discussion about evidences highlighted between stakeholders, interest groups and citizens, and then decision in a transparent and accountable manner. Decisions should be accompany by a clearly defined legal framework, and a national health assembly as the main political structure. For this purpose, the WHO developed the OneHealth tool in order to support country planning a comprehensive way (WHO 2013a).

Moreover, authors argued that the UHC is a comprehensive health system approach that significantly improves health of the population. For instance, some authors highlighted that healthy life years and life expectancy at birth were positively associated with universal health care coverage (Ranabhat and al. 2018; Rancic and Jakovljevic 2016; Davis and Huang 2008). Diaz and al. reviewed universal health coverage interventions in low- and middle-income countries and their review showed that UHC improve access to health care (Diaz, Alfonso, and Giedion 2013). But they also highlighted that effects of UHC schemes on access, financial protection and health status varies across national contexts, UHC schemes design, and UHC scheme implementation processes.

Critical analysis of the UHC scheme

The current discourse on universal health coverage (UHC) focused on « sustainable health financing », dominates international discussions on healthcare. The discourse on UHC has moved from how service should be provided to how services should be financed.

The UHC is an important target of health SDG due to the combination of financial protection against catastrophic health expenditure and the aim to ensure access to essential services. Advantage of this target is the measurable goal.

Within the UHC debate, an obvious argument is related to the contradiction between the theory of the UHC and how countries are implemented it. Most of countries target in their mechanisms mainly excluded and vulnerable population first.

In addition, critics highlighted that the coverage is define as being “depth” but allows a definition of health care coverage as basic package of healthcare, regarding to social processes and political actions that make an acceptable public role in health. In consequence, Savedoff and al. argued that some governments will first regulates the health care sector, while others would have first finance and directly provides care to the population (W. D. Savedoff and al. 2012).

Furthermore, there is a lack of consensus on the concept of universal health coverage and its meanings. According to Stuckler, most definition of UHC referred to universal coverage, but it often differed regarding to the set of healthcare service that can be comprehensive or limited. And this is the all point of international advocacy for the inclusion of rehabilitation care, governments of low- and middle-income countries do not prioritize this type of service as they do not want, or are not in financial or political capacity to, take the definition of the universal health coverage as a comprehensive range of health care service that is covered for the population (Stuckler, Feigl, and McKee 2010).

Improvement of health outcomes should be linked to the question of how public systems could be made truly universal, according to (People’s Health Movement and al., 2015). The fight for a more equitable health system has to be part “of the broader struggle for comprehensive rights and entitlements, and to take this struggle forward, the dominant interpretation of UHC today – weakening public systems and the pursuit of private profit – needs to be understood and questioned”.

The UHC goal has become a unifying principle for all countries, and a top priority for the WHO. Das and al. argued that UHC can achieve its primary aim that is improve health of populations, but it implies that patients must have access to high quality services, and thus that UHC is effective in all countries because without quality, access to care is irrelevant (Das and al. 2018). Moreover, effectiveness of UHC also involves considering the emerging role of other areas for health systems “such as community engagement within UHC, and how community engagement can shape the delivery of quality health services that are safe, effective, efficient, equitable, people centered and that integrate care (Odugleh-Kolev and Parrish-Sprowl 2018).

Does universal health coverage really improved population’s health?

Different pathways toward the universal health coverage

Countries have taken different trajectories in making progress toward UHC and improve achievement of equity in health, financial protection and long-term sustainability. According to their socio-economic context as well as their political context, trajectories differ.

A common trend can be observed: a mix of financing sources in order to cover different population groups. For instance, Tangcharoensathien and al. studied health financing reforms in southeast Asia and they have highlighted that: a mandatory social health insurance usually covered public and private sector employees through contributory schemes financed by payroll-tax; Ministry of Health provides, directly or indirectly, the coverage of the poor with tax-financed mechanisms; and the informal sector is mainly covered through a variety of funding sources from full premium contributions to partial and fully tax subsidized premiums (Tangcharoensathien and al. 2011). They also observed that common path of most Asian countries is a shift from an initial full contribution to tax funding.

Another route taken by countries toward the UHC is using existing services that are officially provided free-of-charge for patients within the public health system. But, Tangcharoensathien and al showed that in some countries government spending on health may not fit with the increased demand of health care, and the result is an increase of the level of out-of-pocket payments (Tangcharoensathien, Mills, and Palu 2015).

According to Letourmy (Letourmy 2008), the development of health insurance, in the context of the Millennium Development Goals and the universal health coverage, for African countries usually followed a three phases process. The first phase is a fragmented approach

with the development of health insurance schemes only for the formal sector and through a social security system (e.g. Gabon, Guinea, and Senegal) or through the creation of mutual health organizations (e.g. Cameroon, Ivory Coast, and South Africa). During this phase, the author underlined a variable involvement of the state and a lack of effective supervision of institutions created. The second phase is the development of micro health insurance for the informal sector such as community-based health insurance schemes. And the third phase is the inclusion of health insurance in national policies of universal health coverage. In this last phase, both formal and informal sectors are targeted. The institutional pattern provides a form of coverage to each group of the population (e.g. Ivory Coast, Gabon, Ghana, Nigeria), or it associates one type of coverage to one category of people and progressively implement the corresponding schemes (e.g. Mali, Senegal, and Tanzania). Among African countries that have followed the UHC target and implemented health insurance, their system is mainly characterized by the gradual increase of informal population joining social protection schemes, and the non-negotiable pivotal role conferred to the government in order to organize the membership of population (Letourmy 2008).

Impact of UHC in LMICs

The universal health coverage (UHC), as seen in the previous sections, is a program or strategy that involves several interventions. Usually, studies that evaluate the impact of UHC focused on the impact of one intervention and as Diaz and al. observed, these studies used not-enrolled people of the intervention as a counterfactual (Diaz and al., 2013).

Even if the universal health coverage (UHC) do not guarantee an access to every healthcare services for all the population, it provides at least a basic range of high-impact primary care interventions to theoretically all users (Quick and al., 2014). Several studies analyzed the impact of universal health coverage through the UHC concept or through health insurance, there is sufficient evidence to assume that one of the impact of UHC is the improvement of access to healthcare services (Buchmueller and al., 2005; Diaz and al., 2013; Hadley, 2003). However, this impact varies across different groups and depends on characteristics of each scheme or intervention.

Some universal health coverage programs have shown positive impacts on the access to needed health services for women (Frenk, Gómez-Dantés, and Langer 2012; Gakidou and al. 2006; Knaul and al. 2012). However, positive effect of universal health coverage schemes on

access to healthcare is not generalized. Indeed, UHC required a set of effective policies that focused on both demand and supply side, as described in the part 2 of this thesis.

Expansions in health coverage through the measurement of higher levels of pooled health spending usually lead to better population outcomes, but spending effects varies between studies (Moreno-Serra and Smith 2012). Authors added that the effects of public health spending on child and maternal outcomes are greater than in countries with poor governance. As well as, potential equity benefits of progress towards UHC are a consequence adequate targeting of public health expenditures at the most vulnerable people. Additionally, progress of a country towards UHC leads to better health, especially for poor people, and success depends on many factors such as good governance, maintenance of quality standards, benefits package, and the population targets.

There is less literature about the impact of universal health coverage on financial protection compared to impact on access to healthcare services.

The impact of UHC on financial protection depends to several context, according to Diaz and al., as well as specific characteristics: (a) increased utilization, that is an income effect of the price reduction, resulting from the scheme and its associated costs, (b) socioeconomic characteristics of the population, (c) what is purchased (services covered), and (d) how those services are purchased (Diaz, Alfonso, and Giedion 2013).

However, some authors argued that the positive impact on health outcomes remains weak because of important methodological challenges. Authors illustrated this point of view through the example of the “much-acclaimed” Mexico health system that had no effect on health indicators and no change in general pattern of service use, according to them (Moreno-Serra and Smith, 2012; People’s Health Movement and al., 2015).

A poor quality of care can prejudiced the impact on health even when an increase of the coverage is observed (Quick, Jay, and Langer 2014). Nevertheless, in their review, Diaz and al. found that there are a majority of inconclusive studies about the impact of universal health coverage on improvement of health status. According to their review of the literature, universal health coverage interventions in LMICs improve access to healthcare, UHC has often has a positive effect on financial protection, but it is less convincing, and in some rare cases it seems to have a positive impact on health status (Diaz, Alfonso, and Giedion 2013).

4.2.2. Different forms of social protections in LMICs

Social protection in health in low- and middle- income countries (LMICs)

Social protection in health has been at the core of international experts' advocacy since the millennium development goals (MDGs), and the sustainable development goals (SDGs). The corresponding SDG is the target 1.3 that stipulates the following: "to implement nationally appropriate social protection measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable". And the corresponding indicator 1.3.1 is the "proportion of population covered by social protection systems and floors, by sex, distinguishing children, unemployed persons, older persons, people with disabilities, pregnant women with newborns, work-injury victims and the poor and the vulnerable". In addition, other sustainable development goals and targets refer directly or indirectly to social protection: target 3.8 specifies that the achievement of the universal health coverage should include, in particular, financial risk protection; target 5.5 refers to social protection policies as one of the means to recognize and value unpaid care and domestic work; target 8.5 that indirectly refers to social protection as a pillar of decent work for all men and women; and target 10.4 that is to adopt policies, especially social protection policies in aim to achieve greater equality within and among countries. Therefore, social protection systems have a major role to play in order to promote social and economic development, as well as more inclusive societies (International Labor Organization 2017) and transformative change (UNRISD 2010). Several major international and multilateral organizations (e.g. FAO, ILO, OECD, UNICEF, WHO, or World Bank) have included in their strategic framework the pivotal role of a coherent and effective social protection in order to build inclusive and sustainable social protection systems, in addition to other policies (FAO 2017; ILO 2012; OECD 2009; UNICEF 2012; WHO 2010c; World Bank 2012).

To date it is commonly accepted that social protection programs have a high positive impact on poverty reduction, under some conditions such as minimum level of administrative and financial capacity, or political will (Bastagli 2016).

Social protection or social security is a set of policies and programs that aim to reduce poverty, and also to prevent people to fall (back) into poverty across the life cycle (Bastagli 2016; Chronic Poverty Advisory Network 2014). Thus, social protection intend to reduce poverty and smooth income and consumption over lifetime, and redistribute income and wealth within the population (Bastagli 2016). According to ILO (International Labor

Organization 2017), social protection is divided in nine main areas: child and family benefits, maternity protection, unemployment support, employment injury benefits, sickness benefits, health protection, old-age benefits, disability benefits and survivors' benefits. Social protection mechanisms in health will mainly provide a support for the population to reduce the risk of unforeseen medical expenses (Tull 2018).

A comprehensive social protection system will address all these areas with a set of mix contributory (e.g. social insurance) and non-contributory (e.g. tax-financed social assistance) schemes. Various types of social protection schemes exist and the main one are: social assistance, social insurance, labor market interventions, and traditional or informal social protection (Browne 2015).

Social assistance is “direct, regular and predictable cash or in-kind resources transfers to poor and vulnerable individuals or households”, and it is commonly provided by the government and financed through tax at national level (Arnold, Conway, and Greenslade 2011; Barrientos 2010). Transfers are no-contributory mechanisms, and some focus on vulnerable populations whiles other target broadly to low-income groups (Browne 2015). Within this scheme, Browne identified 5 types of social assistance tools, see table 9.

Social insurance scheme is a contributory program that covers costs, matched or subsidized by scheme provider, related to life-course events (Barrientos 2010). This scheme includes contributory pensions, health, unemployment or disaster insurance, and funeral assistance (Norton, Conway, and Foster 2001). It is provided through a bank or employer, or through a pool fund at community level (Browne 2015), but the coverage remains limited as it is for employees and civil servants in the formal sector.

Labor market interventions provide a coverage for more vulnerable people who are able to work (Barrientos 2010). However, vulnerable people, including people with disabilities are often excluded from the labor market (Browne 2015) because they are not able to work or they work in the informal sector, and thus they can be left out of this system.

Table 9: Social assistance tools

Tools	Details
Cash transfers	Direct, regular and predictable. It raises and smooths incomes to reduce poverty and vulnerability. There are two types: unconditional cash transfers and conditional cash transfers.
Social pensions	Form of cash transfer targeted by age and delivered as state pensions. Most common social protection tool, with the widest global coverage and often highest national spend.
In-kind transfers	Economic and livelihood asset transfers to households, facilitating income generation. They tend to take an integrated approach, linking the transfer with skills training and other activities
School feeding	Type if in-kind assistance, it is free nutrition meal at school more or less take home rations for children most in need. They help encourage parents to keep children in school.
Public works/employment programs	Provide jobs on infrastructure projects for cash or food. Their function is primarily poverty alleviation, job creation or social protection. Politically popular tools but arguably inefficient.

Source: Author, adapted from Arnold and al., 2011; Browne, 2015; and Norton and al., 2001.

Traditional or informal social protection are community based types of social protection that allow a risk distribution among the people of the community and thus can be a temporary substitute to formal schemes (Norton, Conway, and Foster 2001).

Other social protection schemes exist and can take the form of **social care** that is a type of social assistance, e.g. home-based care and family support services (Browne 2015). **Government or private subsidies**, often regressive, may be another form of social protection if they aim to increase access to healthcare for the poor or reduce financial risk (Norton, Conway, and Foster 2001).

In the literature, evidences showed that taxes and transfers can be a powerful redistributive tool, tax and transfer policy design and implementation details matter to distributional outcomes, and the level and composition of revenue (financing mix) matter to distributional outcomes and policy sustainability (Bastagli 2016).

There were some advances in improving the social protection coverage in many countries. But, efforts made to build these systems, including social protection floors, remains limited and not fast enough compared to the needs (International Labor Organization 2017).

Considerations of successful experiences towards UHC

Many African countries are facing a challenge to ensure certain coherence between national policies, strategies, programs and activities in the promotion of social protection (Holmes and Lwanga-Ntale 2012). There are thus various models of universal health coverage worldwide. Indeed, as many models as they are countries that developed UHC schemes and interventions.

Nonetheless, few countries have developed efficient and effective UHC schemes. In this section we reviewed selected successful experiences of UHC: China, Colombia and Thailand.

In China, the universal health coverage has covered 96.9% of its 1.3 billion population. Strong political commitment and leadership have contributed to a continuous development of three main public insurance schemes: for urban workers, urban residents and for rural residents (Tuangratananon and al. 2019). The first scheme provides a comprehensive benefit package that covers 81% of insurable costs, whereas the two other schemes are voluntary insurance schemes that cover more than 50% of the insurable medical cost and reach 1.1 billion people. The level of out-of-pocket payments as a share of national health expenditures decreased from 60% in 2001 to 34% in 2013. China's government decided to cover part or all poor families 'out-of-pocket. Nevertheless, some challenges remain and include health inequity between urban and rural populations, poor quality of healthcare services, and important increased of health expenditure but without appropriate cost control (International Labor Organization 2017).

In Colombia, the health system is based on the principle of universality: all citizens have to join a scheme, one for those with contributory capacity or the subsidized scheme for low-income workers, which have both same benefits. Colombian UHC helped to achieved high coverage rates: from 1993 to 2014, affiliation to social health insurance has increased from 25% to 96%, and UHC contributed to reduce the out-of-pocket payments that fell to 15.9% of government total health expenditures in 2011 (International Labor Organization 2017).

In 2001, Thailand strengthened its several health insurance schemes with the implementation of the universal health coverage, the UCS or Universal Healthcare Coverage scheme, and targeted the informal sector that conducted to an increase of the number of covered people in the population. The scheme has been designed according to universality principle. It means that the scheme is for everybody and it does not target any group of the population. The scheme is financed through taxes and provides free health care at the point of service. Package of care covered is comprehensive and includes general medical care and rehabilitation services, as well as high-cost medical treatment and emergency care. This scheme controls the cost and ensures its financial sustainability by fixing the annual budget and capping provider payments (International Labor Organization 2017). Thailand had increased its fiscal space from favorable economic growth that matched with political and

financial commitments to health development, that resulted in favorable resources for health infrastructure and health workforce development (Tangcharoensathien and al., 2018).

Norton and al. argued for effective social protection programs in health (Norton, Conway, and Foster 2001). For rehabilitation, effective social protection programs should result from evidence-based results of rehabilitation needs in the country and the identification of prior population groups to cover. This is applicable to healthcare in general. Therefore, core priorities for the government are the following: create a disaggregated rehabilitation database on issues of poverty, deprivation and needs through a set of questions include in national census; engaging negotiations with all part of the rehabilitation sector in order to strengthen or include rehabilitation in social protection programs.

5. Operating and investment costs of a rehabilitation service

Within my position as a health economist in the non-governmental organization (NGO), Humanity & Inclusion, I tried to address the issue of the cost of physical and functional rehabilitation services in low-and middle-income countries through the development of a tool that will fit with the needs of Humanity & Inclusion's team on the field. Indeed, the demand of the staff and the NGO was to better understand costs of rehabilitation services and obtain trusted data related to physical rehabilitation centers they managed in developing countries. These data will give to the team evidence-based information to be used for advocacy to government and donors.

The tool has been created following a literature review within scientific databases and among people working in institutions and non-governmental organizations worldwide. To date, no cost calculation tool of rehabilitation services has been commonly adopted by field teams in Humanity & Inclusion or other international organization and institution. In fact, a significant number of field programs have developed their own methodology, but the quality of methods varies greatly from one experience to another.

The overall objective of the cost calculation tool of rehabilitation services is to provide a simple and intuitive data collection and processing model for Humanity & Inclusion field teams. First, the objective was to plan and budget the cost of a rehabilitation service in order

to assess resources needs and forecast future costs, as part of a development or advocacy strategy. As a second step, an analysis of the costs of rehabilitation services at the national level, in partnership with the government, could be carried out in order to estimate the costs of extending health coverage to people with disabilities and vulnerable people using rehabilitation services, for example.

As mentioned above, the creation of a new costing tool was based on a review of past experiences in Humanity & Inclusion's countries of intervention. The table 10 presents the cost calculation previous tools that have been studied.

The most complete and successful tool for orthopedic devices is the one developed in 2002 by ISPO⁷, USAID and ICRC, which offers a rigorous methodology. However, due to its complexity, this tool has been left out by the fields that prefer to develop their own methodology. Following this observation, ISPO conducted a survey among several organizations to identify the level of knowledge and use of this tool as well as possible problems encountered by its users. The survey shows that this tool is useful but remains difficult to use in practice. This would be due to the heavy workload prior to its implementation. In addition, this tool only estimates the costs of devices and technical aids, ignoring the issue of other rehabilitation services' costs of physiotherapy, speech therapy or occupational therapy services.

⁷ ISPO : International Society for Prosthetics and Orthotics

Table 10: Implementation experiences in cost analysis of a rehabilitation service

	Tool and method	Studied rehabilitation services	Year of publication	Study period	Main results	Comments
Afghanistan	Tool developed for Kandahar physical rehabilitation center	Prosthetics & orthotics Physiotherapy	2016	(2015)	Production cost of each prosthetics and orthotics' device. Costs of physiotherapy consumables	Comprehensive and easy-to-use tool
Burundi	Tool developed for a physical rehabilitation center (CNAR)	Prosthetics & orthotics	2013	1 year	Costing of devices, definition of a pricing policy	The purpose of this tool was to review the pricing policy within the center. Depreciation of buildings and machinery has not been taken into account.
Cambodia	Excel tool: cost and revenue analysis tool (CORE)	Prosthetics & orthotics	2004	1 year		Prey Veng physical rehabilitation center
	Tool developed for a physical rehabilitation center (Kampong Cham)	Prosthetics & orthotics	2014	1 year		Objective was to improve the budget process and compare the efficiency of this center and others across the country.
	Tool developed by ISPO, USAID and ICRC*	Prosthetics & orthotics	2014	1 year		Physical rehabilitation center of Battambang (BAAand Kampong Speu (KAM)
	Cost allocation tool	Prosthetics & orthotics	2016	1 year		
China (Tibet)	Tool developed by ISPO, USAID and ICRC*, version of 2002.	Prosthetics & orthotics	2004		Price of devices	Limited tool with only one service taken into account.
Colombia	Tool developed by a consultant	Prosthetics & orthotics	2004	1 year	Total production cost for each device	Excel tool in English and Spanish
Kosovo	Tool developed by a consultant	Prosthetics & orthotics Physiotherapy (only hour cost)	2003	1 year		National physical rehabilitation center of Pristina
Mali	Tool developed by	Prosthetics & orthotics	2004	1 year (2003)	"Real" price of equipment for	They did not take into account the

	Tool and method	Studied rehabilitation services	Year of publication	Study period	Main results	Comments
	Humanity & Inclusion				adults and children. Calculation of the labor recovery margin, and calculation of the indirect cost recovery margin	depreciation of equipment and material. No readjustment systems for inflation. No readjustment systems in the case of increases in raw material prices, wages and operating expenses.
Morocco	Tool developed for the NOOR physical rehabilitation center	Prosthetics & orthotics	2005	No information available	Estimation of the cost price and the selling price for each device.	No depreciation cost included.
Nepal	Cost calculation for assistive devices template	Prosthetics & orthotics	2014-15			Consideration of depreciation cost
Rwanda	Tool developed for a physical rehabilitation center	Prosthetics & orthotics	2005	No information available	Estimate of the cost of each device.	No depreciation cost included.
Togo	Tool developed by a consultant	Prosthetics & orthotics Physiotherapy Speech therapy	2006	1 month (Nov-Dec 2006)	Total cost per student for each ENAM department	Not adapted to Humanity & inclusion's expectations.

Sources: Author, based on the following studies: Bigane and Conombo, 2013; Conombo, 2004; Fundacion Rei, 2004; Humanity & Inclusion, 2016, 2014, 2006, 2005a, 2005b; Humanity & Inclusion Afghanistan, 2016; ISPO and al., 2014; Palanchoke, 2015; Prey Veng Rehabilitation center, 2004; Schlierf, 2003; Wondergem, 2004.

The tool we developed estimates the investment and operating costs of all rehabilitation services: prosthetics, orthotics and technical aids, physiotherapy, occupational therapy and speech therapy. The proposed costing tool draws heavily on the different experiences identified within Humanity & Inclusion's countries of intervention.

The application of the tool in rehabilitation center should follow ten steps, as recommended in the literature (Özaltın and Cashin 2014).

(1) Involve rehabilitation stakeholders of the costing exercise in order to facilitate requests for official authorizations, commitment of Ministries in the implementation of the study, construction of the sample, sharing of results, etc. This meeting also provides an opportunity to solicit policy makers for official support in the context of a national cost analysis.

(2) Define the scope of the exercise. This step is an opportunity to review everyone's expectations for this costing exercise: what data do we need, for what purpose, for what perspective, for what types of healthcare providers, what rehabilitation service(s), and what categories and cost elements do we want to take into account in this study?

(3) Select the appropriate methodology whether the cost calculation will be retrospective, resources have already been used and the objective is to look back to estimate costs, or prospective, resources have not been used and the objective is to measure costs as they occur over a defined period of time; and decide on the period for calculating costs: one year in general for retrospective cost analysis, and it is variable for a prospective study. For simplicity of implementation, we recommend adopting a retrospective approach, as the data already exist. However, attention should be paid to possible gaps in the availability, quality or transparency of data that could affect the reliability of the results.

(4) Develop the data management plan through the definition of responsibility assignment matrix (or ARCI), identification of the minimum data necessary to obtain valid results, using easily accessible data sources, the review of previous costing exercises for rehabilitation services in the country, the determination of the level of disaggregation of data required for analysis, the development of strategies to address potential challenges related to missing data, and the assessment of the feasibility of the data management plan given time and budget constraints.

(5), Adapt the tool according to country's context,

(6) Select the sample of the costing exercise (optional),

(7) Conduct a pre-test of the tool and depending on the results, make relevant modifications to the tool and decide whether or not to do another pre-test and/or to include the data from the pre-test(s) in the final analysis.

(8) Collect, verify and process data.

(9) Analyze and validate data.

(10) Report and use the results.

The study is a package that contains a set of documents to facilitate its utilization on the field. Concretely, this costs analysis tool is composed of 2 interconnected Excel files, the main one and its Annex, as described below.

Table 11: Description of the content of the two Excel files of the cost analysis tool

Costs analysis of rehabilitation service			
CC-Rehab tool	Instructions	Annex CC-Rehab tool	Instructions
	1. Staff and wages		0. Selection of costed care
	2. Direct labour cost		1. PT time
	3. Indirect cost of production		2. PT material
	4. Summary of centre costs		3. PT calculations
	5. Statistics of the centre		1. OT time
			2. OT material
			3. OT calculations
			1. ST time
			2. ST material
			3. ST calculations
			1. AT time
			2. AT material
			3. AT calculations
			4. Costs of rehabilitation care

Source: Author.

The table 12 summarizes the aim of each spreadsheet of the main Excel file. Extracts from the tool can be retrieved in the Annex section.

Table 12: Description of the spreadsheets of the costs analysis tool of a rehabilitation service at center's level

Main Excel file	
Spreadsheets	Aims and details
Instructions	Presentation of the Excel file.
1. Staff and wages	List all staff working in technical and administrative departments and insert their rate of employment, appropriate occupational level and monthly gross wage.
2. Direct labour cost	Estimate the direct labour cost per minute for each service.
3. Indirect cost of production	Estimate the indirect cost of production of each service per minute.
4. Summary of centre costs	Summarize all costs and estimate the costs of the centre.
5. Statistics of the centre	Produce statistics related to costs of services delivered and devices produced.

Annex of the Excel file	
Spreadsheets	Aims and details
Instructions	Presentation of the Excel file.
1. PT time	Estimation of time spent by professionals for each session.
2. PT material	Information regarding quantity and cost of material used to provide a session.
3. PT calculations	Calculation of the cost of a session.
1. ST time	Estimation of time spent by professionals for each session.
2. ST material	Information regarding quantity and cost of material used to provide a session.
3. ST calculations	Calculation of the cost of a session.
1. AT time	Estimation of time spent by professionals for each device.
2. AT material	Information regarding quantity and cost of material used to provide a session.
3. AT calculations	Calculation of the cost of a device.
4. Costs of rehabilitation care	Automatic calculations of the costs of rehabilitation care.

Note: PT: physiotherapy; OT: occupational therapy; ST: speech therapy and AT: assistive technology.

Source: Author

To carry out this study, it is suggested to organize a workshop with the aim of an effective and efficient data collection according to the financial and time constraints of the project. A certain number of people have to be gathered for the workshop: representatives of all rehabilitation services and administrative service of the studied center. Before the workshop, professionals of the center must gather information and/or pre-fill some parts of the Excel files, as described in Annex.

This tool provides financial data on rehabilitation services. The results of the analysis of the costs of rehabilitation services are therefore a means of advocacy and fundraising with policy makers and donors.

The objective of this tool is to plan and budget the cost of a rehabilitation service in order to assess resource needs and forecast future costs as part of a development or advocacy strategy. In a subsequent activity, it may be considered to carry out a costs analysis of rehabilitation services at the national level, in partnership with the government. This can be done to estimate the costs of extending health coverage to disabled and vulnerable people using rehabilitation services, for example.

Convincing policy makers or any other stakeholder in the rehabilitation sector of the validity of the analysis can be a challenge. Therefore, it is recommended to involve them before, during and after the study in order to ensure a productive partnership, especially in the context of a national study.

6. Conclusion

Rehabilitation context in low-and middle-income countries

As stated in the United Nations Convention for the Rights on People with Disabilities (UNCRPD) in the article 26, the access to rehabilitation services for persons with disabilities is a human right (United Nations 2006). In this part, we analyzed barriers from the supply and demand sides of physical rehabilitation care in low- and middle-income countries. All these barriers represent a limitation to access to needed rehabilitation care for people with disabilities and people without disabilities who need it.

Globally, over one billion people live with physical, sensory, intellectual, or mental health impairment significant enough to affect their daily lives. There is a high and growing prevalence of severe disability that conducts to a higher demand for rehabilitation care worldwide. As noted in this chapter, health conditions refer to disease, acute or chronic, disorder, injury or trauma. A health condition may also include other circumstances such as pregnancy, ageing, stress, congenital anomaly or genetic predisposition.

There is a scarce of literature concerning the determinants of disability and rehabilitation. However, a recent legal framework for rehabilitation and disability has been developed in the past decades and the first one was the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) that promoted persons with disabilities equal rights. Since this convention, international community supported by WHO members states committed about rehabilitation and assistive technologies through their commitment to strengthen provision of quality rehabilitation at all levels of the health system.

In addition, the demand for rehabilitation services will continue to increase in light of global health and demographic trends: populations are ageing; there is an increase of the prevalence of non-communicable diseases, as well as consequences of injuries.

The demand side of rehabilitation services in LMICs

The analysis of the demand side of the rehabilitation focused on barriers to access to rehabilitation services in low-and middle-income countries for people with disabilities and those who need it. Literature on the access to health services is wide and many authors developed conceptual framework on the access to healthcare. Main barriers highlighted from

our analysis are interconnected and often transversal: financial accessibility to rehabilitation care, physical barriers linked to the lack of availability of rehabilitation services as well as physical barriers linked to the urban access to health facilities or rehabilitation centers, the perception of the quality of services that revealed a mistrust in health workers, and discrimination, economic and social exclusion of people with disabilities within the society.

The supply side of rehabilitation services in LMICs

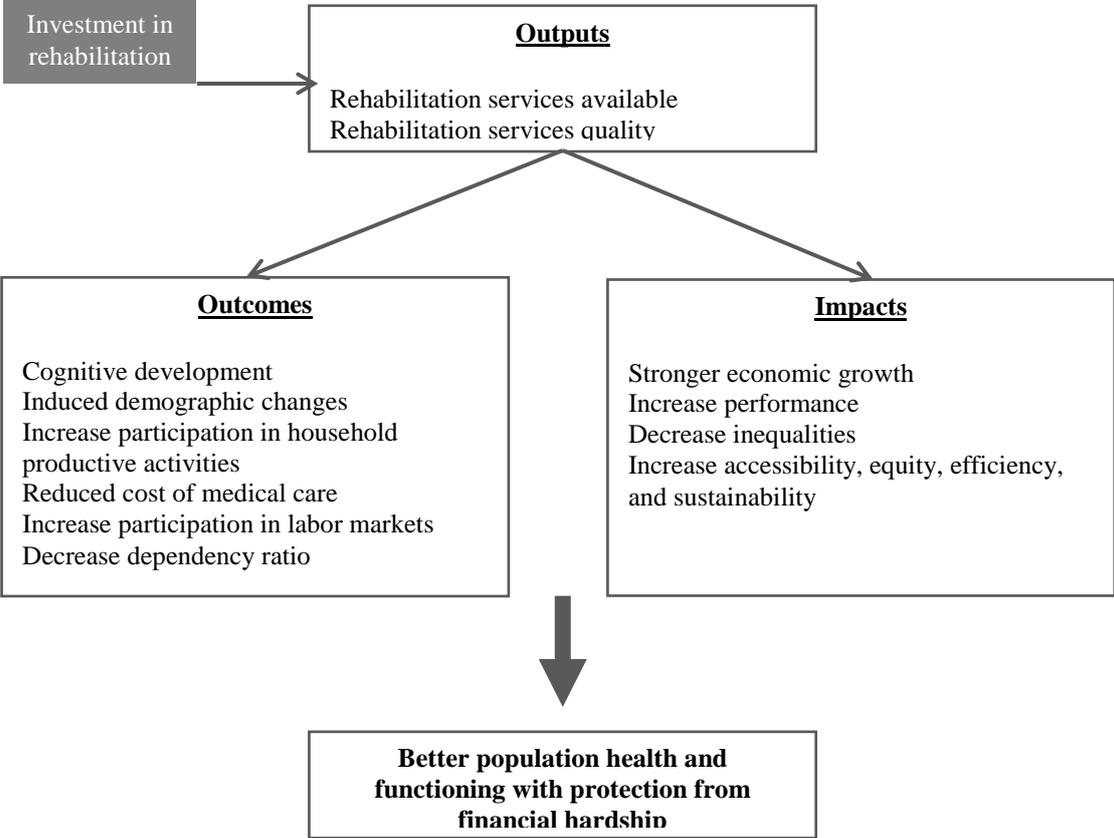
Globally, there is a misalignment of funding compared to the scale of needs for rehabilitation and health in low- and middle-income countries (LMICs). This misalignment is visible from both external and domestic funding. However, there is currently a deep dynamic of the international community to improve health financing, in line with the main objectives, the sustainable development goals. But, even investments raised in the health sectors, there is a problematic between donors' investments and priority needs in low-resources settings, particularly regarding to the volume of investments that goes to HIV/AIDS and the extend of the need if we compare to non-communicable diseases. Moreover, there is a gap between emergency and development assistance for health, a high dependence of LMICs to external financing.

Furthermore, this misalignment of funding to the needs of population can be also observed in domestic health expenditures. Particularly in low-income economies, public health budget remains limited and does not satisfied requirements proposed by the international community. This problematic is even worse for the rehabilitation and disability sectors. Until recently, little attention has been received from this sector in terms of financing and laws and policies. As a result, budget for rehabilitation sector is still limited, and the main consequence is a shortage in rehabilitation workforce that have serious implications for the achievement of the sustainable development goals and thus for population health.

Another issue raised on the supply side of this sector is linked to governance of health system. The Figure 13 summarizes the benefits of investing in rehabilitation and disability in a low- and middle-income country. We reviewed the complex concept of governance and identified the bottleneck of governance, its impact on social protection, the reasons why good governance is essential in a healthy health system and potential good practices to fight against corruption in health system. Then, we focused on specific care that are rehabilitation services

and identified how governance is an issue for the proper delivery of these care. Literature gave us possible answers that address supply issues of the rehabilitation sector.

Figure 13: Economic benefits of investing in rehabilitation system



Source: Author, adapted from (Belli and Appaix 2003)

Coverage of rehabilitation care in LMICs

We analyzed the coverage of rehabilitation care in LMICs and identified the need to move towards the universal health coverage and social protection schemes for the population. Until recently rehabilitation and disability received little attention from governments, and this conducted to a poor availability of rehabilitation services, a lack of coordination between these services, and a need to make these services available and affordable and at a high quality. Rehabilitation, as a mainstream service, should be available across all levels of care and to any person with a health condition.

In addition, significant investments in health protection and efforts to extend coverage have been made over the past years, but to date, SDGs are not achieved, in particular SDG 3 on

universal health coverage, and existing gaps mainly concern coverage's equity and access to health services. Moreover, literature showed that UHC is a comprehensive health system approach that significantly improves health of the populations. And, Countries have taken different trajectories in making progress toward UHC and improve achievement of equity in health, financial protection and long-term sustainability.

Furthermore, social protection in health has been at the core of international experts' advocacy since the millennium development goals, and the SDGs. Social protection systems have a major role to play in order to promote social and economic development, as well as more inclusive societies, and they intend to reduce poverty and smooth income and consumption over lifetime, and redistribute income and wealth within the population. It is commonly accepted that social protection programs have a high positive impact on poverty reduction, under some conditions such as minimum level of administrative and financial capacity, or political will. A comprehensive social protection system will address all these areas with a set of mix contributory and non-contributory schemes. Finally, efforts made to build these systems, including social protection floors, remains limited and not fast enough compared to the needs.

Some good practices for healthy rehabilitation services integrated in the health system

The demand for rehabilitation and the capacity of countries to deliver services are both grossly disproportionate to need (Cieza 2018). In many countries, there is an ever-widening disability and development gap. While millions of persons without disabilities have benefited from improvements in health, education, economic development, communications and human rights, people with disabilities have been left out of these global health initiatives (N. Groce and Kett 2013).

Moreover, there is a huge lack of data on disability and rehabilitation worldwide. Therefore, **an urgent need is to improve data collection, analysis, synthesis and dissemination on rehabilitation and disability** in order to obtain accurate and comparable data across different countries (WHO 2013b).

However, unless specific measures are taken to **ensure inclusion of persons with disabilities in current and future international development efforts**, including the Sustainable Development Goals, millions of persons with disabilities are at risk of living in continuing

poverty and social isolation while their non-disabled peers begin to lead more prosperous lives (N. Groce and Kett 2013).

Prioritization is essential for countries and has to be adapted to their level of maturity, availability of resources elements of the health system. In the context of universal health coverage, **implementing a social protection system in LMICs is an absolute necessity** to counter the barriers to access to health care faced by the population. However, each country is different, and therefore each **health insurance package must be developed according to the needs of the population**. Defining a single "champion" model for financing health actions is not possible since systems are dynamic and dependent on their past experiences (Kutzin and al., 2016). According to WHO (World Health Organization 2017a), if a country want to bring rehabilitation services provision system that meet the population needs, several recommendations may guide him in terms of service delivery, financing, and assistive products.

Regarding to service delivery, **rehabilitation services should be integrated in the health system**, and they should be integrated in and **between primary, secondary and tertiary levels of the health system**. Additionally, **multidisciplinary rehabilitation should be provided to those who need it**, both community and hospital rehabilitation services should be made available, and hospitals should include specialized rehabilitation units that provide inpatient rehabilitation.

In terms of financing, **financial resources should be allocated to rehabilitation services** in order to meet the recommendations on service delivery. And when health insurance exists, it **should cover rehabilitation services**.

Finally **regarding to assistive products, it is recommended to provide them to those who need them**, and **adequate training is** offered to the user when assistive products are provided.

As seen in this chapter, people with disabilities face a range of barriers when they attempt to access health care. The table 13 provides some potential answers to supply side issues of the rehabilitation sector, faced by low- and middle-income countries. **Main proposed solutions for the six categories of issues mentioned are dependent on the willingness of the government and its compliance to international recommendations for universal access to quality and affordable rehabilitation care**. For instance, possible solution to address the

“Policy and legislation” issue are the following: assess existing policies and services, identify priorities to reduce health inequalities, plan improvements for access and inclusion, make changes to comply with the CRPD, and establish health care standards related to care of persons with disabilities with enforcement mechanisms.

Table 13: supply side issues of rehabilitation care in low- and middle-income countries

Supply side issues related to rehabilitation	Potential answers
Addressing barriers to health care services	<ul style="list-style-type: none"> • Governments can improve health outcomes for people with disabilities by improving access to quality, affordable health care services, which make the best use of available resources. • As several factors interact to inhibit access to health care, reforms in all the interacting components of the health care system are required
Policy and legislation	<ul style="list-style-type: none"> • Assess existing policies and services, identify priorities to reduce health inequalities and plan improvements for access and inclusion. • Make changes to comply with the CRPD • Establish health care standards related to care of persons with disabilities with enforcement mechanisms
Financing	<ul style="list-style-type: none"> • Where private health insurance dominates health care financing, ensure that people with disabilities are covered and consider measures to make the premiums affordable. • Ensure that people with disabilities benefit equally from public health care programs. • Use financial incentives to encourage health-care providers to make services accessible and provide comprehensive assessments, treatment, and follow-ups. • Consider options for reducing or removing out-of-pocket payments for people with disabilities who do not have other means of financing health care services.
Service delivery	<ul style="list-style-type: none"> • Provide a broad range of modifications and adjustments (reasonable accommodation) to facilitate access to health care services. • Empower people with disabilities to maximize their health by providing information, training, and peer support. • Promote community-based rehabilitation to facilitate access for disabled people to existing services. • Identify groups that require alternative service delivery models, for example, targeted services or care coordination to improve access to health care.
Human resources	<ul style="list-style-type: none"> • Integrate disability education into undergraduate and continuing education for all health-care professionals. • Train community workers so that they can play a role in preventive health care services. • Provide evidence-based guidelines for assessment and treatment.
Data and research	<ul style="list-style-type: none"> • Include people with disabilities in health care surveillance. • Conduct more research on the needs, barriers, and health outcomes for people with disabilities.

CRPD: Convention on the Rights of Persons with Disabilities.

Source: Author, adapted from (WHO Africa 2017)

However, these solutions have better results in a country with an increasing growth rate, low dependence to external funding, good governance and limited corruption, and a resilient health system with good foundations. Improving access for the population to rehabilitation services is possible but still remains quite challenging for some countries.

According to Yeoh and al., **governance and leadership are key elements to move towards the universal health goal** (Yeoh and al. 2019), that include rehabilitation services. Indeed, they represent policy instruments and levers that allow a better coordination of interactions of other components of the health system. As wrote before, the **government must have the willingness**, be able to mobilize its resources, and be capable to apply governance functions in order to work toward the UHC objective. Policies related to governance functions and progress toward UHC depend on how they are designed and how they intersect each other.

There are many sources of inefficiency, ineffectiveness, lack of governance, funding, human resources, etc., from the supply side of the rehabilitation sector in terms of misalignment of funding and governance and leadership. However, it seems that there is not one model that fits all approach to reform health systems, and to address these issues. **Governments of low- and middle-income countries can use best practices principles** in order to improve effectiveness and efficiency of health systems.

Transfer of scientific knowledge to international community, particularly to global health persons in charge public action, is a complex and difficult process. Indeed, according to Ouimet and Bédart, “Decision-makers are not only guided by instrumental motivations and their decisions rarely (if ever) emanate from a process such as the one described by the classical theory of rational choice” (Ouimet and Bédart 2015). Therefore, best practices extracted from rehabilitation and disabilities studies may be useful for governments if the **transfer of scientific knowledge is able to raise awareness among policy makers**. Advocacy is thus a prior component of the process and should be realized by civil society, based on robust evidence from the literature.

The two following chapters concern two cases study based on the theoretical analysis developed in this chapter. The second chapter focuses on the analysis of physical and functional rehabilitation services in Cambodia, while the third one provide some inputs from Rwanda’s perspective. As described in the General Introduction, these two low- and middle-

income countries, Cambodia and Rwanda, have been used to concretely understand how physical and functional rehabilitation services are financed, managed and covered by the government and potential non-governmental actors, and how these services are used by people with and without disabilities in these countries. Some challenges and issues raised in this first chapter are faced by Cambodia and Rwanda. Therefore, the analysis of their rehabilitation sector will provide relevant and essential information to better understand how the provision of these services could be improved and how the access for vulnerable people, including people with disabilities, could be enhanced in a specific context.

Chapter 2: Cambodia, a lower-middle income and post-conflict country with high disability rate, limited investments for rehabilitation and disability and governance issues

1. Introduction

According to WHO, 15% of the global population have disabilities and 80% of them are living in developing countries and fall below the poverty line. It is also estimated that only 2% of people experiencing disability in low-and middle-income countries (LMICs) has access to rehabilitation services (WHO and World Bank 2011).

Globally, the prevalence of health conditions associated with severe disability has increased by 23% in the last decade (World Health Organization 2017b). In the Western Pacific Region, 270 million people experience disability. Main health issues faced by these countries are ageing populations, growth in non-communicable diseases and injuries. While the needs for rehabilitation services are growing, the capacities of countries to address those needs are very limited.

WHO estimated (Cieza 2016) that worldwide, 5 prosthetists and orthotists (POs) per 1 million population are needed (based on 140 countries data), there is a need of 750 physiotherapists (PTs) per 1 million population (based on 79 countries data), and needs are estimated to be higher in South-East Asia and Africa regions.

Cambodia, a South-East Asia country, has a very significant amount of people with disabilities and one of the highest amputee rates in the world (Meeuwssen 2015). A large part of the ongoing needs for rehabilitation derives from the period of internal conflict and its aftermath in the 1970s and 1980s (WHO 2015b).

According to the Cambodia Socio Economic Survey (National Institute of Statistics and Ministry of Planning 2015), the prevalence of disability/difficulty is about 4% of the total non-institutional population of Cambodia. And about 24% of persons aged 60 years and above have a disability with a majority of women.

The table below describes the type of difficulties of persons having at least one disability/difficulty. The trend remains almost unchanged from 2004 to 2014, and moving is the second main difficulty faced by people with disabilities. In the CSES 2015, 2016 and 2017, questions related to disability have been removed from the survey, for no appear reason, and despite advocacy of WHO and nongovernmental organization.

Table 14: Cambodian, in the non-institutional population, with at least one disability/difficulty, 2004-2014, percent

Type of difficulty	CSES 2004	CSES 2009	CSES 2010	CSES 2011	CSES 2012	CSES 2013	CSES 2014
Seeing	1.50	4.0	2.80	2.20	2.20	1.90	1.70
Hearing	0.50	1.20	1.00	0.80	0.67	0.70	0.70
Speaking	0.20	0.30	0.30	0.30	0.27	0.30	0.20
Moving	1.00	1.60	1.60	1.60	1.58	1.50	1.10
Feeling or sensing	0.40	0.40	0.30	0.20	0.39	0.30	0.20
Psychological	0.30	0.40	0.30	0.20	0.20	0.30	0.20
Learning	0.00	0.10	0.10	0.10	0.08	0.00	0.10
Fits	0.10	0.10	0.10	0.10	0.02	0.00	0.10

Source: CSES 2013 and 2014

While rehabilitation needs exist and are growing, the rehabilitation service sector in Cambodia remains limited and faces many challenges, especially the financial capacity to ensure that rehabilitation is available and affordable for those who require it.

The purpose of this study was to undertake a comprehensive analysis of the physical and functional rehabilitation economic system in Cambodia using an improved Financial Access to Rehabilitation Services diagnostic tools known as “iFAR”. First of all, we will provide an overview of Cambodia’s general context in terms of geographic, sociodemographic, political, economic, health status and prevalence of disability. Secondly, we will focus on the health system, particularly its organization, the place of rehabilitation services in the health system, the management of these services’ supply, and the financial risk protection coverage for healthcare. Thirdly, we will study financial flows for the rehabilitation service in terms of rehabilitation needs, and health and rehabilitation budgets. Then, we will estimate the average

cost of a rehabilitation service in Cambodia, and then the cost charged to the patients in comparison to the level of Cambodian catastrophic health expenditures. The final section will be dedicated to the development of a tool in order to promote equity and equal access to rehabilitation services in a physical rehabilitation center.

2. Context

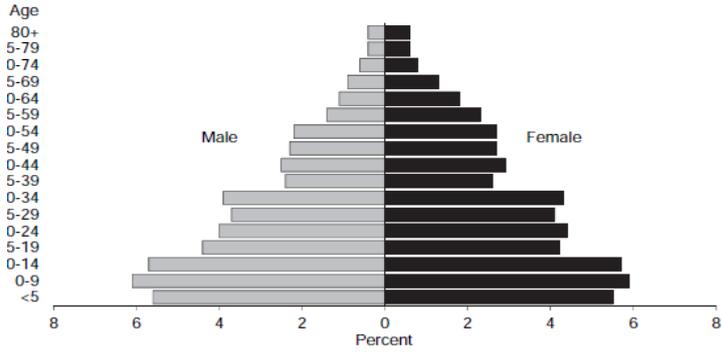
2.1. Geographic and sociodemographic contexts

The Royal Government of Cambodia (RGC) is located in South-East Asia, bordered with Thailand, Laos and Vietnam. The total land area is 181 035 square kilometer. There is a tropical climate with two distinct seasons: the rainy season from May to October with strong winds, high humidity and heavy rains, and the dry season from November to February. The average annual temperature of the capital of Cambodia, Phnom Penh is, 27°C.

According to the 4th CDHS, Cambodia Demographic and Health Survey (National Institute of Statistics, Directorate General for Health, and The DHS program 2015), Cambodia is composed of 24 provinces (including the 2013 division of Kampong Cham province into 2 (Kampong Cham and Tboung Khum provinces)) and 197 districts.

The population was estimated to be 15,577,899 in 2015 (World Bank 2016a) with a rural population of 77.53% (National Institute of Statistics and Ministry of Planning 2015). The proportion of the population that lives in urban areas has doubled by more than half (from 22.47% in 2014 to 9.0% in 1980), particularly in Phnom Penh which was home to 55% of the urban population in 2012. However, the population remains quite young as 43% of the population is aged 19 or younger. Projections forecast that Cambodia will have an ageing population by 2050. As shown in the Figure 16, the percentage of people aged 35 to 44, the pyramid follows an unusual pattern because there are the groups who were born in the 1970s. it corresponds to the Khmer Rouge period which was characterized by few births and high mortality including high child mortality (National Institute of Statistics, Directorate General for Health, and The DHS program 2015).

Figure 14 : Population pyramid in Cambodia



Source: CDHS, 2014

Between 1995 and 2012, Cambodia’s human development index improved by 41%, second only to Bangladesh among the comparator countries and similar to Laos

In 2014 Human development index (HDI), that is an average measure of basic human development achievements in a country, for Cambodia is equal to 0.555 (UNDP 2014). Between 1995 and 2012, Cambodia’s HDI improved by 41% and has the second best score, behind Bangladesh and before Laos within South East Asian countries group (CDRI 2013).

2.2.Political and economic context

2.2.1. Political context

Cambodia emerged from colonialism, domestic conflict and foreign intervention since 1993.

Between 1975-1979, “Under the name of Democratic Kampuchea, the Khmer Rouge destroyed the traditional elements of Cambodian life, money was abolished, the country’s physical infrastructure was dismantled or destroyed, schools destroyed, and intellectuals exterminated. Phnom Penh and other towns were emptied and the urban population was put into forced labor in the countryside. While the country experienced an era of isolation from the outside world, an estimated 1.7 million people (21% of the country’s population) died as the result of forced labor, starvation, lack of medical care and execution” (WHO 2015b). “The Khmer Rouge regime was overthrown in late 1979 by dissident Cambodians supported by Vietnamese troops”.

Cambodia is a constitutional monarchy with the king as head of state, and with the Prime Minister as the head of the Royal Government of Cambodia. In 1993, FUNCINPEC won the

largest number of votes in this first national election while in 1998, 2003, 2008 and 2013, the Cambodian People's Party won subsequent national elections.

Cambodia is divided into provinces and municipalities with a centralized power in the capital. Provinces are subdivided into districts/*khan*, districts are subdivided into communes/*sangkat*, while communes are subdivided into villages. There are Provincial and Municipal governors, and local councils at *sangkat* level that became *khan* governors in 2012. Cambodia is currently involved in a long-term process of political and administrative decentralization (WHO 2015b).

After 1993, there has been an exponential growth in the number of non-governmental organizations. Multilateral and bilateral donors and agencies and international organizations (IOs) collaborated to develop economic, infrastructural and social programs that helped Cambodia in its process of reconstruction. According to the World Bank (World Bank 2006), Cambodia has made remarkable progress in rebuilding infrastructure and human resources, and in establishing peace and stability, a market economy and multi-party democracy.

2.2.2. Economic context

Since July 2016, Cambodia is now classified as a lower-middle income economy by the World Bank Group's classification with a gross national income per capita (GNI) for 2015 reaching current US\$1,070. Cambodia has seen two decades of a robust economic growth rate averaging 7.6% per year (GDP annual growth, in real value) that transformed Cambodia from one of the world's poorest countries to a lower-middle-income country.

According to World Bank's experts, Cambodian's economic growth is expected to remain strong in 2016. This assumption is justified by several sectors of activities: tourism activity, recovering internal demand and dynamic garment exports, slow growth in agriculture and easing construction (World Bank 2016e). The GDP growth is forecast at 7.00% in 2016 and 7.10% in 2017. The GDP growth is approximately the same since 2011, with an average of 7.18% from 2011 to 2015 (Asian Development Bank 2016). In 2015, Cambodia's GDP reached \$18.05 billion.

Cambodian's poverty rate has decreased by half between 2004 and 2012, from 53% to 17.70%, which means that Cambodia achieved from far the Millennium Development Goals

(MDGs) poverty target. Cambodia is ranked 4th as the fastest poverty reduction country in the world from 2004 to 2008, among 69 countries with comparable data. Around 90% of the poor people live in the countryside (World Bank 2016e). Furthermore, the employment rate is very high in Cambodia as 82.80% of the population aged 15 years and above is employed (Asian Development Bank 2016)

Even if the country is now a lower-middle income economy, Cambodia can still benefit from the International Development Association (IDA) from the World Bank (Ly 2016).

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According to the World Bank (World Bank 2011a), the fiscal space can be increased through a reduction in tax exemption, tightening collection, and a restructuring of existing spending. All of this should help to offer room for larger allocations to specific areas that will provide a sustaining strong and inclusive growth. This is confirmed by the fact that the country has a surplus of \$400 million in 2015 due to poor budget planning and execution, and unsatisfactory project implementation. Cambodia saw an increase of about 16.00% of the level of its tax revenue in 2015 (Paviour and Sothear 2016). This is a positive sign of more effective governance.

Transparency and accountability remain limited within the health system. There is no accreditation of health care providers, and the government starts to think to its enforcement. In the private sector, a lack of regulation conducts to a lack of accountability of health workers' practice in this sector (WHO 2015b).

The NGO Transparency International published in 2017 the corruption perceptions index for the year 2016. Cambodia is ranked 156 out of 176 countries with a score of 21 out of 100. For the second year in a row, Cambodia is the most corrupt South East Asian country with a remained extremely restricted space for civil society. The indicator "control of corruption" reflects "perceptions of the extent to which public power is exercised for private gain. Point estimates range from about -2.5 to +2.5, higher values correspond to better governance outcomes" (Transparency International 2017).

The World Justice Project (World Justice Project 2016) measured how the rule of law is experienced by the general public worldwide. According to the defined index, Cambodia was ranked 112 out of 113 countries, and placed at 15 out of 15 countries in the East Asia and Pacific Region, 28 out of 28 among lower-middle income countries (LMICs).

2.3. Health status and prevalence of disability

Health status of Cambodians has made large progress since the 1980s, but it still remains relatively poor if compared to other countries in the region. There are also large disparity in health and access to health services between the rich and the poor and between rural and urban areas (CDRI 2013).

The life expectancy at birth increased since 2005, from 62.07 years to 68.21 years in 2014 (World Bank 2016a). From 2005 to 2014, maternal mortality ratio per 100,000 live births dropped from 472 to 170, under 5 mortality rate per 1,000 live births decreased from 83 to 35, and the net primary school admission rate increased from 81% (2001) to 95.3% (2014) (World Bank 2016e).

Despite these improvements, some challenges still remain to meet the Sustainable Development Goals (SDGs) by 2030. In 2015, around 32% of children under 5 years old (~0.5 million) were stunted, 79% (~12.3 million people) did not have access to piped water

supply, and then 58% (~9.3 million people) did not have access to improved sanitation. (World Bank 2016e).

According to OXFAM (Mauney and Grant 2016), people with disabilities face the challenge of poverty and unsustainable livelihoods (Bailey and Nguon 2014). They are also among the poorest of the poor with a limited access to basic social services, education, skills, vocational training and income generating opportunities (Cooperation Committee for Cambodia 2006). Moreover, the national institute of statistics has estimated that people with disabilities have higher unemployment rates (10.32%) than people in the general population (3.22%) (National Institute of Statistic 2013). It also appears that women and girls with disabilities face more discrimination and negative attitudes, few opportunities to health care and education and increased vulnerability to physical, emotional and sexual violence (Bailey and Nguon 2014). In general, women are also more vulnerable, face higher rates of poverty, lower economic opportunity, higher rates of violence, poorer health conditions compared to their male counterparts (Mauney and Grant 2016).

Growing rehabilitation needs are due to a range of health conditions. Injuries due to conflict and unexploded ordnance (UXO), communicable diseases, poor nutrition and health conditions associated with poverty, ageing population, increases of non-communicable diseases and trauma represent nowadays additional causes of impairment and contribute to increase the prevalence of disability on the country ” (Kleinitz, Middleton, and Hasnan 2016).

Box 3: The concept of DALY

The principal metric of the Global Burden of Disease study conducted by the IHME is the DALYs or disability-adjusted life years. The DALYs “measure the total amount and severity of health problems experienced by a population due to both fatal and non-fatal causes”. This metric is the result from adding together the YLLs (Years of life lost) and YLDs (years lost due to disability) yields. The YLLs measures “the time people lost when they die before attaining their ideal life expectancy or the years of potential life lost”. And, the YLDs measures “reflects the amount of time in a year that people live with any short- or long-term health condition, taking into account the severity of that condition”.

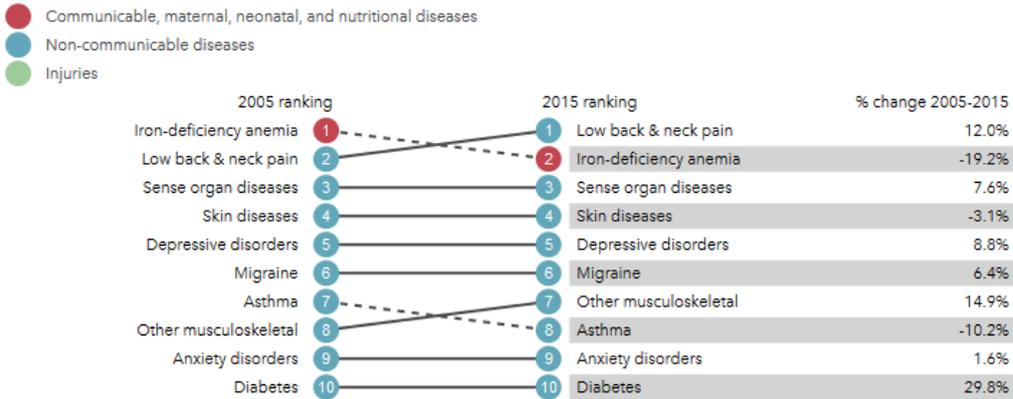
Source: (Institute for Health Metrics and Evaluation 2016).

According to the Global Burden of Disease study 2015, the 10 leading causes of disability-adjusted life year (DALY) in 2015 in Cambodia are ischemic heart disease, lower respiratory

infect, cerebrovascular disease, neonatal preterm birth, road injuries, low back and neck pain, congenital defects, iron-deficiency anemia, HIV/AIDS, and sense organ disease.

The Figure below answers the question “what health problems cause the most disability?” based on YLDs (years lost due to disability) estimations. We notice that non-communicable diseases are the top ranking causes of disability in Cambodia in 2015.

Figure 15 : Top 10 causes of disability by rate in 2015 and percent change, 2005-2015 (YLDs) in Cambodia



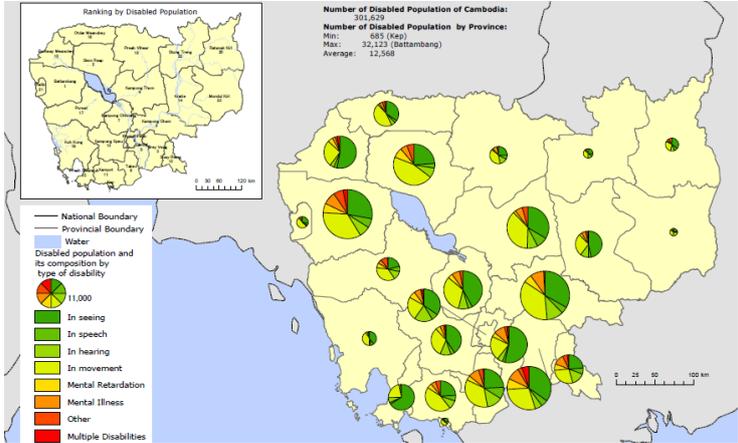
Source: Global Burden of Diseases study 2015, IHME

The 4th CDHS (National Institute of Statistics, Directorate General for Health, and The DHS program 2015) estimates the disability prevalence and found that it is highly correlated with the age of individuals, and the prevalence is higher in middle and older age. For any level of difficulty in functioning the disability prevalence is 9.5%, with a higher prevalence for female (10.4%), and for people living in rural areas (9.6%). The prevalence of disability increases with the age: 1.8% of children aged 5-14 and 44.2% of persons aged 60 and above have some form of disability.

The prevalence rate of disability in Cambodia varies according to the national survey considered. The Cambodia Socio Economic Survey 2014, CSES (National Institute of Statistics and Ministry of Planning 2015), estimates that around 4% of the population has a disability. The most common causes of any disability are the old age and diseases, with a prevalence of respectively 2% and 1%. In addition, the Cambodian Inter-censal Population Survey 2013, CIPS (National Institute of Statistics and Ministry of Planning 2013), estimated that around 2.1% of the population have a disability. Figure 18 presents the distribution of

people with disabilities across provinces. We observed that the more common type of disability across Cambodia is disability in movement and speech, hearing and seeing disabilities. Functional and physical rehabilitation focused on movement and speech disabilities’ treatments. Provinces from the East of Cambodia, Stung Treng, Ratanakiri, Mondulkiri and Preha Vihear, have the lower number of people with disabilities, while they are one of the less populated in the country. However, Kep, the less populated province, has one of the higher prevalence of disability nationwide. Further studies will need to go through the determinants of these disparities among provinces for the prevalence of disabilities.

Figure 16 : People with disabilities’ population and its composition by type of disability and by province in 2013.



Source: Cambodia Inter-Censual Population Survey 2013.

Different estimations of prevalence among national sources may come from a different time of data collection, or a different methodology and/or various definitions of disability. The CDHS and the CSES were conducted at the same period, but the CICPS is two years older than the two others, so the difference may be partially justified by this timing difference. Table 13 presents a brief comparison of the methodology used in the three national surveys. Methodologies used are much closed but slight differences between them cannot entirely express different results of the percentage of persons with disabilities observed, from 2.1% to 10%.

Table 15 : Comparison of CDHS 2014, CSES 2014 and CIPS 2013

	CDHS 2014	CSES 2014	CIPS 2013
Definition of disability	It defined a person with disability as someone having difficulties with seeing, hearing, walking or climbing stairs, remembering or concentrating, performing self-care, or communicating.	It defined disability as a restriction or lack of ability to perform an activity in the manner or within the range considered as normal for a human being; it is a condition in which a person has a problem with his/her body, mind or behavior that limit his/her ability to participate normally in work, school or ordinary social life; it is a permanent or long-term condition and should not include a temporary illness or injury.	It defined disability as difficulty in seeing, speech, in hearing, in movement, mental retardation, mental illness and any other (e.g. specific learning difficulties). And it gives specific details for each difficulty mentioned.
Data collection	February-March 2014	January 2014 – December 2014	March 2013
	4 th CDHS.	13 th CSES	2 nd CIPS.
Methodology	<p>Conducted by Directorate General of Health of the Ministry of Health and the National Institute of Statistics of the Ministry of Planning.</p> <p>Nationally representative sample of women and men age 15-49.</p> <p>19 sampling domains were stratified into a total of 38 sampling strata. 611 clusters selected with 16,356 households selected and 15,825 completed the household questionnaire.</p>	<p>Conducted by National Institute of Statistics of the Ministry of Planning.</p> <p>Sample of 12,096 households, within 19 provincial groups</p> <p>Stratified three-stage sampling design.</p>	<p>955 enumeration areas and 28,680 households with around 1,200 households in each province</p> <p>Stratified two-stage sampling design was used with 955 enumeration areas were considered as primary sampling units and the 1,200 households (in each province) as secondary sampling units.</p>
ratio of people with	Overall, 10% of household members age 5 and older suffer with at least one form of disability.	About 4 % of the total non-institutional population of Cambodia is disabled.	Around 2.1% of the population is estimated to have disabilities with slightly more males than females (2.2 males; 1.9 females).

Source: Author.

2.4. History and status of health coverage and rehabilitation care

2.4.1. Background on rehabilitation

In Cambodia, physical rehabilitation services are mainly not integrated into the health system in low- and middle-income countries.

The five international organizations operating in the management of physical rehabilitation centers (PRCs) since their set up starting from the 80's are the International Committee of the Red Cross (ICRC), Exceed (formerly known as Cambodia Trust), Handicap International Belgium (HIB), Handicap International France (HIF), and Veterans International Cambodia (VIC). They provide comprehensive services (including assistive devices) for a wide range of impairments, from amputations due to mine accidents and road injuries, to birth defects and developmental delays in children, to musculoskeletal disorders and impairments due to chronic diseases.

In 1989, the Ministry of Health (MoH) transferred responsibility for the physical rehabilitation centers to the Ministry of Social Affairs, Veteran and Youth Rehabilitation (MoSVY), even though the main financial and technical support was still provided by international organizations. In 2006, the MoSVY formally informed international and non-governmental organizations supporting the rehabilitation centers, that it would implement a three year strategy (2008-2010) for transferring the management of the 11 centers under public management. In 2008, the MoSVY and the five concerned organizations signed a memorandum of understanding in order to support the gradual handing over of physical rehabilitation centers to the Ministry. In 2009, the 11 PRCs have been officially categorized as Regional, Provincial or National centers by a MoSVY Prakas. In 2011, the Ministry created the Persons with Disabilities Foundation (PWDF) with the aim of developing its capacity to achieve central and standardized management of the PRCs network.

To date, only two of the 11 physical rehabilitation centers (PRCs) are under the management of the MoSVY through PWDF. The nine others are under the management and substantial financial support of four international organizations: Handicap International (1 PRC), ICRC (2 PRCs), Exceed (3PRCs), and Veteran International Cambodia (3 PRCs), as it shown in Table14.

These 4 international organizations collaborate with each other to improve management tools and to improve the coordination with PWDF. Although Standard Working Procedures for the physical rehabilitation centers were issued by the Ministry of Social Affairs, Veteran and Youth Rehabilitation (MoSVY) with inputs for all rehabilitation providers, important differences remain in the type of services provided by each international organization, often reflecting the mandate and scope of activities of the organization. For example, ICRC providing multidisciplinary outreach, Exceed providing high tech P&O, HI providing social

services, HI and VIC providing general physiotherapy. In the 2 PRCs now under the management of PWDF, transfers from the public budget have only partly replaced international aid and this has caused a reduction in the quantity and quality of services provided (Bailey 2016; Verhoeff 2014). With the prospective of decreasing international aid and the fact that it will not be matched by an increase in public budget's transfers, stakeholders have been exploring cost recovery strategies including voluntary contributions by patients.

In early 2013, VIC handed over the management responsibility of Kien Khleang, Kratie and Prey Veng physical rehabilitation centers (PRCs) to People with Disabilities Foundation (PWDF) but they continued to provide financial and technical support. At the end of 2016, these three PRCs were supposed to be fully handed over from VIC to PWDF, due to the end of their donor funding. To date, this full handover has been postponed, and VIC still supports these PRCs. During the transitional period VIC and PWDF jointly developed sustainable transition strategic plan to completely transfer the three PRCs at the end of 2018 to public management through PWDF. MoSVY and Persons with Disabilities Foundation (PWDF) are also in charge of a Spinal Cord Injury Center (SCIC).

The Orthopedic Component Factory (OCF) in Phnom Penh has recently been handed over from ICRC to PWDF in 2016. In 2015, 40% of the OCF's operating costs are covered by the PWDF/government; the ICRC covers the remaining 60%, including support from the WHO through the PRSS. In 2016, ICRC supported incentives for staff and WHO supported raw materials to produce components and running costs covered by PWDF. This is the reason why OCF could provide components free of charge to PRCs since 1993 to 2016. But in 2017, there were any support from any agency. PWDF needs to play important role to run OCF themselves by sale components to PRCs locally as well as overseas through Exceed and ICRC. Resulting from this reason, PWDF/OCF has suggested to customers to deposit 50% of the component price while they order so that they can manage to produce the components for customers. ICRC and Exceed has done agreement to do so (50% deposit). Up-to-date, they have sold some components to Myanmar, ICRC, and Exceed. However, Handicap International has not done any agreement with OCF.

Currently, the MoH provides physical therapy services in a limited number of provincial and national level hospitals, while the MoSVY and international and non-governmental

organizations provide functional rehabilitation services (physiotherapy, prosthetics and orthotics (P&O), and other assistive devices) through the 11 PRCs.

Table 16 : Details of PRCs management changes since 2009.

		PRCs' management			
Location	Status	Situation in 2009	Situation in 2016	Expected situation in 2019-2020	
1	Kampong Seu	Regional	ICRC	ICRC	ICRC
2	Phnom Penh	Hospital P&O training center	Cambodia Trust	Exceed (new name)	Exceed (new name)
3	Kampong Chhnang	Provincial	Cambodia Trust	Exceed	Exceed
4	Preah Sihanouk	Provincial	Cambodia Trust	Exceed	Exceed
5	Siem Reap	Regional	HIB	PWDF	PWDF
6	Takeo	Provincial	HIB	PWDF	PWDF
7	Kampong Cham	Provincial	HIF	HI	HI
8	Battambang	Regional	ICRC	ICRC	ICRC
9	Kien Khleang PP	National	VIC	VIC	PWDF**
10	Prey Veng	Provincial	VIC	VIC	PWDF**
11	Kratie	Provincial	VIC	VIC	PWDF**

* Exceed is the new name of Cambodia Trust.

**Finally, the full handover from VIC to People with Disability Foundation, a government body, has been delayed.

Source: Author, adapted from Flachenberg, 2009

2.4.2. Main challenges for the rehabilitation sector

According to Chou and Barrett (Chou and Barrett 2016), the main barrier for the development of a strategy to strengthen the rehabilitation sector is the lack of coordination among authorities in charge of the rehabilitation sector, as it is split across two government Ministries, Ministry of Social Affairs, Veteran and Youth Rehabilitation (MoSVY) and Ministry of Health (MoH), and multiple agencies. This lack of coordination has several consequences including financial barrier. Indeed, it results in a limited technical and planning capacity to lead the sector, a lack of national data on rehabilitation sector financing and expenditures, and health financing schemes do not especially cover rehabilitation services, leaving this sector inadequately funded.

As per rehabilitation workforce, there is a shortage of human resources. Physiotherapists and Prosthetists and Orthotists are trained in the country, however there is no rehabilitation doctor or nurse, no occupational therapist or speech therapist, as well as no accredited community-based rehabilitation courses.

The coverage of services is poor. Access to rehabilitation services at the community level is scarce, with poor referral mechanisms between existing physical rehabilitation centers and health facilities and almost no outreach programs. PRC capacities including production of devices and service quality decreased dramatically following the handover from international non-governmental organizations to government.

Finally, there are no functioning and comprehensive national data and information system, and thus no data on rehabilitation outcomes and economic benefits.

3. Overview of the health system

3.1. The Cambodian health system

Since the destruction of the Khmer Rouge regime (1979), Cambodia health system has been under progressive reconstruction with substantial international assistance from 1993.

Public health administration is centralized and service delivery responsibilities are assigned to MoH officials at provincial and district level. The public health system is based on a district health system model with three levels of responsibility: Central Ministry, Provincial Level and Operational district level as described by the WHO in Table 15.

Table 17: Organization and responsibilities of the 3 levels of the Public Health System

Public health system	Responsibilities
Central Ministry level	Develops policies, legislation and strategic plans, Responsible for resource mobilization and allocation, Responsible for monitoring, evaluation, research, Maintains the national Health Information System, Provides training, support to provinces and districts, Coordinates with other ministries and external aid.
Provincial level	Links the central Ministry with MOH health Operational Districts, Implement the Health Strategic Plan via Annual Operational Plans, Responsible for the equitable distribution and effective use of available resources, Supports the development of health Operational Districts.
Operational district level	Responsible for effective, efficient and comprehensive health-service delivery, Interprets, disseminates and implements national policies and provincial health strategies.

Source: Author, adapted from WHO, The Kingdom of Cambodia health system review (WHO 2015b)

The MoH is managing all public offer of health care including physical therapy (as mentioned before, the expression physical therapy includes physiotherapy, occupational therapy and speech therapy) within national hospitals, provincial hospitals, referral hospitals, health centers and post health centers. Central ministry supervises national hospitals, provincial hospitals are at the provincial level, and operational district level runs referral hospitals, health centers, and health posts.

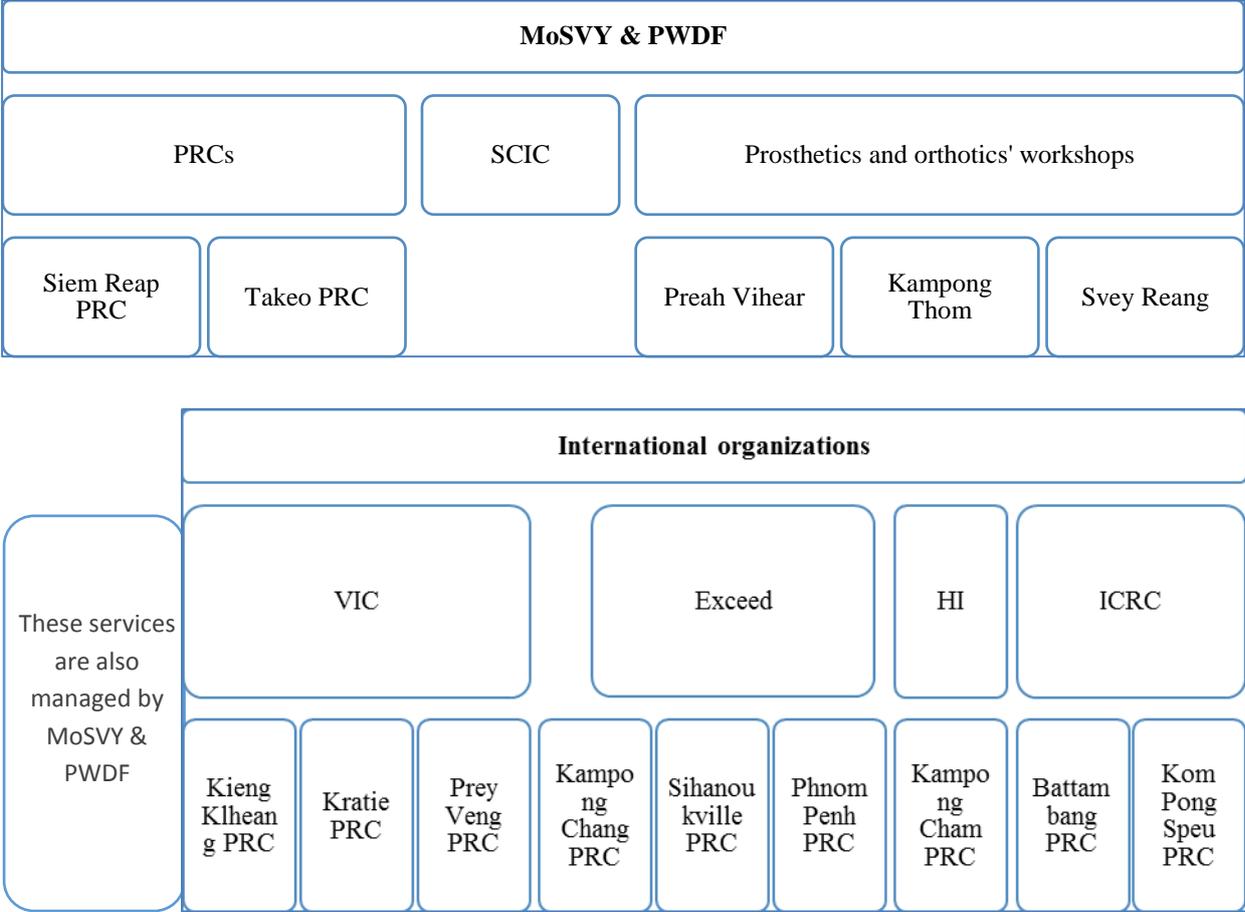
There are pluralistic health systems as there is a variety of public and private providers for health care that are not controlled by national health authorities. Because of very low government salaries of the health workforce, it is very common that health professionals have a dual practice; usually they work in both public and private sectors. Consequently, there is high absenteeism, poaching of patients to the private sector, etc. it thus affected the credibility of public health facilities in the eyes of the public, and contributed to lack of sources of revenues for the government (Meessen and al. 2011).

According to WHO (WHO 2015b), private practitioners remain particularly frequented for curative care. WHO estimated that 15% of primary care consultations occur in the public sector in rural areas. This result is quite problematic for the government of Cambodia because it means that there is a dysfunction in the patients' referral system as people are seeking care mostly in rural areas and leave the public sector for the private facilities.

3.2. Management of rehabilitation services supply

As mentioned before, some rehabilitation services depend on the Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY) responsibility, see Figure 19. There are also physical therapy and prosthetics and orthotics services within 11 physical rehabilitation centers (PRCs), 1 orthopedic component factory (OCF), 1 spinal cord injury center (SCIC) and 3 repair workshops. These rehabilitation facilities are also under international organizations' technical and financial management. Indeed, People with Disabilities Foundation (PWDF) under MoSVY manages Siem Reap PRC, Takeo PRC and SCIC; while international organizations managed Kieng Klheang, Kratie, Kamong Chang, Sihanoukville, Phnom Penh, Kamong Cham, Battambang, and Kampong Speu PRCs.

Figure 17 : Rehabilitation services under MoSVY/PWDF and international organizations



Source: Author

Within the framework of the 1995 Health Coverage Plan, the services delivered at government facilities are regulated under guidelines produced by the MOH that define a Minimum Package of Activities (MPA) for Health Centers and a Complementary Package of Activities (CPA) for Referral Hospitals (Ministry of Health 2006; 2007; WHO 2015b). In principle, the MPA and CPA packages include diagnosis, treatment, prevention, health promotion and rehabilitation, and physical therapy is included in packages (Ministry of Health 2007).

However, an implementation gap exists for physical therapy services. Indeed the number of functional physical rehabilitation services is still low (50 potential public physical therapy services available and around 62 physical therapy services if we include those from PRCs, in 2016) and not fully integrated into other health services for an effective continuum of care. Some efforts to improve this important aspect have been made but have not been scaled up

yet and do focus on specific conditions (example: development of referral guidelines for stroke management, from acute care to rehabilitation).

There are opportunities to expand the offer of physical rehabilitation services and tackle issues related to financial access within the health system thanks to the Complementary Package of Activities (CPA) policy and the current Health Strategy.

The Health Strategy 2014-2018 (Ministry of Health 2015d) has five components: health service delivery, health care financing, human resources or health, health information system, and health system governance. In order to strengthen the rehabilitation system, a comprehensive strategy taking into account all these components should be developed. According to HI and the Cambodian Physical Therapy Association (CPTA) (source: meetings), physical therapy should be present as per MoH guidelines. At present, only 20% have physiotherapy. In hospitals, where a physiotherapist is located, the therapist is working more as an administrator or nurse assistant as opposed to conducting therapy. Therefore, even if physiotherapists work at the public hospitals, physiotherapy cannot be fully practiced by professionals and thus quality of services provided is not satisfying. Recruitment strategies should be in place (incentives, support for continuing professional development, etc.) and a monitoring system to ensure that a physiotherapy department is present and functioning with treatment protocols, documentation, referral mechanisms, and involvement in multidisciplinary meetings. The CPTA could take the lead to work with the MoH and define job descriptions so that therapists are assigned tasks relevant to their profession including having a nationalized salary scale for working in such structures. This can also include the incentive strategies as mentioned above.

According to a GIZ study (GIZ 2015), the public health system is not well equipped to meet the needs of person with disabilities, or to diagnose and treat impairments that could lead to disability. They also mentioned that access to health care for people with disabilities include high direct and indirect cost, and they face other barriers such as physical inaccessibility of health facilities, communication barriers and negative attitudes from health workers.

3.3. Availability of rehabilitation services

3.3.1. Public rehabilitation services

Physical therapy services

According to the department of Preventive Medicine of the Ministry of Health, there are 10 National Hospitals, 24 Provincial hospitals, 77 Referral Hospitals, 1,084 Health centers and 53 health posts included in the health system. Each national hospital and provincial hospital has a physical therapy service; it thus represents 34 potential public physical therapy services.

According to CPTA, there are also some physical therapy services in other level of the sanitary pyramid. Some small services exist in 17 referral hospitals (including 2 in Phnom Penh), and in 1 Charity hospital in Banteay Meanchey province (Cambodia Japan Friendship hospital), and in one health center in the same province. According to their figures, updated in December 2016, it represents 50 potential public physical therapy services available in the country, with 5 National hospitals (Phnom Penh), 24 Provincial hospitals, 17 Referral Hospitals, 1 Charity hospital, 1 health center, and Bunnary Hun Sen Roka Koang RH and Pea Raing Operational district office. Including PRCs (11) and SCIC (1), the total number of physical therapy services (public and IOs) is around 62 in Cambodia in 2016.

Two separate physiotherapy standards for PRCs and hospitals (including guidelines and package) currently exist in the country, one developed by MoSVY (Ministry of Social Affairs Veterans and Youth Rehabilitation 2012) which has not been fully implemented yet (Bailey 2016), and another one developed by the MoH (Ministry of Health 2011). Several meetings and workshops are going on since 2015 between key stakeholders of the rehabilitation system (ICRC, HI, CPTA, WHO, UHS-MoH, PWDF-MoSVY, etc.) in order to develop a new standards document that merges both documents. The final version of the PT standards, endorsed by MoH and MoSVY, is expected in 2018.

Prosthetics and Orthotics services

As previously mentioned, there are There are 11 Physical Rehabilitation Centers (PRCs) which provide prosthetics and orthotics (P&O) service, three repair workshops and an Orthopedic Component Factory (OCF) which sells components to PRCs. These P&O services are thus provided to the population only at PRCs' level.

The MoSVY and the 5 concerned IOs/NGOs (ICRC, HI (HIB and HIF before), VIC and Exceed) signed aforementioned MoU in order to support the gradual handing over of PRCs to

the Ministry. At the end of 2010, Handicap International Belgium (HIB) handed over the responsibility of Siem Reap and Takeo PRCs to the Provincial Department of Social Affairs, Veterans and Youth Rehabilitation (PoSVY). But, HIB definitely stopped its financial and technical support to Takeo PRC in beginning of 2012, and to Siem Reap PRC one year later. PWDF has now the technical and financial responsibility of both PRCs. In addition, Kien Khleang, Kratie and Prey Veng PRCs were handover from VIC to PWDF in 2013, but with a continuous support (technical and financial) from VIC that haven't stop in 2016.

P&O standards are included in MoSVY's Guidelines on Physical Rehabilitation in Cambodia (Ministry of Social Affairs Veterans and Youth Rehabilitation 2012). To date, no revision of P&O standards has been done by the government, and none is planned for the future.

Box 4: Assessment of the technical level of a sample of public rehabilitation services

As part of a field mission, we conducted an evaluation of a sample of 11 rehabilitation facilities which provide physical therapy and/or prosthetics and orthotics (P&O) services in Cambodia. The sample contains 5 physical rehabilitation centers, 5 Hospitals (physical therapy units) and the Spinal Cord Injury Center (SCIC). We assigned a score from 0 to 100 according to the quality of the service⁸.

This assessment revealed that a majority of physical therapy services (6 out of 11) and prosthetics and orthotics services (3 out of 5) have a high score which means that they meet a minimum operating level of service delivery, not that they provide high quality services. We always observed a higher technical level of physical therapy service in physical rehabilitation centers (PRCs) in comparison to hospitals. PRCs under PWDF management (public) are at the bottom of the classification. Difference of service delivery's quality may be explained by the lack of equipment and/or lack of sufficient funding in government services. Reasons advanced by the government to explain differences between PRCs' and hospitals 'services refer to the lack of negotiation between non-governmental organizations and MoSVY/PWDF before the handover. According to them, the handover was too fast, and the financing capacity of the government was too weak to deliver the same quality as NGOs used to provide in the past (Boisgillot 2017).

We assumed that one limit of this assessment is the lack of ponderation for health facilities according to the volume of their activity.

⁸ Details of the questionnaire and the scoring are available in Annex. We assume that the score remains an estimation of the situation as assessed by the surveyor but however, provides a reliable overview of the technical level of each service in the country.

3.3.2. Private rehabilitation services

There are few figures available for the private sector. The 4th CDHS (National Institute of Statistics, Directorate General for Health, and The DHS program 2015) estimated the percentage of ill or injured population who sought treatment by place of treatment, according to urban-rural residence (Figure 20). They found that the private sector is the most popular source of treatment before the public sector for first, second and third treatment. 67.1% of people go to the private sector for first treatment, while 21.9% go to the public sector.

Figure 18 : Percentage of ill or injured population who sought treatment

Place of treatment	Residence						Total		
	Urban			Rural			First treatment	Second treatment	Third treatment
	First treatment	Second treatment	Third treatment	First treatment	Second treatment	Third treatment			
Did not seek treatment	3.9	71.5	88.5	5.1	79.2	93.9	4.9	77.8	92.9
Public sector	14.9	4.0	1.3	23.5	4.8	1.4	21.9	4.7	1.4
National hospital (PP)	6.5	2.2	0.9	3.6	1.0	0.5	4.2	1.2	0.5
Provincial hospital (RH)	2.2	0.2	0.1	3.1	0.6	0.1	3.0	0.5	0.1
District hospital (RH)	0.5	0.4	0.0	2.9	0.7	0.3	2.5	0.7	0.2
Health center	5.0	1.1	0.4	12.8	2.2	0.5	11.4	2.0	0.4
Health post	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0
Outreach	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other public	0.7	0.1	0.0	0.8	0.2	0.1	0.7	0.2	0.1
Private sector	78.1	23.9	9.9	64.7	14.5	4.3	67.1	16.2	5.3
Private hospital	3.3	1.0	0.2	3.6	1.0	0.3	3.6	1.0	0.3
Private clinic	22.6	6.7	2.4	17.2	5.0	1.3	18.2	5.3	1.5
Private pharmacy	40.6	13.4	6.1	12.7	2.2	0.8	17.8	4.2	1.8
Home/office of trained health worker/nurse	5.4	1.6	0.4	14.4	3.7	1.0	12.8	3.3	0.9
Visit of trained health worker/nurse	4.7	0.9	0.6	15.0	2.2	0.8	13.1	2.0	0.8
Other private medical	1.5	0.4	0.2	1.7	0.4	0.1	1.7	0.4	0.1
Non-medical sector	1.0	0.4	0.2	5.3	1.1	0.3	4.5	1.0	0.3
Shop/market	0.7	0.2	0.1	4.3	0.5	0.1	3.6	0.4	0.1
Kru Khmer/magician	0.3	0.1	0.1	0.9	0.6	0.1	0.8	0.5	0.1
Monk/religious leader	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Traditional birth attendant	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Outside of country/other	2.1	0.2	0.1	1.5	0.3	0.1	1.6	0.3	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,755	1,755	1,755	7,902	7,902	7,902	9,656	9,656	9,656

Source: 4th CDHS, 2015

Physical therapy and prosthetics and orthotics

According to the Ministry of Health, and the Hospital Services Department 2014, they estimated that the number of physical therapy private services is stable from 2011 to 2014, and it is around 20. We do not have data on distribution of these services. The number of private clinic increased from 110 in 2011 to 181 in 2014, it represents a 39% augmentation. Private hospitals are implemented in Cambodia since 2012 with 4 facilities; and in 2014 11 private hospitals were implemented. As far as we know, there is no private facility that provides prosthetic and orthotic service to Cambodian patient. Only physical therapy and speech therapy are concerned.

Speech therapy

According to OIC Cambodia, a Cambodia-based charity working to help Cambodians with communication and swallowing disabilities, there is 1 out of 25 people who need speech therapy in Cambodia, it represents approximately 600,000 people. Based on the figure of 20 speech therapy clinics, it results in a ratio of 1 speech therapy service for around 30,000 persons who need speech therapy, if we assume one speech therapist per service. It is obvious that this ratio is far from being satisfying compared to people needs in Cambodia.

In the private sector, some recent clinics provide speech therapy services such as Happy Kids Clinic in Phnom Penh. This clinic is one of the few that include speech therapists recognized by international standards, but they are foreign speech therapists. OIC Cambodia has been running this clinic since June 2016 and provides high quality services for Cambodian children that belong mainly to the upper high economic class. De facto, there is no local speech therapist in Cambodia.

Other private clinics in Phnom Penh provide “speech therapy services” but only short trained physiotherapists deliver this specific care to patients.

According to OIC there are 20 speech therapy services in Cambodia. A distinction is made between “recognized speech therapy services” (4), “speech therapy services with health workers trained by speech therapists” (6), and “speech therapy services with health workers who have received limited or no training by speech therapists” (10). Usually these health workers are nurses or physical therapists. Currently, there are 4 speech therapy services officially recognized and provided by foreign-trained speech therapists, and they are all based in Phnom Penh (Happy Kids Clinic, Indigo International, Véronique Messina, and Speech therapy Cambodia). The Happy Kids Clinic provides services solely for children.

3.4.Financial risk protection coverage for healthcare

3.4.1. General reminder

As presented in the first part of this thesis, the universal health coverage (UHC) corresponds to the provision of high-quality and essential services which concerns: health promotion, prevention, treatment, rehabilitation and palliation, and the protection of households from financial hardship including possible impoverishment because of out-of-pocket payments

(Cieza 2016). The UHC concept includes three dimensions: the health services that are needed, the number of people that need them, and the costs to whoever must pay patients and third party funders. Financial risk protection is an instrument of social protection, included in the universal health coverage. A wide coverage of financial risk protection may be done through various forms of prepayment. Achieve a wide coverage of financial risk protection may be done through various forms of prepayment for services, that will make possible to spread the financial risks of ill across the populations.

Social protection or social security is a set of policies and programs that aim to reduce poverty, and also to prevent people to fall (back) into poverty across the life cycle (Bastagli 2016; Chronic Poverty Advisory Network 2014). Thus, social protection intends to reduce poverty and smooth income and consumption over lifetime, and redistribute income and wealth within the population. To date it is commonly accepted that social protection programs have a high positive impact on poverty reduction, under some conditions such as minimum level of administrative and financial capacity, or political will (Bastagli 2016). A comprehensive social protection system will address all these areas with a set of mix contributory (e.g. social insurance) and non-contributory (e.g. tax-financed social assistance) schemes. In addition, there were some advances in improving the social protection coverage in many countries. But, efforts made to build these systems, including social protection floors, remains limited and not fast enough compared to the needs (International Labor Organization 2017).

According to the literature, key principles are highlighted from countries experiences in the implementation of universal health coverage schemes. Recurrent problems observed in these mechanisms are several. First, affordability of health service is a key element because it has an effect on access to care and on financial protection. Evidence base suggests that interventions that focused on the improvement of affordability are necessary for UHC schemes, but it is not sufficient to achieve the UHC. Secondly, when extending coverage of UHC schemes to the non-poor, it is observed that moral hazard may effects, as usually, common UHC schemes are less effective for the non-poor. Thirdly, another intuitive element is the necessity to align population needs for healthcare with benefits of UHC schemes. Evidence showed that countries with a misalignment between benefits and population needs have more difficulties in achieving UHC scheme specific goals. Finally, highly focused interventions have shown positive effects on access and financial protection; but these kind of

interventions present satisfying results only if they are transitional or an initial step toward the UHC (World Health Organization 2013b).

Some countries present several social protection mechanisms with schemes for certain population groups such as pregnant women, people with disabilities, veterans of war, etc., for poor regions, or to certain types of facilities.

These mechanisms are often associated with free health care policies and they are sometimes in complements of a social health insurance scheme. This fragmentation of mechanisms conducts to the health financing system fragmentation. When many free health care policies are implemented within a country it may create disincentives for people to enroll health insurance schemes that include more advantageous benefits (Mathauer, Mathivet, and Kutzin 2017). As mentioned by ILO (International Labor Organization 2017) we also observed in some countries problems related to stratification, lack of articulation and coordination between programs and institutions of the sector. As a result, administrative and financial burden are recorded

The minimum package of services covered in universal health coverage schemes often left out rehabilitation services. Physiotherapy services are sometimes included in the minimum package of services when services are available in the public health system. However, we are far from observing the same situation for prosthetics and orthotics services, as well as for occupational therapy or speech therapy, which are most often paid from patients' personal funds or free-health care policies if they exist.

3.4.2. Financial risk protection for health care coverage in Cambodia

Since 2005, the Ministry of Health and the Belgian Technical Cooperation have implemented several health financing schemes. This includes health equity funds, vouchers and performance-based financing to improve access to basic health services for the population, especially the worse-off.

Within this framework, the government works in close collaboration with IOs to implement a social health protection scheme for Cambodian people, even if this system is at an early stage of development. There is a variety of social protection schemes in Cambodia: National Social Security Fund (NSSF), the National social security fund for civil servants (NSSF-CS) both,

the Social Health Insurance (SHI) both managed by the government, voluntary health insurance (community based health insurance (CBHI) and private companies), Health Equity Funds (HEFs), Government subsidy schemes (SUBO), Vouchers schemes and, other experiences (innovative fundraising and parallel health systems). To determine if a household is poor and thus eligible for some schemes, the Ministry of Planning has developed an identification tool for the poor that provides an “id poor card”, the Cambodian Identification of Poor Households Program (IDPoor).

3.4.3. Cambodian Identification of Poor Households Program

The Cambodian Identification of Poor Households Program, IDPoor, is a community based poverty identification system. It is a pro-poor mechanism managed by the Ministry of Planning (MoP) since 2005, with support from GIZ, the Australian Government, the European Commission and UNICEF. Since 2014, GIZ is supporting the MoP in developing a complementary tool to identify poor households in urban areas (Malli and Doetinchem 2016). IDPoor aims to standardize the identification of poor people in rural areas through an approach to poverty scoring. Currently, Cambodian government manages routine IDPoor operations for rural areas as a fully government-owned program. This social registry is becoming one of the building block in the National Social Protection Policy framework and the universal health coverage (Kaba and al. 2018).

The process consists in the dissemination of a 9 pages questionnaire with more than 30 questions that lead to around 11 scored indicators. The total score conducts to poverty categorization that matches with local perceptions of poverty (Schreiner 2015). A household is classified as “Poor Level 1” or “Very poor” if its score is [59-68], as “Poor Level 2” or “Poor” if its score is [45-58], and households with score of 44 or less are classified as “Others” or “Non-Poor”. Some questions are not scores in order to help detect cases for possible overrides (Ministry of Planning 2009).

The MoP delegates to villagers the identification of people who live in poverty in their community. Villagers designate a Village Representatives Group (VRG) who is then trained to conduct interviews. VRG conducts household’s interviews and develops a draft list of poor households using both poverty scores and non-scored items. They then discuss about exceptional cases in the VRG, allowing overrides of up to 10 percent of classifications based

on information from non-scored items and local knowledge of circumstances and modify the list. The Commune Council, VRG and key community members review the modified list, and display in the village the draft list of poor households. A formal meeting with villagers is then organized to identify possible misclassifications. They prepare a revised list and display it again before submitting to the Commune Council for a final review and resolution of pending override requests. Documents are then sent to the Provincial Department of Planning for data entry and photographs of all poor households are done. Finally, “Equity cards” are prepared and distributed to poor households identified (Schreiner 2015).

This process encourages transparency and accuracy of results. The IDPoor process takes place in 8 provinces each year, and GIZ estimates that in each round 35,000 persons are actively involved from national to provincial and community levels (Malli and Doetinchem 2016). For example, in 2015 (year that corresponds to ‘round 9’), 9.9% of households per village in Phnom Penh province were classified as poor (level 1 and 2 combined), while in Kampong Cham province, 18.1% of households were classified as poor (Ministry of Planning 2015). The identification of the poor is very important for the government in order to propose to the population appropriate and relevant protection schemes against financial risk associated with health services utilization.

Households identified as poor, received an “Equity card”, commonly called “IDPoor card”. These cards include a photograph of household members, a household code, the household’s poverty level, the card’s validity period, and general information on how to use the cards. In 2011, the government confirmed to use the standardized procedure for defining poor households. Data are collected in all provinces and updated every three years. Over 12,000 villages in rural areas (around 90% of all the villages in the country) have applied. Approximately 776,000 Equity Cards (identity cards) have been issued to poor households⁹ which represent 4.98% of the population. With this card, households have access for free to a range of public services and some organizations services (Papenfuss 2013). In public services, access to free services is financed by MoH through HEFs for the poor. Apart from the health sector, the IDPoor card includes other non-health related benefits such as education scholarships for boys and girls, income support and cash transfer programs, or access to public works programs (Malli and Doetinchem 2016).

⁹ <https://www.giz.de/en/worldwide/17300.html>

However, there are some risks inherent in the IDPoor process. First, there is a risk of exclusion of the poor if they are not targeted by the program in spite of government's efforts. Secondly, another issue may be a non-relevant inclusion of people, intentional or not. Nevertheless there is a lack of data available on this topic.

3.4.4. Social health insurance

Social health insurance is still an ongoing project. It will be implemented by NSSF and NSSFCS for the formal sector workers and civil servants. Benefits and services are not yet defined.

National social security fund (NSSF)

According to GIZ (Hennicot 2012), in September 2002, the Cambodia Parliament adopted the Social Security Law¹⁰ for employees working in the private sector. It stipulates introduction of a contributory social insurance system in case of retirement, invalidity, death, and other circumstances including sickness. In addition, this law requires private enterprises that employ 8 or more worker to register with the National Social Security Fund (NSSF) and pay compulsory premiums. But, since November 2017, two Prakases¹¹ or ministerial directives, signed by the Ministry of Labor and Vocational Training, have extended the NSSF (occupational risk and health care schemes) to all enterprises employing as few as one worker.

In November 2008, the NSSF started. It finally provided compensations to victims of employment injuries and occupational diseases in Phnom Penh and 17 out of 24 provinces. By 2012, the Fund covered 6,107 enterprises with 847,165 workers. But, WHO estimated that almost 15% of enterprises registered failed to pay the contribution.

Initially a compulsory health insurance scheme through the NSSF was scheduled to begin in 2013, but it was first postpone to 2014 and then further postponed for the years to come. The scheme will use a simple case payment method for services delivered at government hospitals and health centers.

Compulsory premiums to NSSF equal to 0.8% of gross salary. Since 2011, employers are required to pay the all total of 0.8%.while before 2011, they payed 0.5% and the government payed the 0.3% left.

¹⁰ Royal Kram NS/ RKM/0902/018

¹¹ Ministry of Labour and Vocational Training NO. 448/LV/PRK.NSSF

In 2013, NSSF took control of a CBHI project, the Health Insurance Project, for garment-industry workers in Phnom Penh. It covered 7,773 employees in 11 companies in 2013, which represent less than 0.05% of the population.

National social security fund for civil servants (NSSF-C):

A Royal Decree was adopted in 2008 to establish the National Social Security Fund for Civil Servants (NSSF-C) to administer a range of social security benefits for public-sector. ILO estimated that around 675,000 persons potentially benefit from this security fund, based on 2010 data. It includes 175,000 civil servants, family dependents of civil servants and public sector pensioners benefit from survivors' pensions in case of death of the civil servant or pensioner. The estimated coverage of NSSF-C represents 5% of the population.

The Royal - Decree on the Establishment of Social Security of Employment Injury for Public Officials and Health Care for Public Officials, former Civil Servants and Veterans (February 2017) stipulated that public employees, former civil servants, are entitled to health care benefit during sickness including curative and preventive care. It includes inpatient, outpatient, birth delivery, prenatal and postnatal care, physiotherapy, rehabilitation services, and emergency.

This fund is financed through salary contributions at 24 % of civil servants' salaries. The government pays 18% and civil servants 6%. However, according to ILO (International Labor Office 2012), there is a lack of transparency about how contributions are collected. The issue is related to the capacity of the contributions to cover benefit expenditures. And a question also remains regarding the collection of contributions, whether they come from salary allowances or from basic wage only.

Voluntary health insurance

The voluntary health insurance market is small and the provision of voluntary health insurance is limited and has only two types, private health insurance and community based health insurance (CBHI). Total revenues from all private insurance premiums increased from about \$4 million in 1998 to \$20 million in 2009. Revenues for health insurance totaled \$2.7 million or 13.8% of total insurance premiums (WHO 2015b).

Private health insurance

For-profit private companies propose voluntary private health insurance. They play a supplementary role in providing a choice of provider for Cambodians as some propose to cover the private sector. There is no official data about these private companies.

Voluntary community-based health insurance (CBHI)

CBHI was introduced in Cambodia in the mid-1990s to provide low cost insurance for poorest families (Ensor and al. 2017). It is organized at community level, aimed at near-poor informal sector workers who can afford small, regular premium payments. It is managed by NGOs and targets mainly people of the informal sector living above poverty line. Benefits and services cover MPA and CPA, food transport and funeral expenses. Providers are paid with capitation, case-based payment, or fee-for-services mechanisms. 19 schemes exist with 17 in Regional hospitals, 1 National hospital, and 240 health centers. It represents coverage of 455,648 persons or around 3% of the population (WHO 2015b) and less than 10% of communes (Ensor and al. 2017).

Premium rates vary from \$5 to \$15 per person and per year with a reduction of the price for larger families. It is estimated that these rates are affordable for poorer families living above the poverty line. In addition, there is no waiting period precondition for insured beneficiaries.

In average, CBHI's members experience a reduction in health costs and health shocks by more than 40%, and they have 75% less health related debt, and increase the use of public health facilities (Levine, Polimeni, and Ramage 2016).

Health equity funds (HEFs)

HEFs have been jointly funded by government and donors. It is a pro-poor health financing scheme, and it targets pre-identified poor households through the Cambodian Identification of Poor Households Program (IDPoor). For these identified households, MPA and CPA services are provided for free and the HEF directly pay back the facility. In addition, in-patients beneficiaries perceive additional benefits such as travel and food allowances (Itay and Hay 2012).

Table 18 presents the coverage of health equity funds from 2008 to 2014, according to MoH figures. 1 National hospital, 51 Referral hospitals and 458 Health centers are covered and HEF covers 76% of the targeted and around 20% of the national population (WHO 2015b).

Table 18 : Coverage of government’s health equity funds from 2008 to 2014

	2008	2009	2010	2011	2012	2013	2014
National Hospital							1
Number of Hospitals	44	53	57	63	65	68	63* 11**
Total Hospitals							81
Number of Health Centers	101	141	291	302	385	516	602* 57**
Total Health Centers							659

* HEF schemes financed by National budget and development partners

** Subsidy schemes of the government (SUBO financed by National budget)

Source: Department of Planning and Health Information System, MoH, 2014

HEF is the mechanism with the greatest coverage (Ensor and al. 2017). Some studies highlighted that HEFs reduce household OOP payments by 29% in average, and households’ health-related debt by around 25% on average (Flores and al. 2013). Other studies show that HEFs stimulated the use of hospital services by the poor and improved access to health care services of the poor (Hardeman and al. 2004; Noirhomme and al. 2007).

Government subsidy schemes (SUBO)

SUBO was established under Prakas 809 in October 2006 and it is a limited form of HEF. It is managed and implemented by MoH, Operational district and Provincial health department. Government facilities are reimbursed by MoH for patients fee exemptions of poor patients, but food and travel costs are not covered. Provider payments are on a fixed-case basis, but as there is no effective monitoring system and irregular reimbursement processes, health care providers show little commitment.

SUBO concerns poor people living below the national poverty line, and it covers MPA and CPA services. SUBO is implemented in 6 National Hospitals, 11 Referral hospitals and 57 health centers. Between 2011 and 2012, coverage and care utilization fell dramatically and a report mentioned that SUBO schemes could be merged with HEFs (Men and al. 2011).

Vouchers schemes for reproductive health

Vouchers schemes have been introduced in Cambodia in 2007 and cover costs of family planning, antenatal, delivery and postnatal care, as well as reimbursement of transport to reach the facility (Brody and al. 2013).

WHO (WHO 2015b) estimated that nine operational districts, and four private clinics are concerned and it covers 255,324 women. Van de Poel and al. (Van de Poel and al. 2014) found that voucher schemes increase by 10% the probability of delivery in a public health

facility, and these schemes are associated with 5.3% increase in post-natal care but there is no impact on antenatal care; and the effect is greater for the poorest households. Some vouchers schemes target the poor while some other provide benefit for all (Ensor and al. 2017). It seems that schemes that not targeted a part of the population have a larger effect on facility delivery than those that targeted (Ensor and al. 2017).

3.4.5. Other experiences

Innovative fundraising

There is no exhaustive list about all innovative fundraising within the country, but some initiatives do exist. For instance, the development agency GIZ revealed that in Kampong Svay district, during the money flower ceremony at Bendei pagoda, \$3,289 were donated by the community to enable the most vulnerable members (people with disabilities and older persons) to visit a doctor when falling ill (GIZ 2016). The money was then donated to finance motorbike drivers to bring these people from their home to the health center. Other communes copied this initiative, such as Meanchey, Kdei Dong and Tbong Krapeu, which cooperate with pagodas to support transport for people with disabilities and older persons.

Parallel health systems

Some local and international NGOs provide health services outside the government system such as the Kantha Bopha chain of children's hospitals or the Sihanouk Hospital Center of HOPE in Phnom Penh.

Pension scheme for people with disabilities

A 2015 'prakas' stipulated that people with disabilities and older people who are the poorest for all levels of the health facilities are entitled to health services free of charge. It also specifies that health facilities need to take care, provide treatment by applying the health equity fund of the government in order to strengthen and improve the quality of services in Cambodia. For instance, these persons are exempted from the standards user fees levied at health facilities. The 'prakas' has been poorly disseminated and it is not systematically implemented because it required that health facilities cover their fees (GIZ 2015). People with disabilities have the possibility to cumulate several social protection schemes. For instance, a person with disability identified as poor through the IDPoor program can benefit from a

pension scheme of MoSVY. The sub-decree n°137 from June 2011¹² on Policy Supporting/Pension scheme Poor People with Disability in community (Ministry of Planning 2011) aims to reach “people with disabilities absolutely poor, old desolate with serious disability”. Objectives of this law are the following:

- To implement the law on protection and promotion of the right on people with disability
 - To contribute to the National Strategic plan in reducing poverty
 - To support the emergency aid to people with disabilities in poor communities
 - To rehabilitate and enhance livelihood of people with disabilities in poor community
 - To prevent and reduce risky migration of people with disabilities in community
 - To reduce people with disabilities from being vagabond people and beggars
 - To provide social service more effectively to people with disability disabilities
- table 19 below presents modalities of the pension scheme for poor people with disabilities according to their type of disability. The amount of the support budget is \$5 per month for a period from 3 months to 12 months, depending on the severity of their disability (light, medium or serious).

Table 19 : Pension scheme for people with disabilities

No	Type of Disability	Period			Supported budget
		Light	Medium	Serious	
1	People with serious disability, absolutely poor and being desolate	3 months	6 months	12 months	5USD
2	Old people with disability, poor and being desolate	3 months	6 months	12 months	5USD
3	PWD who have serious injury, very poor and being desolate	3 months	6 months	12 months	5USD

Source: Sub-decree n°137, MoSVY, 2011

‘People with serious disabilities, absolutely poor and being desolate’ (No 1) who will come to a PRC will receive free rehabilitation services, food allowance for 3,000 Riels (\$0.74) per day during the all treatment, and a travelling allowance to go and come back for 10,000 Riels (\$2.47), financed by PWDF. Otherwise, ‘people with serious disabilities and poor and people with disabilities who are poor and being desolate’ (No 2 and 3) who will come to health centers and nearest hospital will be provided financial support from PWDF for 30,000 Riels (\$7.41) a year.

¹² 137 ANKr.BK

3.4.6. Summary of social protection schemes

Table 18 summarizes existing social protection schemes, and specifies the operator, covered services, premiums, coverage and targeted population. The study of Cambodian social protection mechanisms highlights some recurrent issues and common assets.

Several points of convergence are highlighted between these social protection mechanisms. First, the social protection system is very fragmented, each scheme target a specific part of the population, and management of these mechanisms are operated by various ministries and non-governmental organizations.

We noted a limited coverage of the population mainly due to a poor targeting of the population. For instance, mandatory health insurances are only for workers in the formal sector and public employees.

Physiotherapy in public health service is most of the case include in the benefits of social protection schemes. However, the financial coverage of prosthetics and orthotics services are only include in NSSF/NSFF-C schemes and thus it concerns only a small part of the population, public and private workers in the formal sector. Nevertheless, even if physiotherapy included in some protection mechanisms, we saw before that in the health sector the quality of services provided is not satisfying.

Another common point raised by this analysis is the financial sustainability issue of these schemes. With a low enrollment, the capacity of collected contributions to cover benefit expenditures is questioned, as it is the case for NSSF-C. Identically, the question of the sustainability also arises for health equity funds, the community-based health insurance and other schemes mainly managed by NGOs.

Concerning the governance issues, there is a lack of coordination within the healthcare financial protection schemes with an unclear institutional responsibility, a lack of implementation capacity, some accountability issues, and a poor monitoring and evaluation. Several ministries or non-governmental institutions are managing schemes. This distribution of responsibilities is still unclear. The impact of existing schemes is limited by lack of coordination between operators of these schemes because each of them have their own social protection mandates and policy frameworks (Chadwick and Schmitt 2013). In addition, within the same scheme, several ministries managed reimbursement or provision of allowances. For

instance, for the NSSF-C, managed by MoSVY, provision of allowances are paid by the MoEF as a salary allowance (International Labor Office 2012).

Overall, the coverage of social protection remains low, in particular for rehabilitation care, even if efforts of the government are made to increase the proportion of the population covered and benefits. These efforts are disadvantaged by issues mentioned above. And de facto, the rest of the population who is not covered by NSSF and NSSF-C benefits from rudimentary and fragmented social protection coverage. This opaque and fragmented system in Cambodia does not work in the support of the implementation of rehabilitation policies.

Table 20: Overview of social protection schemes in Cambodia

Social protection schemes	Operator	Type	Covered services	Coverage of rehabilitation services	Premiums	Coverage	Target population	Summary	
IDPoor	MoP	Voluntary	Public health services and some IOs	PT services and P&O in PRCs	N/A	Rural households. No national data available. E.g. 9.9% of households per village in Phnom Penh are covered in 2015.	Eligible poor in rural areas	+ : All public health services including PT - : very limited coverage if we exclude poor households from statistics. Question: how many poor households are actually covered by IDPoor?	
Social Health Insurance	NSSF: Employment injury insurance* Healthcare Pension	MoLVT and MoEF	Fully compulsory Fully compulsory	Inpatient, outpatient, birth delivery, prenatal and postnatal care, physiotherapy, rehabilitation services, and emergency.	Rehabilitation services are covered.	Employment injury: 0.8% of worker's gross wage paid, Healthcare and pension: 2.6% of worker's gross wage	In 2012, it covered 6,107 enterprises but 15% of them failed to pay the contribution (WHO, 2012) In 2017, agreements have been signed with 1,273 local hospitals, including national hospitals, referral hospitals and health care centers, as well as 11 private hospitals / clinics (NSSF).	Formal sectors workers	+ : mandatory contribution - : limited coverage, only worker from the formal and private sector, poor excluded, rehabilitation?
						Salary contributions at 24 % of civil			In 2010, 675,000 persons (5% of the population) including
	NSSF-C	MoSVY							

Social protection schemes	Operator	Type	Covered services	Coverage of rehabilitation services	Premiums	Coverage	Target population	Summary
					servants' salaries with 18% paid by the government and 6% by civil servants.	pensioners and family dependents, spouse and children (International Labor Office 2012)	and their respective family dependants	servants is not clear
Private health insurance	For profit private companies	Voluntary	No data	No data	Various	No data	All individuals who want to subscribe	+ : complementary to existing mechanisms - : voluntary contribution Very few members, no information about the inclusion of rehabilitation.
CBHI	NGOs with the MoH	Partially contributory	MPA and CPA, food, transport and funeral expenses.	PT services in public sector	Small premiums	19 schemes exist with 17 in regional hospitals, 1 national hospital and 240 health centers (around 3% of the population)	Poor people in the informal sector	+ : Physiotherapy is include Target poor people - : managed by NGOs, low coverage
Health Equity Funds (HEFs)	NGOs with the MoH	Voluntary	MPA and CPA services; food, transport and funeral expenses	Physical therapy in public sector	N/A	HEFs covered 76% of targeted and around 20% of the population	Eligible poor and very poor.	+ : good coverage of poor people, physical therapy is included, as well as transport and food - : financial sustainability due to a majority management of NGOs
SUBO	Ministry of Health	Voluntary	MPA and CPA services	Physical therapy in public sector	N/A	6 national hospitals, 11 referral hospitals and 57 health	Poor people living below	+ : cover public health services, include physical therapy, target poor people

Social protection schemes	Operator	Type	Covered services	Coverage of rehabilitation services	Premiums	Coverage	Target population	Summary
						centers	national poverty line	-: not financially sustainable, and very low coverage
Vouchers (scheme complementary to HEF)	NGOs	Voluntary	Reproductive health services and transport expenses	Not covered	N/A	9 operational districts and 4 private clinics (around 255,324 women)	Poor pregnant women	+: Incentive to seek care -: sustainability, relevance, very limited coverage of service/population/area, does not include rehabilitation
Innovative fundraising	NGOs or communities	Voluntary	Various	Depending on the scheme	No data	No data	Poor people	+: target population usually left out or outside -: Sustainability, poor targeting
Parallel health system	NGOs	N/A	Health services outside the public system		N/A	No data	No data	+: target population usually left out or outside -: Sustainability, poor targeting
Pension scheme for people with disabilities	MoSVY	Voluntary	Free public health services, Support budget of 5\$ in a defined period according to the type of disability, Food and transport expenses	Physiotherapy services covered	N/A	No data		+: Target people with disabilities -: No information about the coverage rate

*It includes accident at work, commuting Accident, and occupational disease.

Notes: MoEF – Ministry of Economy and Finance; MoH – Ministry of Health; MoLVT - Ministry of Labor and Vocational Training; MoSVY – Ministry of Social Affairs, Veterans and Youth Rehabilitation; N/A – Not applicable, NGOs – non-governmental organizations, PT – Physiotherapy, P&O – Prosthetics and orthotics.

Source: Author

4. Financing rehabilitation and disability

4.1. Estimation of rehabilitation needs

According to Handicap International's estimations (Letourmy 2014), 2% of the population in developing countries is estimated as requiring rehabilitation care (all services); it represents around 311,558 persons in Cambodia. As there are 62 physical therapy services in Cambodia, we can estimate that each physiotherapy service should provide rehabilitation to 5,025 persons needing rehabilitation care in Cambodia.

The World Health Organization (WHO) and the International Society for Prosthetics and Orthotics (ISPO) (WHO and ISPO 2005) defined that 0.5% of the population in developing countries needs P&O devices. In Cambodia around 77,889 persons needs P&O devices¹³. Adding that there are 11 physical rehabilitation centers (PRCs), we estimated that each PRC should provide services to 7,080 persons in need of a P&O device.

However, observed activity in PRCs is far from satisfying demand of services. For instance, if we take into account the estimated P&O needs per service in Cambodia (7,080 persons) and we compare it to the activity of Kampong Cham PRC (2,200 persons) it represents a gap of 4,880 patients. If the 11 PRCs have a similar activity (24,200 patients per year in total), 68.93% (53,689 persons) of persons who need prosthetics and orthotics will not have access to devices.

4.2. Financial situation of health and rehabilitation in Cambodia

4.2.1. Overview

According to National Health Accounts (NHA) 2012-2014 data (Ministry of Health 2016), total health expenditure (THE) amounted to more than \$1 billion over the period, with around 20% from the government, 20% from donors and 60% from out-of-pocket (OOP) payments over the period (Ministry of Health 2016). In 2012, THE amounted to \$1,032.7 million, \$1,063.5 million in 2013 and \$1,057.2 million in 2014.

¹³ Based on 2015 population data equals to 15,577,899 (World Bank 2016e)

The following table presents 2014 data from national health accounts 2012-2014 (Ministry of Health 2016) compared to the World Bank and WHO data, and to East-Asia & Pacific countries' and low- and middle-income countries' (LMICs) data.

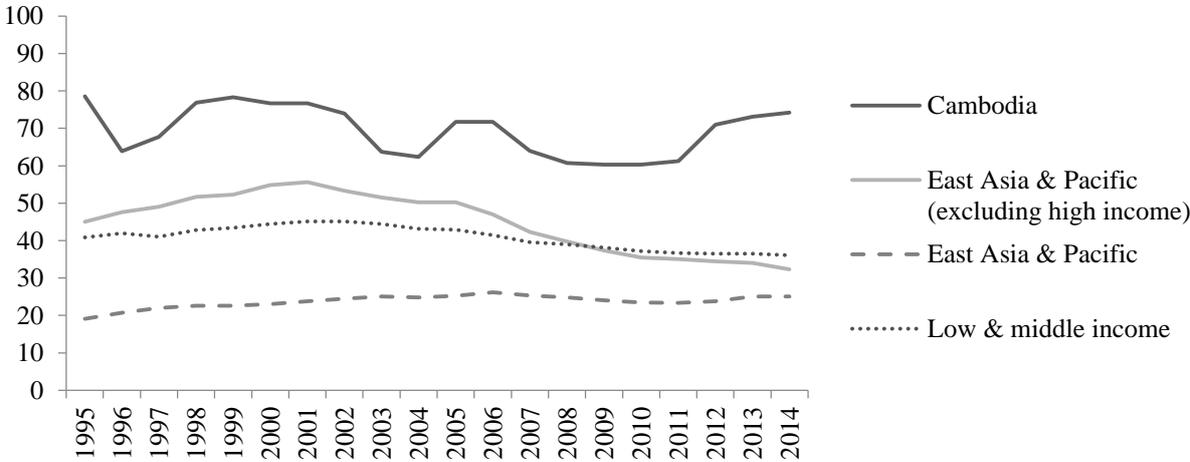
Table 21 : Financial health system indicators in Cambodia, LMICs, and East Asia and Pacific regions, 2014

	Cambodia (World Bank, WHO data)	Cambodia, (RGC data)	East Asia & Pacific	East Asia & Pacific Excluding high income countries	LMICs Average
Total health expenditure in % of GDP	5,68%	6,30%	6,89%	5,33%	4,50%
Total public health expenditure % of THE	22,04%	19,90%	66,21%	55,71%	36,40%
Health expenditure per capita (current US\$)	\$ 61,29	\$ 67,87	\$ 643,43	\$ 333,91	\$ 90,00
OOP in % of THE	74,20%	62,30%	25,08%	32,33%	55,70%

Source: Author, based on World Bank, WHO and Ministry of Health data, 2014

The share of out-of-pocket payments (OOPs) in percentage of total health expenditures over the period 1995-2014 is higher in Cambodia than in East Asia and Pacific countries' and LMICs' average (Figure 19). In Cambodia almost 75% of total health expenditures arose from direct payments of patients in the health system. A predominance of this type of financing is not recommended by the international community as it is not sustainable and it leads to a non-resilient system, which is a high risk for the population.

Figure 19 : Evolution of out-of-pocket as a share of THE between 1995 and 2014 in comparison with East Asia and Pacific and Low and Middle Income countries



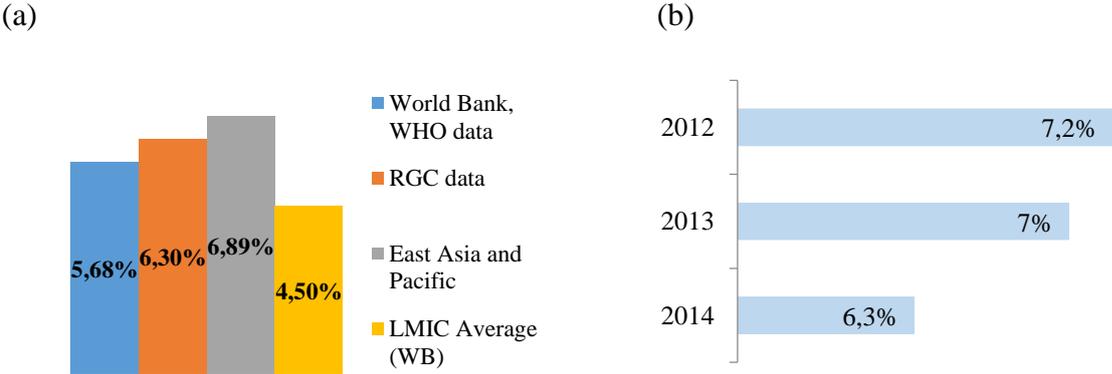
Source: Author, based on World Bank data.

Compared to its neighbors, Cambodia has a very high level of OOP, even if we exclude high income countries in the analysis. This level of OOP is extremely high in the country, with a clear mismatch between government and international institutions’ data (almost 12 points of difference).

The government of Cambodia has shown capacity to increase its budget on health as Cambodia knows an important and stable growth that allow an expansion of the fiscal space. Despite this positive trend, the level of investment in rehabilitation services has not increased.

The indicator “total health expenditures (THE) as a share of gross domestic product (GDP)” was higher in Cambodia compared to LMICs’ average and East-Asia and Pacific countries’ average (Figure 20). This indicator was 5.68% in 2014 according to the World Bank and 6.30% according to the government. If we look at government’s data, the trend slightly decreases over the period.

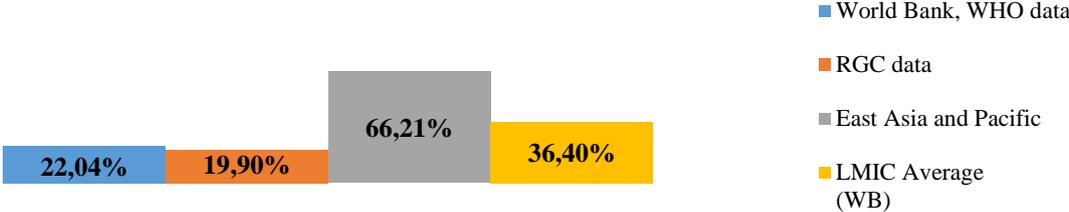
Figure 20 : (a) Comparison of THE as a share of GDP, 2014; (b) Evolution of THE as a share of GDP 2012-2014 in Cambodia, East Asia and Pacific region, and in LMICs



Source: Author, based on WHO, World Bank and MoH data.

For “total public health expenditures as a share of THE in 2014”, as before, there is a difference between international institutions and government’s data (minus 2.1 points of percentage). Public health expenditures in Cambodia are largely below regional’s (gap 46.3%) and LMICs’ (gap 16.5%) average (Figure 21). Effort could be made to increase the share of public budget in the health sector.

Figure 21: Comparisons of total public health expenditure as a share of total health expenditure in Cambodia, East Asia and Pacific region, and in LMICs, 2014



Source: Author, based on WHO, World Bank and MoH data.

4.2.2. Focus on public spending

According to the Department of Planning and Health Information of the MoH (Ministry of Health 2015a), the national budget recurrent spending within the health sector is estimated to \$193,127,442.2 with 64.88% in Central Health Units and the rest for Provincial Health Department, as it is shown in the table below.

Table 22 : National budget recurrent health spending in million USD, 2012-2014

	2012	2013	2014
Central health units	139.2	150.5	125.3
Provincial health department	48.3	57.6	67.8
Total for the Health sector	187.5	208	193.1

Source: Department of Budget and Finance, 2014.

National budget for Cambodia in 2014 was up to \$3.54 billion, while in 2015, the national budget was \$3.8 billion; no data is available about the unspent part of this budget. In 2016, the total budget was \$5 billion and the largest line item in the budget was “unallocated spending” for almost \$854 million. Therefore, about 17% of the budget was not spent for the year 2016. In addition to this unspent budget, there is a lack of transparency from the government and the end-of-year budget reports do not contain much information to do accurate analysis (Paviour 2016).

There is also a reserve fund of \$1.53 billion for 2014 (30.6% of total budget) which constitutes almost half of the total budget. There is no data found for 2016. This reserve fund is allocated to electricity subsidies, repaying loans, diplomatic missions and infrastructures projects, according to the Ministry of Finance. “But no more precisions had been done to

explain the ministries and institutions line that contains half of the fund” (Paviour 2016). This reserve fund decreased by almost 14 points of percentage compared to the year before.

Moreover, according to the World Bank, in 2008, public health expenditure as a share of general government expenditures was 7.1% and decreased to 6.8% in 2011 (World Bank 2011b).

There is no figure available for the share of rehabilitation and disability within the health sector. However, in 2014, ICRC estimated (Verhoeff 2014) that international organizations spent \$1,918,588 to support the 16 rehabilitation facilities (PRCs), which represents 69% of the total budget for these facilities (29% for PWDF). Total budget for these facilities is \$2,779,629, so it represents less than 0.1% of the total national budget and 0.18% of the reserve funds of the government, and as a share of the unspent budget it represents 0.33%.

4.2.3. MoSVY budget

The Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY) has two different budgets, one at central level and another one at provincial level, which is called Provincial Department of Social Affairs, Veterans and Youth Rehabilitation (POSVY).

According to Ministry of Economy and Finance (MoEF) meeting, MoSVY central level’s budget is estimated around \$16.5 million in 2016. Under central level, there is Persons with Disabilities Foundation (PWDF), Social Welfare Department and National social security fund (NSSF). In regards to affirmations of Social Welfare Department’s representatives, they declared a 2016 budget of around \$1 million and a cut of half million for 2017. PWDF has an estimated budget of \$1.5 million which represents around 10% of MoSVY central budget. There is no information for NSSF’s budget.

As defined by ICRC in 2013 (Verhoeff 2014), they calculated operating costs by source of funding of PRCs and they estimated that PWDF spent around \$797,110 so more than half of their total budget. There is no information available at PWDF level or at MoEF level, neither at provincial level.

No information is available on the rehabilitation budget, but some key actors meet during our meetings for the data collection, estimated that it is between \$3.5 and 4.5 million in Cambodia.

Financial support from PWDF to provincial rehabilitation centers (PRCs) managed by international organizations (IOs) is estimated to be from 5% to 30% depending on PRCs. We have details of the share of PWDF contribution for PRCs in 2013, as it is shown in the table 23. On average, PWDF contributed to 33.85% to PRCs and the rest was founded by IOS in 2013. The rehabilitation sector remains mainly support by international NGOs and investments from the government are still very weak. Travel costs and food for patients are provided through bilateral contribution with 35% from PWDF and 65% from IOs. Salaries top-up allowances are paid by IOs, as mentioned before.

Table 23 : Overview of Cambodia’s physical rehabilitation expenses split between PWDF and IOs

Managers	Facilities	Approximate expenses per partner in %	
		PWDF	IOs
ICRC	OCF	31,40%	68,60%
	PRC Battambang	15,84%	84,16%
	PRC Kompong Speu	19,03%	80,97%
	<i>Average share</i>	22,09%	77,91%
Exceed	PRC Kampong Chang		
	PRC Sihanouk		
	Clinic PP		
	<i>Average share</i>	11,88%	88,13%
Handicap International	PRC Kampong Cham	4,91%	95,09%
	<i>Average share</i>	4,91%	95,09%
VIC	PRC Kien Khleang	40,00%	60,00%
	PRC Kratie	26,23%	73,77%
	PRC Prey Veng	24,89%	75,11%
	<i>Average share</i>	30,37%	69,63%
PWDF	PRC Siem Reap		
	PRC Takeo		
	SCIC Battambang		
	Repair Workshop Svay Rieng		
	Repair Workshop Kampong Thom		
	Repair Workshop Preah Vihear		
	<i>Average share</i>	100%	0%

Source : Author, based on ICRC’s study (Verhoeff 2014)

4.2.4. Some examples of provincial rehabilitation centers’ budgets:

According to Battambang PRC’s MoU, agreed in June 2014, financial responsibilities are split into: 24% for MoSVY and 76% for ICRC, amount are respectively \$116,621 and \$370,436. In Kompong Speu, at the same period, MoSVY contributed for 25% (\$69,368) and ICRC for 75% (\$203,444) The IO fully covers for operating costs in both PRCs.

In 2017, ICRC will fund for 73% and MoSVY for 27% with a total budget of \$476,865 in Battambang PRC. Currently, ICRC pays operating costs, contributes to travel and food for 60%, PWDF is paying for the rest. And, operating costs are entirely covered by ICRC. In a medium term perspective, ICRC aims to increase PWDF budget from 10 to 15% per year, but in a short term perspective ICRC will stop argue in favor of a 100% contribution of PWDF in its PRCs and OCF.

Siem Reap PRC is fully managed by PWDF. In 2016, they covered the PRC for an amount of \$180,500 while WHO supported the PRC for \$22,129 for food, transportation, local materials. In 2017, WHO planned to contribute for \$16,557.

SCIC in Battambang, managed by PWDF, has an annual budget of around \$90,000.

4.3. Estimation of costs charged to patients of rehabilitation services in comparison to the level of catastrophic health expenditures

4.3.1. Estimation of the level of catastrophic health expenditures

We assessed the level of catastrophic health expenditures to compare to the cost charged to the patient. Health expenditures are considered to be catastrophic when a person spends more than 40% of its capacity-to-pay (or household non-subsistence income, i.e. income available after basic needs have been met) in out-of-pocket payments. The threshold of 40% may be adapted according to a country's specific situation, but it allows comparisons between countries, according to WHO methodology. Please refer to the introduction for more information on the catastrophic health expenditure methodology ([link](#)).

The capacity-to-pay is expressed as the total consumption expenses per capita per year minus the national poverty line. We used the national daily poverty line per capita as defined in 2009: Cambodia (3,871Riel), Phnom Penh (6,347Riel), other urban (4,352Riel), and rural (3,503Riel). In Cambodia, no distinction has been made related to a potential different level of consumption between different socioeconomic status of households surveyed. The percentage of the total population living below the poverty line fell to 21.1% in 2010, then 19.8% in 2011, and 18.9% in 2012.

The table 24 shows the calculation of the level of catastrophic health expenditures performed by the author. It is based on the Cambodian Socio-Economic Survey 2014 (National Institute of Statistics and Ministry of Planning 2015), and a country poverty analysis from 2014 (Asian Development Bank 2014).

Table 24 : Estimation of catastrophic health expenditures in Cambodia

Variables	Cambodia	Phnom Penh	Other urban	Rural
Annual food consumption per capita	1 956 000 KHR	2 940 000 KHR	2 268 000 KHR	1 764 000 KHR
Total consumption per month per capita	371 000 KHR	622 000 KHR	457 000 KHR	321 000 KHR
Total annual consumption per capita	4 452 000 KHR	7 464 000 KHR	5 484 000 KHR	3 852 000 KHR
Poverty line for 2015	1 393 560 KHR	2 284 920 KHR	1 566 720 KHR	1 261 080 KHR
Capacity to pay	3 058 440 KHR	5 179 080 KHR	3 917 280 KHR	2 590 920 KHR
Catastrophic health expenditure (>capacity to pay *40%)	1 223 376 KHR	2 071 632 KHR	1 566 912 KHR	1 036 368 KHR
Equivalent in US Dollars	\$ 302.17	\$ 511.69	\$ 387.03	\$ 255.98

Source: Author

These variations of the level of catastrophic health expenditures are due to the gap of income between urban and rural areas, people living in urban areas are wealthier than those living in rural areas. We estimated that health expenditures are catastrophic if they are equal or above: \$302.17 in Cambodia, \$511.69 in Phnom Penh, \$387.03 in other urban areas and \$255.98 in rural areas.

4.3.2. Estimation of the cost supported by patients of rehabilitation services

A detailed explanation of the methodology used to estimate the cost supported by patients of rehabilitation services is presented in the General introduction ([link](#)) of this thesis.

Physiotherapy services

The cost charged to the patients for physical therapy (PT) sessions varies from public health facility where some fees are applicable to PRCs where services are mainly free of charge. In public health facilities, fees for services are applied for a physical therapy session, and the price varies depending if the patient received surgery before and thus if he is an in-patient or out-patient. Here we took into account a \$5 session for physical therapy as a referral. We also consider travel and food allowances for people with disabilities based on PWDF ones. As mentioned before, in the public sector there is a \$7.41 allowance and a \$5 pension scheme,

and in PRCs, there is a food allowance of \$0.74 per day, a travel allowance of \$2.47 and a pension scheme of \$5. In our estimations, we took into account public allowances in the estimation of the cost of the nearest rehabilitation facility, and for PRCs we include the PRC allowance.

At public hospital, the price of a physiotherapy session varies from \$2.5 to \$5 with an average of \$5 per session. In PRCs, services are free, but in VIC, physiotherapy services are charged \$5 and an additional cost of 1\$ is charged for the initial session, which corresponds to the full contribution for a patient. For our estimations, we take into account a \$5 session that corresponds to the average price throughout public facilities.

The table 25 summarizes the average number of session per type of conditions for one adult, based on data collected during the study. On average 8 sessions are required for physiotherapy services, but this number depends on the condition treated.

Table 25 : Average number of sessions per condition for physiotherapy services

Conditions	Average number of sessions (rounded up)
Physiotherapy (average)	8
Clubfoot	7
Cerebral palsy	15
Low back pain	9
Fractures	6
Hemiplegia	10
Respiratory condition	7

Source: Author, based on data collection

We thus obtained the table 26, which gives an overview of all costs applied to physiotherapy (PT) services, categorized by type of conditions. For each type of condition we calculated the cost for the nearest physical therapy service (public facility), for the higher and nearest level of PT (PRC) and for the higher and nearest level of PT with free services (PRC). These costs are estimated for an inpatient and an outpatient and whether or not the patient received an allowance (as described above).

Table 26 : Estimation of costs charged to the patients of physiotherapy services, USD

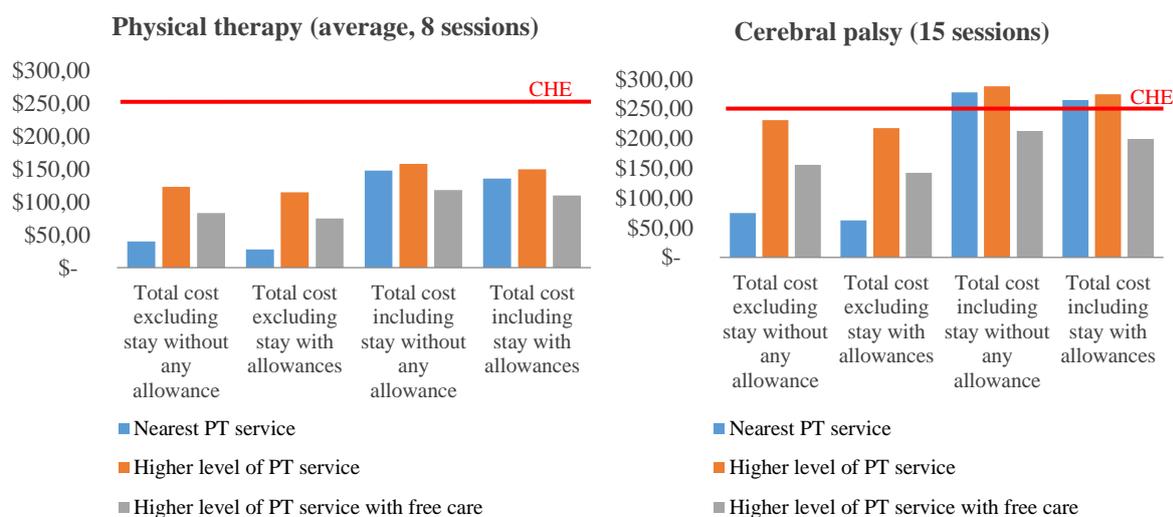
		Total excluding without allowance	cost stay any	Total excluding with allowances	cost stay any	Total including without allowance	cost stay any	Total including with allowances	cost stay any
Physiotherapy average (8)	Nearest PT service	\$ 40.00		\$ 27.59		\$ 148.00		\$ 135.59	
	Higher level of PT service	\$ 123.23		\$ 114.84		\$ 158.40		\$ 150.01	
	Higher level of PT service Free	\$ 83,23		\$ 74,84		\$ 118,40		\$ 110,01	
Clubfoot or respiratory condition (7)	Nearest PT service	\$ 35.00		\$ 22.59		\$ 129.50		\$ 117.09	
	Higher level of PT service	\$ 107.82		\$ 100.17		\$ 139.90		\$ 132.25	
	Higher level of PT service Free	\$ 72.82		\$ 65.17		\$ 104.90		\$ 97.25	
Cerebral palsy (15)	Nearest PT service	\$ 75.00		\$ 62.59		\$ 277.50		\$ 265.09	
	Higher level of PT service	\$ 231.05		\$ 217.48		\$ 287.90		\$ 274.33	
	Higher level of PT service Free	\$ 156,05		\$ 142.48		\$ 212.90		\$ 199.33	
Low back pain (9)	Nearest PT service	\$ 45.00		\$ 32.59		\$ 166.50		\$ 154.09	
	Higher level of PT service	\$ 138.63		\$ 129.50		\$ 176.90		\$ 167.77	
	Higher level of PT service Free	\$ 93.63		\$ 84.50		\$ 131.90		\$ 122.77	
Fractures (6)	Nearest PT service	\$ 30.00		\$ 17.59		\$ 111.00		\$ 98.59	
	Higher level of PT service	\$ 92.42		\$ 85.51		\$ 121.40		\$ 114.49	
	Higher level of PT service Free	\$ 62.42		\$ 55.51		\$ 91.40		\$ 84.49	
Hemiplegia (10)	Nearest PT service	\$ 50.00		\$ 37.59		\$ 185.00		\$ 172.59	
	Higher level of PT service	\$ 154.03		\$ 144.16		\$ 195.40		\$ 185.53	
	Higher level of PT service Free	\$ 104.03		\$ 94.16		\$ 145.40		\$ 135.53	

Costs above the level of catastrophic health expenditures in rural areas (\$255.98) are in red in the table.

Source: Author

The figure 22 focuses on physiotherapy services, with an average of 8 sessions and cerebral palsy treatment which requires 15 sessions. The red line represents the level of catastrophic health expenditures and we chose the reference for rural areas to focus on a large and vulnerable group of the population (\$255.98 in rural areas).

Figure 22 : Distribution of costs for PT services (left chart PT services, right chart Cerebral palsy), USD



CHE: catastrophic health expenditures

Source: Author

Based on these results, physical therapy services usually do not represent catastrophic health expenditures for patients in public health facilities or in PRCs. But some conditions, such as cerebral palsy, require a higher number of sessions and therefore the cost charged to the patients is higher, especially if the patient has to stay at hospital, if he’s “not enough poor”, a person with disabilities and, do not beneficiate to PWDF allowances. According to these estimations, the patient has thus a greater probability to be financially impoverished and fall below the poverty line when seeking PT services for cerebral palsy.

On average, physical therapy sessions are less expensive when patients are seeking care at the nearest facility, mainly because of transport costs. But, if physical therapy services are free of charge, as it is currently the case for PRCs, higher level of PT services (PRCs) are less expensive than nearest services (public facilities), regardless of the type of condition. The big difference between public facilities and PRCs (not free) is explained by the distance travelled by patients to come to PRCs, while going to nearest hospital costs them almost no travel cost.

Prosthetics and orthotics services

Option 1: cost of P&O services based on average cost charged by VIC PRCs

To assess the cost charged to the patients for P&O services, we took as a reference Kien Khleang PRC costs per devices as VIC is the only IO to introduce fees for rehabilitation

services in PRCs. Based on minimum and maximum contributions of each device, we estimated an average cost for upper limb prosthetics, lower limb prosthetics, orthotics, and wheelchairs, as shown in the table 27.

Table 27 : Kien Khleang costs of devices according to suggested contribution of patients, USD

	Min	Max	Average
Upper limb prosthetics	\$ 1.00	\$ 143.00	\$ 59.79
Lower limb prosthetics	\$ 6.00	\$ 276.00	\$ 164.40
Orthotics	\$ 1.00	\$ 210.00	\$ 62.78
Wheelchair	\$ 4.00	\$ 170.00	\$ 107.86

Source: Author, based on Kien Khleang data

In addition, based on our study, the provision of P&O to a patient required that the patient follows 3 P&O sessions for the provision of prosthesis, 4 sessions for the provision of orthosis and 2 sessions for a wheelchair. Prosthetists and Orthotists (POs) declared that they need around 3 days to manufacture a prosthesis (between measurement and fitting step), and 5 days for an orthosis. Therefore, the provision of prosthesis requires that the patient stays at least 5 days at the PRC: first consultation (measurement step), then 3 working days on the prosthesis, the day after, the patient can fit the new prosthesis and observe with PO changes to make (2nd session), and finally patient has its last session with the PO after the rectification of the prosthesis (3rd session).

Assistive device services require multi-disciplinary work and combined sessions with a physiotherapist and a P&O to assess needs, production and fitting of the device, and train to use. For example, a following the production and fitting of a prosthesis, the patient will have to follow a certain number of physiotherapy sessions (around 1 session per day for 2 weeks) in order to be familiar with the prosthesis. This is an additional cost that is not included in the calculation. Both for prosthesis and orthosis, some readjustments may be necessary and thus the patient will have to come for further sessions. So we estimated a minimum of 6 days stay at the PRC including when the patient will come back for a final rectification session. For wheelchairs devices, a patient needs minima 2 sessions, equivalent to 2 days at the hospital.

Not only patients coming for the first time will need to stay for gait training, but also to come back several times in their life for maintenance, adjustments or renewal. Children in particular will have to come back several times as they grow. All these costs has not been included in the calculation

We thus obtained the table 28 and the Figure 23 with a comparison between patients' cost for nearest hospital and nearest higher technical level hospital¹⁴; between the cost including and excluding the stay (it means the patient is doing a return travel each session time), and between costs including allowances and pension scheme and cost excluding allowances and pension scheme.

Table 28 : Estimation of costs charged to the patients of P&O services, USD

		Total cost excluding stay without any allowance	Total cost excluding stay with allowances	Total cost including stay without any allowance	Total cost including stay with allowances
Upper limb prosthesis: Above Elbow	Nearest PRC	\$86.96	\$75.79	\$132.72	\$121.55
	Nearest PRC Free	\$27.18	\$16.01	\$72.94	\$61.77
	Nearest higher technical level PRC	\$111.80	\$100.63	\$137.69	\$126.52
	Higher level of PT service Free	\$52.02	\$40.85	\$77.90	\$66.73
Lower limb prosthesis: AKPP/KD	Nearest PRC	\$191.58	\$180.41	\$237.34	\$226.17
	Nearest PRC Free	\$27.18	\$16.01	\$72.94	\$61.77
	Nearest higher technical level PRC	\$216.42	\$205.25	\$242.30	\$231.13
	Higher level of PT service Free	\$52.02	\$40.85	\$77.90 md	\$66.73
Orthotic: KAFO	Nearest PRC	\$95.39	\$83.48	\$149.22	\$137.31
	Nearest PRC Free	\$32.61	\$20.70	\$86.44	\$74.53
	Nearest higher technical level PRC	\$125.20	\$113.29	\$154.18	\$142.27
	Higher level of PT service Free	\$62.42	\$50.51	\$91.40	\$79.49
Wheelchair	Nearest PRC	\$118.73	\$109.78	\$140.29	\$131.34
	Nearest PRC Free	\$10.87	\$1.92	\$32.44	\$23.49
	Nearest higher technical level PRC	\$128.66	\$119.71	\$145.26	\$136.31
	Higher level of PT service Free	\$20.81	\$11.86	\$37.40	\$28.45

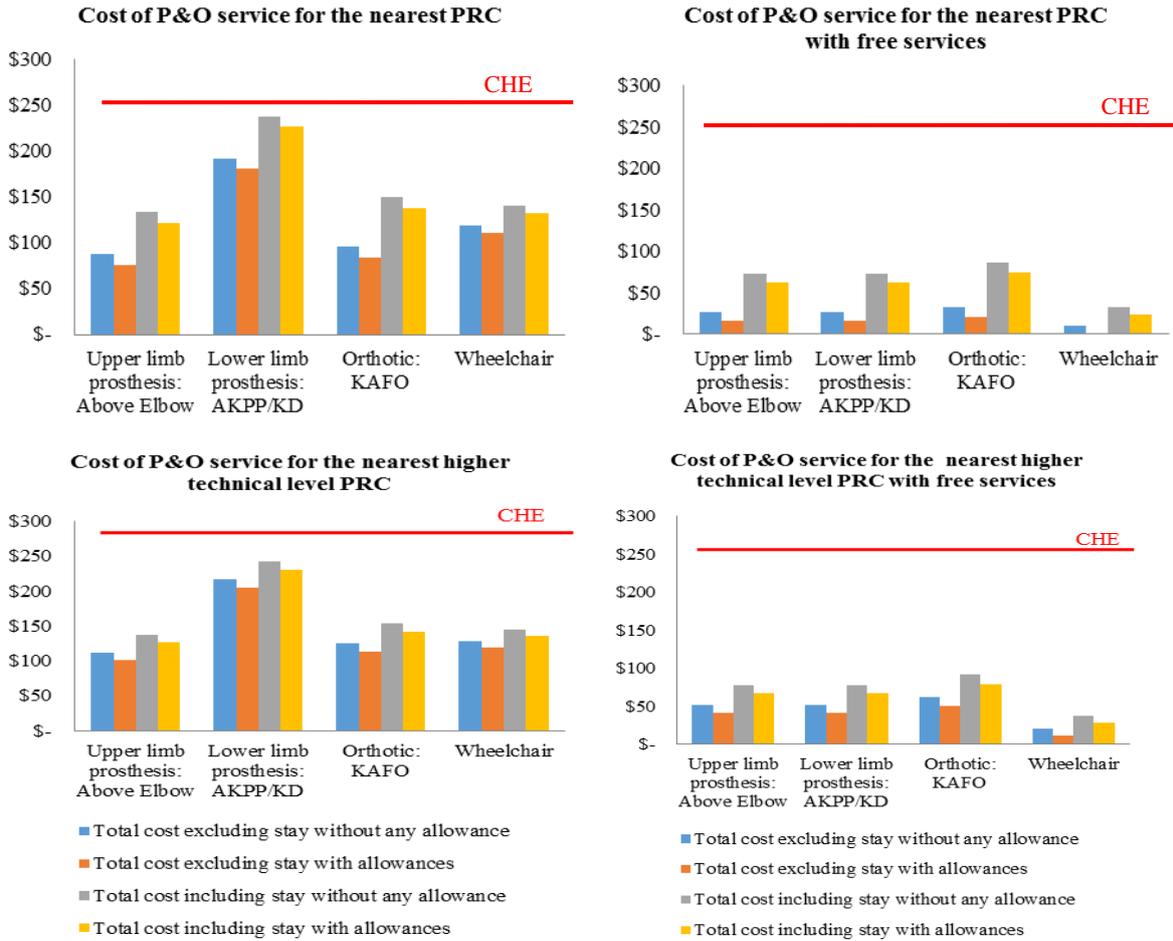
Source: Author

For instance, the cost of upper limb prosthesis in the nearest PRC for a patient varies from \$75.79 to \$132.72 (or \$16.01 to \$72.94 for free of charge PRC), and in a higher technical level PRC it varies from \$100.63 to \$137.69 (or from \$40.85 to \$77.90 for free of charge PRC). Usually, patients used to stay in the PRC (except in Phnom Penh PRC), thus the cost varies from \$121.55 to \$132.72 in the nearest PRC (or from \$61.77 to \$72.94 in free of charge PRC), and from \$137.69 to \$126.52 in a higher technical level PRC (or from \$77.90 to \$66.73 in free of charge PRC).

¹⁴ It is based on the scoring of the technical level of rehabilitation services.

As a reminder, we estimated that health expenditures are catastrophic (CHE) if they are equal or above: \$302.17 in Cambodia, \$511.69 in Phnom Penh, \$387.03 in other urban areas and \$255.98 in rural areas. In this case, it appears that none of P&O devices conducted to catastrophic health expenditure. However, the amount of a provision of lower limb prosthesis is very close to the level of CHE (red line).

Figure 23 : Variations of the cost charged to the patients for P&O services in Cambodia



Source: Author

Option 2: cost of P&O services based on the maximum cost charged by VIC PRCs

To compare these results, we re-calculated the cost charged to the patient based on a specific device per category for an adult who need a new prosthesis or orthotic. We took into account the full price, as it is shown in the table 29. It represents what a patient will pay if his contribution is 100% of the initial price.

Table 29 : Kien Khleang PRC's costs per devices, USD

Devices	Price
ULP : Above Elbow	\$ 143.00
LLP: AKPP/KD	\$ 265.00
Orthotics: KAFO	\$ 210.00
Wheelchair	\$147.00

Source: Kien Khleang PRC's data

We thus obtained the table 28 and as before, there are comparisons between patients' cost for nearest facility and nearest higher technical level facility; between the cost including and excluding the stay, and between costs including allowances and pension scheme and cost excluding allowances and pension scheme.

For instance, the cost of upper limb prosthesis (above elbow) in the nearest PRC for a patient varies from \$159.01 to \$215.94 (or \$16.01 to \$72.94 for free of charge PRC) and in a higher technical level PRC it varies from \$183.85 to \$220.90 (or from \$40.85 to \$77.90 for free of charge PRC). For patients who stay in PRC, the cost varies from \$204.77 to \$215.94 in the nearest PRC (or from \$61.77 to \$72.94 in free of charge PRC), and from \$209.73 to \$220.90 in a higher technical level PRC (or from \$66.73 to \$77.90 in free of charge PRC).

By contrast, table 30 and Figure 24 show that the cost of the lower limb prosthesis (AKPP/KD) is always above the level of catastrophic health expenditures (CHE) for rural areas (\$255.98) if fees applied, and in main cases above Cambodia's level of CHE. We do the same observation for the provision of orthosis in a PRC with a higher technical level. Deliveries of upper-limb prosthesis and wheelchair remain below the level of CHE.

Table 30 : Estimation of costs charged to the patient of P&O services, USD

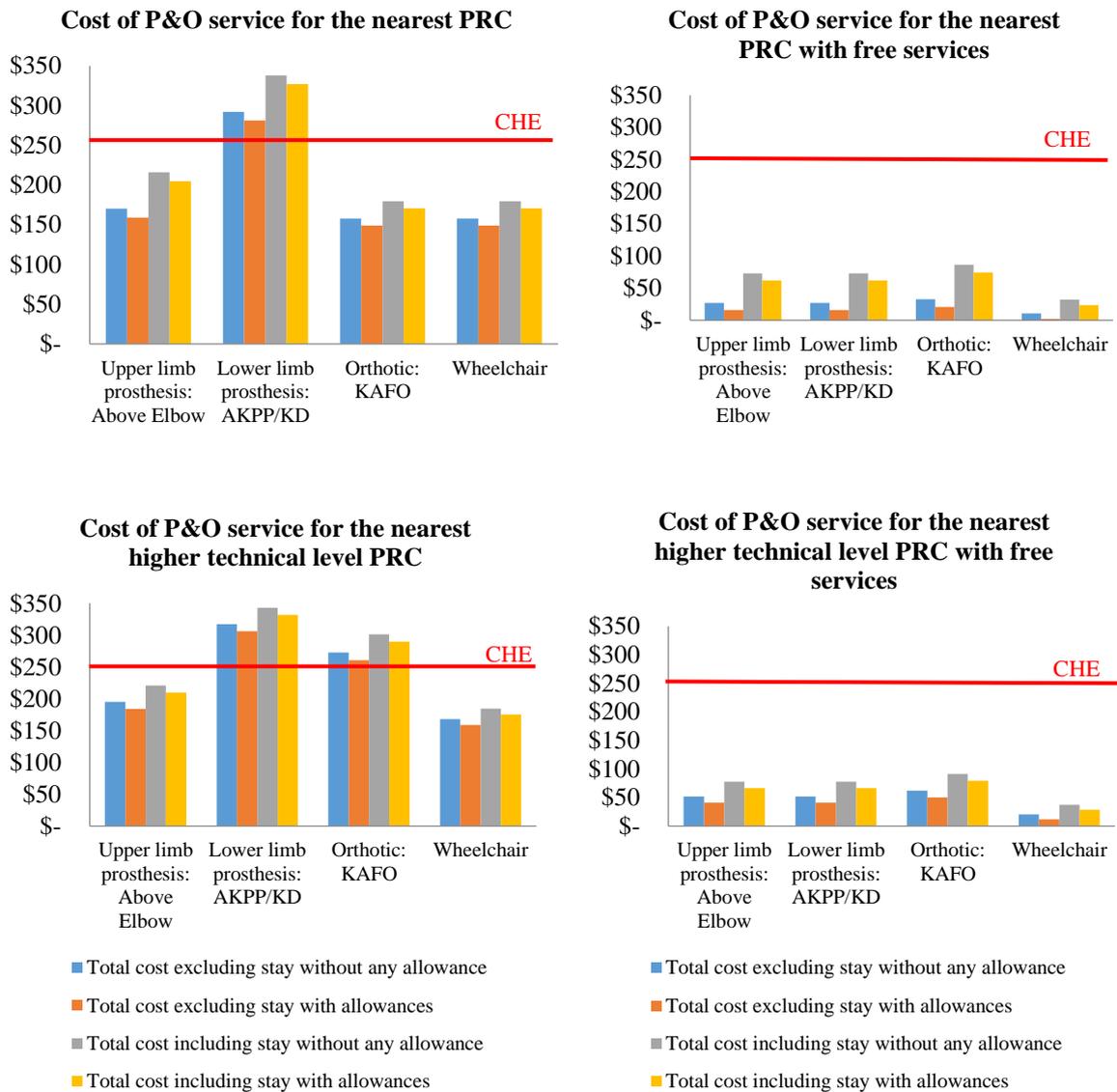
		Total cost excluding stay without any allowance	Total cost excluding stay with allowances	Total cost including stay without any allowance	Total cost including stay with allowances
Upper limb prosthesis: Above Elbow	Nearest PRC	\$170.18	\$159.01	\$215.94	\$204.77
	Nearest PRC Free	\$27.18	\$16.01	\$72.94	\$61.77
	Nearest higher technical level PRC	\$195.02	\$183.85	\$220.90	\$209.73
	Higher level of PT service Free	\$52.02	\$40.85	\$77.90	\$66.73
Lower limb prosthesis: AKPP/KD	Nearest PRC	\$292.18	\$281.01	\$337.94	\$326.77
	Nearest PRC Free	\$27.18	\$16.01	\$72.94	\$61.77
	Nearest higher technical level PRC	\$317.02	\$305.85	\$342.90	\$331.73
	Higher level of PT service Free	\$52.02	\$40.85	\$77.90	\$66.73
Orthotic: KAFO	Nearest PRC	\$157.87	\$148.92	\$179.44	\$170.49
	Nearest PRC Free	\$32.61	\$20.70	\$86.44	\$74.53
	Nearest higher technical level PRC	\$272.42	\$260.51	\$301.40	\$289.49
	Higher level of PT service Free	\$62.42	\$50.51	\$91.40	\$79.49
Wheelchair	Nearest PRC	\$157.87	\$148.92	\$179.44	\$170.49
	Nearest PRC Free	\$10.87	\$1.92	\$32.44	\$23.49
	Nearest higher technical level PRC	\$167.81	\$158.86	\$184.40	\$175.45
	Higher level of PT service Free	\$20.81	\$11.86	\$37.40	\$28.45

Costs above the level of catastrophic health expenditures in rural areas (\$255.98) are in red in the table.

Source: Author

The figure 24 presents the variations of the cost charged to the patient, according to the type of device, type of PRC, and condition of patient's stay and allowances. The level of catastrophic health expenditures for rural areas is also added.

Figure 24 : Variations of the cost charged to the patient for P&O services, USD



CHE: catastrophic health expenditures

Source: Author

Option 3: cost of P&O services and 10 physiotherapy sessions

As we mentioned before, usually persons who received a new P&O device will then have to complete a set of physical therapy sessions. Costs of devices will be higher than those we calculated. For P&O services we used the average cost charged by VIC PRC.

We based the estimation on the fact that a patient who received a new P&O device will required 10 sessions of physiotherapy, charged \$5 each (VIC PRC) or 0\$ (other PRCs), with or without the food allowance of PWDF (\$0.74 per day). The cost charged to the patient of

P&O devices is clearly a source of catastrophic health expenditures, especially for a lower limb prosthesis or an orthotic.

Tables 29 and 30 present costs according to the location and the technical level of the PRC (nearest PRC from patient's home, and nearest and higher technical level PRC from patient's home), and to the costing of PRC (free services, average VIC PRC cost, Full VIC PRC cost). We estimated the cost for upper limb prosthesis (above elbow), lower limb prosthesis (AKPP/KD) and orthotic (KAFO). The use of different variables enables a deep comparison of the full cost charged to the patient when seeking for treatment.

Table 31 : Estimation of costs charged to the patient of P&O services including PT sessions for the nearest PRC, USD

					Upper limb prosthesis: Above Elbow	Lower limb prosthesis: AKPP/KD	Orthotic: KAFO
Nearest PRC	PRC with free services	P&O	Total cost excluding stay without any allowance	\$ 27,18	\$ 27,18	\$ 32,61	
			Total cost excluding stay with allowances	\$ 16,01	\$ 16,01	\$ 20,70	
			Total cost including stay without any allowance	\$ 72,94	\$ 72,94	\$ 86,44	
			Total cost including stay with allowances	\$ 61,77	\$ 61,77	\$ 74,53	
		P&O and PT	Total cost excluding stay without any allowance	\$ 27,18	\$ 27,18	\$ 32,61	
			Total cost excluding stay with allowances	\$ 8,61	\$ 8,61	\$ 13,30	
			Total cost including stay without any allowance	\$ 207,94	\$ 207,94	\$ 221,44	
			Total cost including stay with allowances	\$ 189,37	\$ 189,37	\$ 202,13	
	PRC with VIC PRC's average costs	P&O	Total cost excluding stay without any allowance	\$ 86,96	\$ 191,58	\$ 95,39	
			Total cost excluding stay with allowances	\$ 75,79	\$ 180,41	\$ 83,48	
			Total cost including stay without any allowance	\$ 132,72	\$ 237,34	\$ 149,22	
			Total cost including stay with allowances	\$ 121,55	\$ 226,17	\$ 137,31	
		P&O and PT	Total cost excluding stay without any allowance	\$ 136,96	\$ 241,58	\$ 145,39	
			Total cost excluding stay with allowances	\$ 118,39	\$ 223,01	\$ 126,08	
			Total cost including stay without any allowance	\$ 317,72	\$ 422,34	\$ 334,22	
			Total cost including stay with allowances	\$ 299,15	\$ 403,77	\$ 314,91	

PRC with VIC PRC's full costs	P&O	Total cost excluding stay without any allowance	\$ 170,18	\$ 292,18	\$ 157,87
		Total cost excluding stay with allowances	\$ 159,01	\$ 281,01	\$ 148,92
		Total cost including stay without any allowance	\$ 215,94	\$ 337,94	\$ 179,44
		Total cost including stay with allowances	\$ 204,77	\$ 326,77	\$ 170,49
	P&O and PT	Total cost excluding stay without any allowance	\$ 220,18	\$ 342,18	\$ 207,87
		Total cost excluding stay with allowances	\$ 201,61	\$ 323,61	\$ 191,52
		Total cost including stay without any allowance	\$ 400,94	\$ 522,94	\$ 364,44
		Total cost including stay with allowances	\$ 382,37	\$ 504,37	\$ 348,09

Costs above the level of catastrophic health expenditures in rural areas (\$255.98) are in red in the table.

Source: Author

Table 32 : Estimation of costs charged to the patient of P&O services including PT sessions for the nearest and higher technical level PRC, USD

			Upper limb prosthesis: Above Elbow	Lower limb prosthesis: AKPP/KD	Orthotic: KAFO	
Nearest and higher technical level PRC	PRC with free services	P&O	Total cost excluding stay without any allowance	\$ 27,18	\$ 27,18	\$ 32,61
			Total cost excluding stay with allowances	\$ 16,01	\$ 16,01	\$ 20,70
		P&O and PT	Total cost including stay without any allowance	\$ 72,94	\$ 72,94	\$ 86,44
			Total cost including stay with allowances	\$ 61,77	\$ 61,77	\$ 74,53
	PRC with VIC PRC's average costs	P&O	Total cost excluding stay without any allowance	\$ 27,18	\$ 27,18	\$ 32,61
			Total cost excluding stay with allowances	\$ 8,61	\$ 8,61	\$ 13,30
		P&O and PT	Total cost including stay without any allowance	\$ 207,94	\$ 207,94	\$ 221,44
			Total cost including stay with allowances	\$ 189,37	\$ 189,37	\$ 202,13
	PRC with VIC PRC's average costs	P&O	Total cost excluding stay without any allowance	\$ 111,80	\$ 216,42	\$ 125,20
			Total cost excluding stay with allowances	\$ 100,63	\$ 205,25	\$ 113,29
			Total cost including stay without any allowance	\$ 137,69	\$ 242,30	\$ 154,18
			Total cost including stay with allowances	\$ 126,52	\$ 231,13	\$ 142,27
		P&O and PT	Total cost excluding stay without any allowance	\$ 161,80	\$ 266,42	\$ 175,20
			Total cost excluding stay with allowances	\$ 143,23	\$ 247,85	\$ 155,89
			Total cost including stay without any allowance	\$ 322,69	\$ 427,30	\$ 339,18
			Total cost including stay with allowances	\$ 304,12	\$ 408,73	\$ 319,87

PRC with VIC PRC's full costs	P&O	Total cost excluding stay without any allowance	\$ 195,02	\$ 317,02	\$ 272,42
		Total cost excluding stay with allowances	\$ 183,85	\$ 305,85	\$ 260,51
		Total cost including stay without any allowance	\$ 220,90	\$ 342,90	\$ 301,40
		Total cost including stay with allowances	\$ 209,73	\$ 331,73	\$ 289,49
	P&O and PT	Total cost excluding stay without any allowance	\$ 245,02	\$ 367,02	\$ 322,42
		Total cost excluding stay with allowances	\$ 226,45	\$ 348,45	\$ 303,11
		Total cost including stay without any allowance	\$ 405,90	\$ 527,90	\$ 486,40
		Total cost including stay with allowances	\$ 387,33	\$ 509,33	\$ 467,09

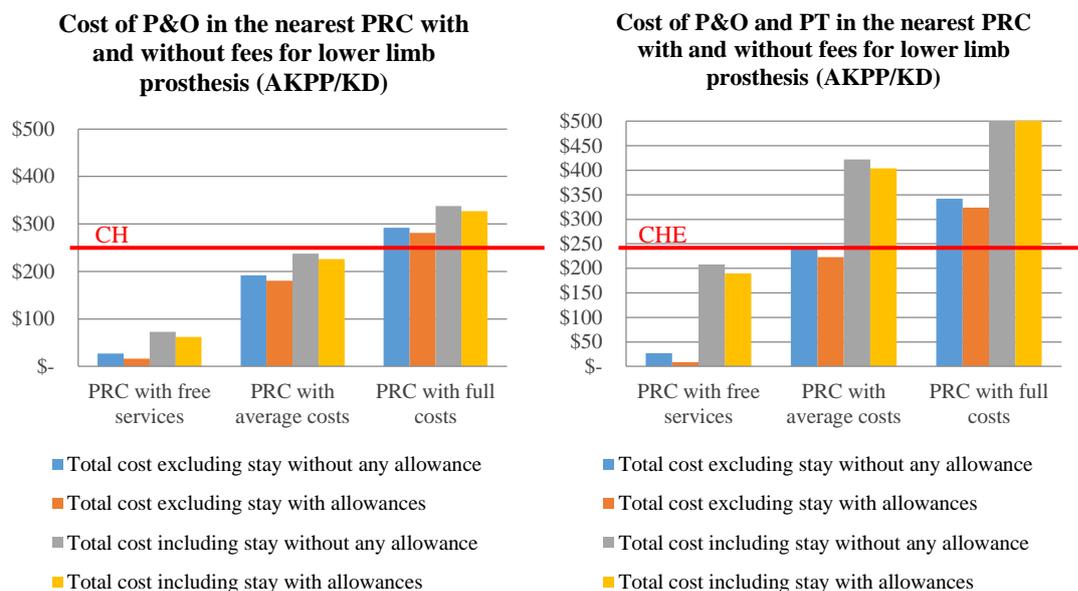
Costs above the level of catastrophic health expenditures in rural areas (\$255.98) are in red in the table.

Source: Author

Currently most of PRCs provide free services to their patients, and according to our estimations, for any prosthesis or orthosis provided the patient does not risk catastrophic health expenditures, even if he follows 10 physical therapy sessions. But when PRCs request fees (full or average price, according to patient's score) there is a risk of poverty for patients when they are seeking for treatment, particularly for lower limb prosthesis and when we include the physical therapy sessions.

For instance, and as seen in the Figure 25, the provision of a lower limb prosthesis and physical therapy sessions does not conduct to catastrophic health expenditures (CHE) in most of PRCs where services are free of charge for all. However, if a patient wants to go to a higher technical level PRC that is not close to its place of residence, cost of transport can be very high and close to the level of CHE. If the PRCs charges its services for the patient, cost of treatment almost always occur in catastrophic health expenditures, regardless to the average cost or the full cost.

Figure 25 : Variations of the cost charged to the patient for P&O with or without PT services in the nearest PRC, USD



CHE: catastrophic health expenditures
Source: Author

Otherwise, as some costs have not been taken into account in the estimation of the cost charged to the patient (up-stream costs, down-stream costs, and companion(s)'s costs), there is a high probability that the provision of some devices, especially the most expensive (lower limb prosthesis and orthotics) could conduct to catastrophic health expenditures and notably for people living in rural areas, regardless that the PRC charge fees for services or not.

Speech therapy services

Only data we have come from a private clinic in Phnom Penh, Happy Kids Clinic.

To calculate standard fees for a patient, we take into account: the initial consult (\$60), the second appointment with the assessment of the child (\$140), and then therapy sessions (approximately 6 weeks appointment with 1 session 30-40 min per week in average = $6 \times \$60 = \360). However, taking only into account costs related to the treatment, it represents in average \$560, which means catastrophic health expenditures for Cambodian. It also represents catastrophic health expenditures for rural ($> \$255.98$) and urban areas ($> \387.03),

except Phnom Penh where this cost is slightly below catastrophic health expenditures level (# \$511.69).

There is usually no cost of stay in Happy Kids Clinic as patients live in Phnom Penh, and the travel cost is not significant for the analysis. This cost is probably under-estimated as some patients will need more speech therapy sessions and maybe longer session (60 min session = \$80, while 30-40 min session = \$60) which represents more \$120 for a longer session. If it is the case, all costs linked to the treatment are catastrophic health expenditures for all Cambodian. But, the severity of the child's condition will determine how many sessions are required.

Summary

The following table 33 summarizes the risk of catastrophic health expenditures for patients of rehabilitation services, according to the type of service used and the type of facility.

We observe that for physiotherapy services, it is usually not a risk of impoverishment for patients, except in the case of long treatment such as cerebral palsy. Prosthetics and orthotics are provided at physical rehabilitation centers (PRCs) and thus, no fees are currently applied, it is not catastrophic health expenditure. However, if PRCs are handover to the government, fees will be applied and there will be a need for rehabilitation coverage in social protection mechanisms in order to avoid systematic catastrophic health expenditures for patients. Nevertheless, the most representative situation for patients is the one that take into account the combination of care: physiotherapy and prosthetics and orthotics services that is very expensive for the patient and a high risk of impoverishment.

Table 33 : Summary of the risk of catastrophic health expenditures for a patient according to each type of facility

Risk of catastrophic health expenditures for the patient (Yes/No)					
Rehabilitation services	Public service	PRC (free-of-charge)	PRC (fees, average cost)	PRC (fees, full cost)	Private services
Physical therapy services					
Physiotherapy (average)	No	No		No	No information
Clubfoot	No	No		No	
Cerebral palsy	Yes	No		Yes	
Low back pain	No	No		No	
Fractures	No	No		No	
Hemiplegia	No	No		No	
Respiratory condition	No	No		No	
P&O services					
Upper limb prosthetics	No P&O service in the public sector	No	No	No	No information
Lower limb prosthetics		No	No	Yes	
Orthotics		No	No	Yes	
Wheelchair		No	No	No	
P&O and PR services					
Upper limb prosthetics	No P&O service in the public sector	No	Yes	Yes	No information
Lower limb prosthetics		No	Yes	Yes	
Orthotics		No	Yes	Yes	
Speech therapy services					
Average	No Speech therapy service in the public sector	No speech therapy service in PRC	No speech therapy service in PRC	No speech therapy service in PRC	Yes

Source: Author

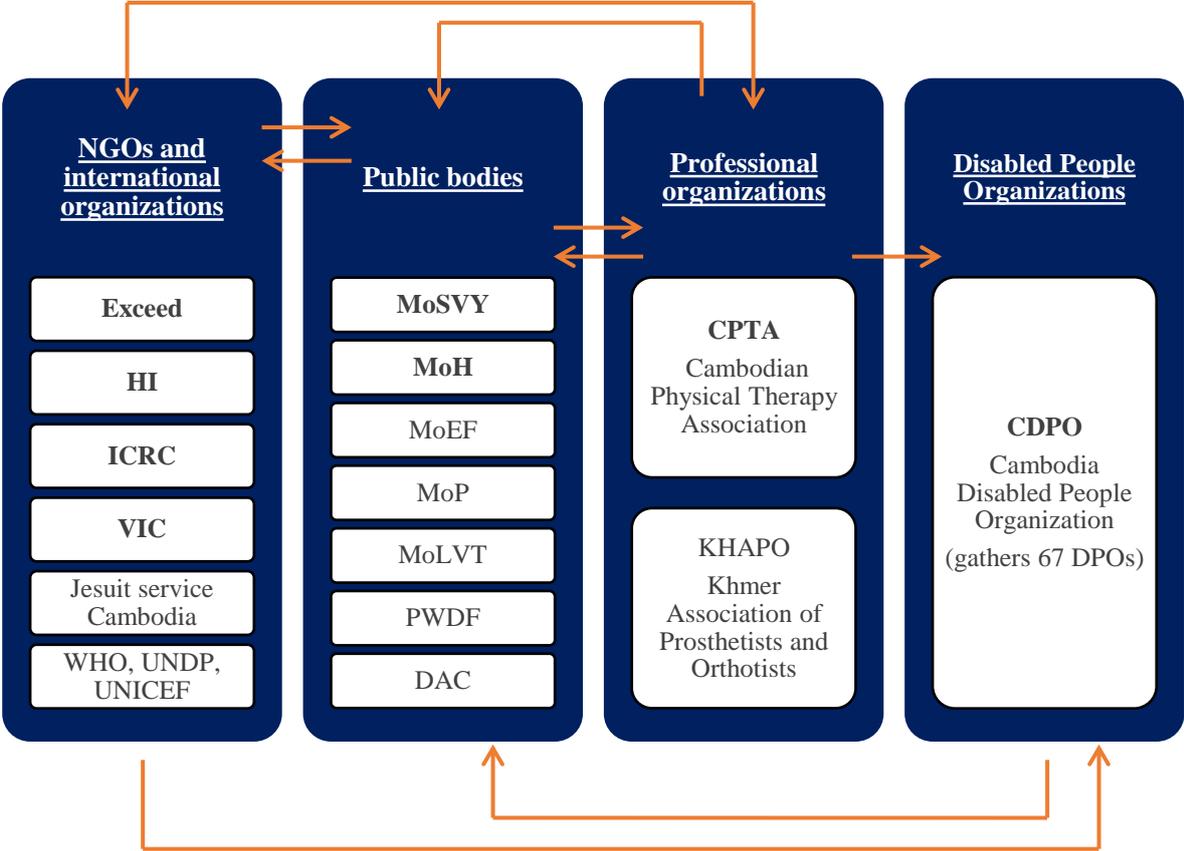
4.3.3. Impact of governance on the government financing gap

Cambodia established a brutal dictatorship in the 70's at the Khmers rouges period, this dictatorship led to serious human rights abuses. According to Acemoglu and Robinson (Acemoglu and Robinson 2012), communist regimes generally set up various types of institutions that lead to poverty instead of prosperity, which used to be the initial goal. In Cambodia, The effects of this type of brutal dictatorship have been devastating in Cambodia, where the economic institution has led to economic collapse and famine. The economic institution as created by communism is supported by extractive political institutions concentrating all power in the hands of the communist parties without any restriction on the exercise of this power.

The governance of the rehabilitation sector in Cambodia is complex, even if the main responsibility of disability-linked issues lies to Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY). As Veroeff reported (Verhoeff 2014), it includes two inter-

Ministerial, multi-stakeholder coordination bodies, numerous overlapping committees, sub-committees and working groups. Main actors involved in the rehabilitation sector are of four types: NGOs and international organizations (IOs), public bodies, professional organizations, and disabled people organizations (DPOs), as presented in the figure 26.

Figure 26: Interaction between main actors of the rehabilitation sector in Cambodia



Bold names are the most influential or involved actors in the sector

Source: Author

For the group “NGOs and international organizations”: they interact with Ministries, particularly the MoSVY and the MoH in aim to provide technical and financial support to the rehabilitation sector. They work closely with professional organizations in order to increase quality and coverage of rehabilitation services. Their collaboration with DPOs mainly consists in raising awareness for the rights of people with disabilities.

Public bodies regulate the sector and are supposed to take on a coordination role between all actors. Actually, they are slowly taking over some of the responsibilities in the management of rehabilitation services (MoSVY) and in sector planning (MoH).

Professional organizations work towards the promotion of rehabilitation professionals within the health and rehabilitation sector in terms of regulation of the practice and their recognition. They support DPOs for advocacy, and they contribute to high level discussions with other actors. In addition, they work closely with international organizations on specific rehabilitation issues.

Disabled people organizations mainly work with international organizations in aim to advocate to the government for the rights of people with disabilities for inclusive services, and they support people with disabilities in the recognition of their rights.

Thanks to the combined efforts of all actors, some progress has been made towards the development of a system of services at the national level. Some examples are the current work on national professional standards for physiotherapists, the strategy for MOSVY to take over rehabilitation centers, the efforts to improve social protection mechanisms.

The Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY) is the most involved Ministry and has the greater responsibility for disability issues. MoSVY has signed a MoU with international organizations in 2008. Four main institutions for disability are under the responsibility of the MoSVY: the Department of Welfare for persons with disabilities, the Persons with Disabilities Foundation (PWDF), the Disability Action Council Secretariat (DAC) and the Disability Rights Administration (DRA). There is an overlap of functions resulting in challenging monitoring of services and unclear criteria for planning and evaluation of services. There are representatives of MoSVY at several sub-national levels: Provincial and Municipal Departments of Social Affairs, Veterans and Youth Rehabilitation (PoSVY) and District Offices.

PWDF is an independent body and expected to ensure fund raising and be responsible for the managerial and operational activities of PRCs. However fund raising remains a limited activity of PWDF since its creation, and to date the operational activities of PRCs are mainly supported by IOs. We may wonder about the relevance of this organism, and its role within the health system.

The technical supervision of PWDF is under the MoSVY and its financial supervision is under the Ministry of Economy and Finance (MoEF). However it is unclear how these two ministries coordinate together. PWDF is represented in 24 provinces by a Deputy Director of

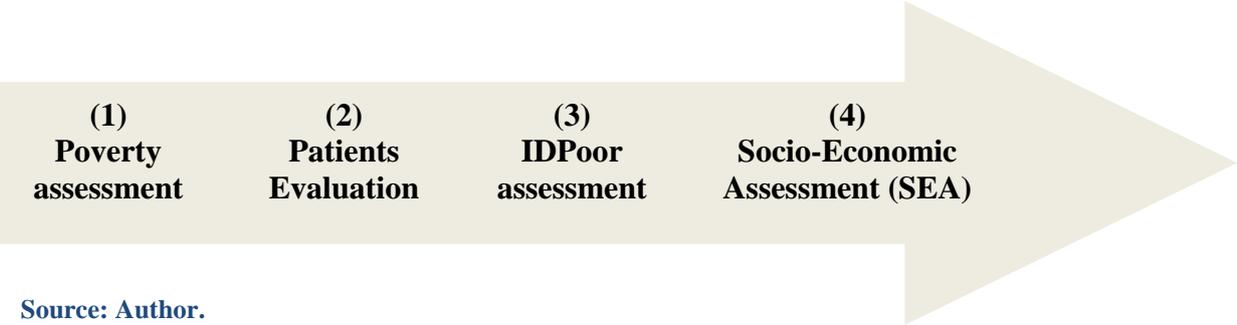
the POSVY who is designated as PWDF Director. DPOs, international organizations or other external bodies are not included in the Governing Board of PWDF.

5. Promote equity and equal access to rehabilitation services: estimate the capacity to pay of patients in PRCs

Physical rehabilitation centers (PRCs) in Cambodia are using their own tool or the IDPoor questionnaire, developed by the government, to assess whether or not a patient is able to pay for rehabilitation care, or just to assess if the patient should receive a per diem.

We worked with a PRC managed by HI, located in Kampong Cham, to provide support in the development of a comprehensive tool that will reveal the current capacity to pay of patients for rehabilitation care, a socio-economic assessment (SEA) of patients. Several tools have been developed and used before the SEA, as described in the Figure 27.

Figure 27: Tools developed in Kampong Cham PRC (1, 3 and 4) and in Cambodia (2) to address the issue of healthcare fees.



Source: Author.

Kampong Cham PRC initially developed a “**poverty assessment**” tool of patients. This survey is a basic decision-making tool to decide whether or not a patient should receive a per diem for transportation. It is made to target only the poor and it does not assess the capacity to pay of all patients. The tool is composed of 13 questions, scored from 0 to 3. It evaluates the assets of the patient’s household: rice land, food, animals, vegetables or fruit lands, housing, toilet or latrine, water, clothing, transportation, labor, dependent (health care needs), lightning, and media equipment. A total score out of 39 (13*3) is calculated from each answer’s score. The interpretation of the score is the following:

- Score [0-12] = 100% support for transportation (3,000 Riels or \$0.74)

- Score [13-15] = 70% support for transportation (2,100 Riels or \$0.52)
- Score [16-18] = 50% support for transportation (1,500 Riels or \$0.37)
- Score [19-39] and for patients living under 2km from PRC= no support

This tool was systematically conducted for new patients of the PRC, and it was assessed 3 times per patient: when a patient comes for the first time, then 6 months later, and finally one year after the first registration. There is no more assessment after this third assessment and, thus it is probably an issue for some long term patients who have seen their situation changed after over one year. According to the Kampong Cham PRC’s and HI’s staff involved in the process, the tool was too long to fill-in, not accurate, the period of assessment is not logical, and most of patients received 100% support for transportation. Therefore, there was a need to develop another tool, more comprehensive and inclusive.

Based on these observations, HI Cambodia’s team in partnership with administrative staff of the PRC decided to develop a new tool, the “**Patients Evaluation**”. This tool is based on the poverty assessment of Health Equity Funds, and the poverty assessment developed by the non-governmental organization VIC. The aim of this tool was to identify how much will be the financial contribution of a patient in the PRC, where rehabilitation are free.

The Patients Evaluation is composed of 17 questions categorized in 12 themes, according to the IDPoor. The score varies from 0 to 4 for each question, except for the one related to debts (from 0 to 3) and the family conditions’ question (from 0 to 2). The total score calculated is out of 65. The scale of results is the following:

Table 34: Scoring for the Patients Evaluation tool

Score	Category	Suggested patient’s contribution
0-10	A	(Very Rich) Suggested Voluntary Contribution 76-100%
11-17	B	(Rich) Suggested Voluntary Contribution 51-75%
18-33	C	(Middle Class) Suggested Voluntary Contribution 30-50%
34-49	D	(Poor) Requested for voluntary contribution 15-30%
50-65	E	(Very Poor) Free services

Source: Author, adapted from HI Cambodia

In addition, there is a part reserved to the discretion of the interviewer related to its value judgement of the patient, in order to identify possible false testimonies. This part allows the interviewer to estimate its perceived honesty of the patient (honest, not honest), as well as his appearance (popular or modern clothes, using modern phones and wearing jewelries, modern motorbike, car), and its evidence-based documents (IDPoor card, support poverty letter, letter of debt/loan), in order to affirm or deny the results of the scoring. A final part is dedicated to health worker's comments.

Limits of this tool are related to the construction of the score. It attributes the same weight to each indicator, which is not relevant and no evaluation of the robustness of the scoring has been done. For some questions, patients can face some difficulties to answer (e.g. last year household' spending in general, or cumulated duration of illness for the all household). Additionally, the last part, very subjective, was the subject of strong criticism or debates in the PRC.

The introduction of progressive patient fees for rehabilitation care according to patients' capacity in PRCs is relevant if patients are coming from various socio-economic classes. But, according to data collected from the Patients Evaluation, most of patients are very poor.

The Socio-Economic Assessment (SEA) (see Annexes) has been developed to improve the previous tool, based on limits mentioned above. The tool is composed of 15 closed questions scored according to the IDPoor questionnaire methodology. The first question is not scored: *“Is your house the property of your household? Or does your household rent it from other people?”* with the following items, *“No house”*, *“Not own house but don't pay a rent”*, *“Rent house”*, *“Own house or live with parents”*. Following questions are related to:

- Construction material of the house's roof of the patient
- Construction material of the house's exterior walls
- Construction material of the house's floor
- Dwelling area of the house
- General condition of the house
- Equipment available in the house
- Means of transport of the household
- Main income source of the household
- Land area of the household for growing rice, other crops or orchards
- Types of fishing equipment owned by the household

- Main source of revenue of the household
- Type of land where the household lives
- Livestock ownership
- Volume of livestock owned
- Potential financial issues faced over the past 12 months
- Number of people in the household who cannot produce an income

The total score obtained is thus out of 72, and transformed in a percentage. To be consistent, we respect the weight defined for each indicator in the IDPoor questionnaire. At least three parts composed this tool: the board, assessment n°1, and assessment n°2. The board contains all patients' information and potential changes between different assessments.

We propose a detailed classification which is commonly more accepted than the one developed in the "Patients Evaluation" as it is favor equity between patients and it minimizes the risk of a wrong classification. A feasibility analysis has been conducted on a small sample of patients in the center in order to decide the right scale of contributions.

Table 35: Scoring for the SE assessment

Score	Category	Suggested patient's contribution
0-11%	A	100% contribution
12-23%	B	75% contribution
24-36%	C	50% contribution
37-49%	D	25% contribution
50-100%	E	Services are free-of charge

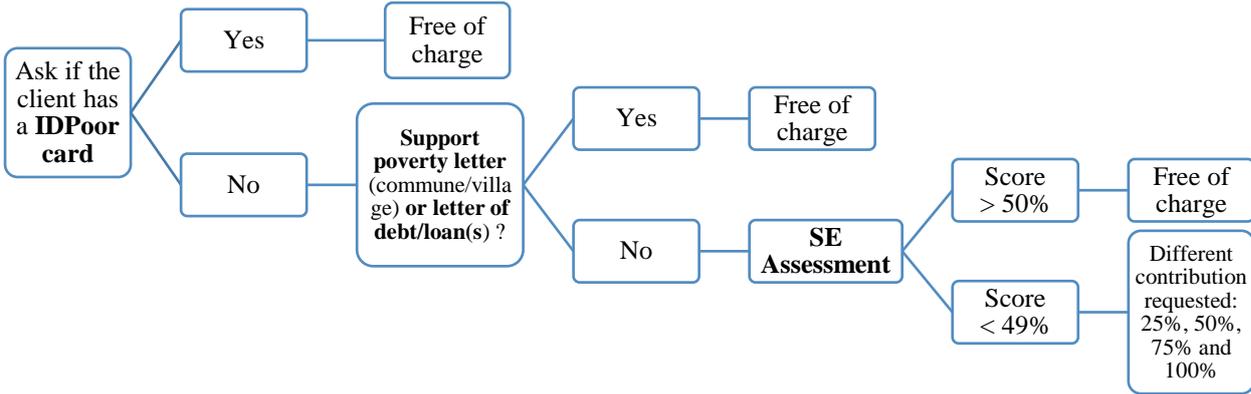
Reading note: for example, if the SE score is 8 out of 100, this means that the person belongs to the category A, and has to pay for the total health cost (100% contribution).

Source: Author

We recommend assessing patients at least three times: on their first venue, then in Year +1, and Year +3. After, the patient is free to ask for a new assessment if its situation has changed. Ideally, every year, a sample of PRC's patients, selected randomly, will be assessed in a face-to-face interview at their own house, in order to control possible false testimonies and avoid error of inclusion in a wrong category.

A suggested process to implement the questionnaire is explained in the Figure 28. The SEA is administrated to the patient if the patient has no official evidence of his financial situation (IDPoor document). Otherwise, if the patient has the iDPoor card he is systematically exempted from any fees.

Figure 28: Proposed process to implement the SE assessment to Kampong Cham patients



Source: Author

The contribution of patients should be discussed deeper, as no evidence based is available to define the right amount of patient’s participation for rehabilitation care in the literature or at national level. Based on available data, we suggest implementing a voluntary contribution as there is no legal proof that a mandatory contribution is permitted for PRCs in Cambodia and no discussion is ongoing on this subject.

A differentiation should be done between patients who come for P&O services and patients who come for physiotherapy services, as it is described in the table 36 below. Indeed, a patient who needs only physiotherapy service should be refers to the nearest public hospital instead of receiving for free physiotherapy service that does not contribute to the financial sustainability of the center. This is justified by the current and obvious behavior of some patients who prefer to come to PRCs with free-of-charge services, instead of public hospitals where there are fees for physiotherapy.

A first step for the introduction of user fees is the payment of the maintenance of their P&O devices only (the production cost is around \$20 in Kampong Cham), except for poor and very poor patients who pay nothing. These fees promote a more responsible behavior of patients

and prepare them progressively to the introduction of user's fees for all rehabilitation services, as it is culturally the case for basic health care in the public sector.

We assume to keep free of charge services for poor and very poor patients (according to IDPoor or SE assessment classification) in short, medium and long term perspectives. Health care services of poor and very poor is include in the budget of PRC in a short term period, but it will be acceptable that in medium term the government pays at least for poor and very poor patients (health insurance, health equity funds, etc.). Providing an implementation schedule of the introduction of user's fees in the PRC of Kampong Cham is required in order to avoid some behavior bias such as patient's reluctance to any fees that may conduct to an important decrease of the number of patients and thus reduce the access to rehabilitation care for the most vulnerable persons.

Ideally, this scheme should be replicable to all the 11 PRCs in order to give a standardize offer of specialized rehabilitation services for patients.

To estimate if the SE assessment is a reliable tool for the evaluation of the capacity to pay of patients, a pilot test has to be conducted in the PRC. Because of financial constraint, a probabilistic sampling will not be used, we will rather prefer to use a non-probabilistic sampling based on defined criteria. The probability to select each population member to compose the sample is thus unknown. We recommended using the purposive sampling methodology as its main goal is to focus on particular characteristics of a population that are of interest. We thus can access to people with disabilities who managed themselves to come to the rehabilitation center.

Table 36: Proposal schedule of user fees' introduction in Kampong Cham PRC

		Only Physiotherapy	Prosthetics & Orthotics device(s) + Physiotherapy	Maintenance of P&O device(s)
Current situation	All patients	Free of charge	Free of charge	Free of charge
	All patients	Referral to Public Hospitals with a PT service		
Short term	Poor & Very poor	Free of charge	Free devices for all	Free of charge
	Not poor	Variable contribution*		Variable contribution*
Medium term	Poor & very poor	Free of charge	Free of charge	Free of charge
	Not poor	Variable contribution*	Variable contribution* for PT sessions and free of charge for P&O devices	Variable contribution*
Long term	Poor & very poor	Free of charge	Free of charge	Free of charge
	Not poor	Fixed contribution	Fixed contribution	Fixed contribution

* According to his score, a patient's contribution ranges from 25% to 100%.

Source: Author

6. Conclusion

The present chapter investigated the rehabilitation sector in Cambodia in terms of economic and financial flows. Through this objective, we studied the Cambodian physical and functional rehabilitation sector and we looked at several elements, namely: a) the provision of rehabilitation services within the health system; b) the financial burden of rehabilitation services for patients; and c) the required expenses in the rehabilitation sector to cover unmet needs.

Cambodia's context

Cambodia, a lower-middle income economy, has a very significant amount of people with disabilities and one of the highest amputee rates in the world. The prevalence of disability is about 4% of the total non-institutional population, and about 24% of persons aged 60 years and above have a disability with a majority of women. 22% of the population lives in urban

areas, and the population remains quite young (43% of the population) but projections forecast that Cambodia will have an ageing population by 2050. While rehabilitation needs exist and are growing, the rehabilitation service sector in Cambodia remains limited and faces many challenges, especially the financial capacity to ensure that rehabilitation is available and affordable for those who require it.

Cambodian's poverty rate has decreased by half between 2004 and 2012, from 53% to 17.70%. Transparency and accountability in the country remain limited within the health system. There is no accreditation of health care providers, and the government starts to think to its enforcement. In the private sector, a lack of regulation conducts to a lack of accountability of health workers' practice in this sector. There is also large disparity in health and access to health services between the rich and the poor and between rural and urban areas.

In Cambodia, growing rehabilitation needs are due to a range of health conditions, but non-communicable diseases are the top ranking causes of disability in Cambodia in 2015.

Overview of health and rehabilitation system

The governance of the rehabilitation sector in Cambodia is complex, even if the main responsibility of disability-linked issues lies to Ministry of Social Affairs, Veterans and Youth Rehabilitation (MoSVY). It includes two inter-Ministerial, multi-stakeholder coordination bodies, numerous overlapping committees, sub-committees and working groups. Main actors involved in the rehabilitation sector are of 4 types: NGOs and international organizations (IOs), public bodies, professional organizations, and disabled people organizations.

Regarding the of rehabilitation services, they are mainly available outside the health system. 5 international organizations operating in the management of physical rehabilitation centers (PRCs) since their set up starting from the 80's, and they provide comprehensive services, including assistive devices, for a wide range of impairments. To date, only 2 of the 11 PRCs are under the management of the MoSVY through PWDF. Currently, the MoH provides physical therapy services in a limited number of provincial and national level hospitals, while the MoSVY and international and non-governmental organizations provide functional rehabilitation services (physiotherapy, prosthetics and orthotics (P&O), and other assistive devices) through the 11 PRCs.

There are opportunities to expand the offer of physical rehabilitation services and tackle issues related to financial access within the health system thanks to the Complementary Package of Activities (CPA) policy and the current Health Strategy. The private sector is the most popular source of treatment before the public sector for first, second and third treatment. 67.1% of people go to the private sector for first treatment, while 21.9% go to the public sector.

Since 2005, the Ministry of Health has implemented several health financing schemes. This includes health equity funds, vouchers and performance-based financing to improve access to basic health services for the population, especially the worse-off. In addition, the government works to implement a social health protection scheme for Cambodian people, even if this system is at an early stage of development. There is a variety of social protection schemes in Cambodia: National Social Security Fund (NSSF), the National social security fund for civil servants (NSSF-CS) both, the Social Health Insurance (SHI) both managed by the government, voluntary health insurance (community based health insurance (CBHI) and private companies), Health Equity Funds (HEFs), Government subsidy schemes (SUBO), Vouchers schemes and, other experiences (innovative fundraising and parallel health systems). And, as a complement, to determinate if a household is poor and thus eligible for some schemes, the Ministry of Planning has developed an identification tool for the poor that provides an “id poor card”, the Cambodian Identification of Poor Households Program (IDPoor). The social protection system is very fragmented, each scheme target a specific part of the population, and management of these mechanisms are operated by various ministries and non-governmental organizations. We noted a limited coverage of the population mainly due to a poor targeting of the population. For instance, mandatory health insurances are only for workers in the formal sector and public employees. Physiotherapy in public health service is most of the case include in the benefits of social protection schemes. However, the financial coverage of prosthetics and orthotics services are only include in NSSF/NSFF-C schemes and thus it concerns only a small part of the population, public and private workers in the formal sector. Nevertheless, even if physiotherapy included in some protection mechanisms, we saw before that in the health sector the quality of services provided is not satisfying.

Cost charged to rehabilitation's patients and their risk of impoverishment

Out-of-pocket payments remain high in Cambodia and higher than East Asia and Pacific countries and low- and middle-income countries' average. There is no figure available for the share of rehabilitation within the health sector, but some key actors meet during field assignment, estimated that it is between \$3.5 and 4.5 million in Cambodia.

We estimated that health expenditures are catastrophic if they are equal or above: \$302.17 in Cambodia, \$511.69 in Phnom Penh, \$387.03 in other urban areas and \$255.98 in rural areas. We compared these levels of catastrophic health expenditures to the costs charged to the patient. However, currently, rehabilitation services in PRCs are provided free-of-charge for patients, except in 3 PRCs that propose voluntary contributions to patients according to a poverty assessment. In order to be consistent with current willingness of non-governmental organizations to add user fees for rehabilitation services in PRCs, we assumed in this study that PRCs do not provide free-of-charge care to patients.

Physical therapy services usually do not represent catastrophic health expenditures for patients in public health facilities or in PRCs. But some conditions, such as cerebral palsy, require a high annual number of sessions and therefore the cost charged to the patient is higher. On average, physical therapy sessions are less expensive when patients are seeking care at the nearest facility, mainly because of transport costs. But, if physical therapy services are free of charge, as it is currently the case for PRCs, higher level of physical therapy services (in PRCs) are less expensive than nearest services (public facilities), regardless of the type of condition. The big difference between public facilities and PRCs (not free) is explained by the distance travelled by patients to come to PRCs, while going to nearest hospital costs them almost no travel cost. A need for transport financial support may be a possible solution to reduce the cost of patient and improve access to physical therapy services.

For mobility aids, cost of lower limb prosthesis is always above the level of catastrophic health expenditures (CHE) for rural areas but if fees are applied. Deliveries of upper-limb prosthesis and wheelchair remain below the level of CHE. Usually persons who received a new prosthetic or orthotic device will have to complete a set of physical therapy sessions. Currently most of PRCs provide free services to their patients, and according to our estimations, for any prosthesis or orthosis provided the patient does not risk catastrophic health expenditures, even if he follows 10 physical therapy sessions. But when PRCs request fees (full or average price, according to patient's score) there is a risk of poverty for patients

when they are seeking for treatment, particularly for lower limb prosthesis and when we include the physical therapy sessions.

Therefore, as some costs have not been taken into account in the estimation of the cost charged to the patient (up-stream costs, down-stream costs, and companion(s)'s costs), there is a high probability that the provision of some devices, especially the most expensive (lower limb prosthesis and orthotics) could conduct to catastrophic health expenditures and notably for people living in rural areas, regardless that the PRC charge fees for services or not. And, if PRCs are handover to the government, fees will be applied to patients, thus there will be a need for better rehabilitation coverage in social protection mechanisms in order to avoid systematic catastrophic health expenditures for patients.

Therefore, some initiatives have been done in Cambodia for the rights of access of persons with disabilities to health and rehabilitation services but there is still much to be done. The health system should be less fragmented, more efficient, with a strong governance and leadership from the government, especially the Ministry of Health and the MoSVY. The provision of rehabilitation services should be strengthening in terms of efficiency, quality and quantity of services. A very strong commitment should be undertaken by the government about physical rehabilitation centers, and regulation policies should harmonize the delivery of services for rehabilitation and health in order to build a sustainable, resilient and efficient health system for the population.

The next chapter is dedicated to the study of Rwanda's rehabilitation sector in terms of economic and financial flows. As previously done in Cambodia, we looked at several elements, namely: a) the provision of rehabilitation services within the health system; b) the financial burden of rehabilitation services for patients; and c) the required expenses in the rehabilitation sector to cover unmet needs.

Chapter 3: Rwanda, a low-income and post-conflict country with a high disability rate and low corruption

1. Introduction

In 1994, Rwanda, a small country in Central Africa, experienced war and genocide. It deteriorated the health system and its infrastructures and services. After these tragic events, the new government started its reconstruction and innovations were initiated that conducted to some positive outcomes. One example is the implementation of the health insurance system.

Before this genocide, the country counted only two rehabilitation centers located in Gatagara and Gahini in the Southern Province. The rates of disability have considerably increased due to genocide and war. In 2002, the National Institute of Statistics in Rwanda estimated 308,501 people with disabilities and the rates were estimated to be 3.8%. The 2012 census estimates 446,456 people with disabilities and the overall rate is estimated to around 5%. This census excludes children under five years (National Institute of Statistics of Rwanda 2012).

The government of Rwanda has enacted social policies and implemented programs aimed at improving the lives and protection of vulnerable populations, in particular people with disabilities. Multiple government institutions and non-governmental organizations implemented programs aimed at improving health, education, employment, local governance and legal protection for these target populations. Handicap International (HI) became the main partner of the government and played a big role in rehabilitating destroyed centers and infrastructures.

Handicap International (HI) launched its operations in Rwanda following the Genocide against the Tutsis in 1994 with the mandate to improve the protection and social integration of vulnerable people, and in particular people with disabilities, by supporting the development of policies and initiatives of the government and the civil society. HI Rwanda, in collaboration with the government, has implemented a broad range of programs aimed at tackling the health and developmental challenges facing people with disabilities. Activities of HI Rwanda can be classified into three main interventions areas: 1) Health, 2) Prevention and 3) Rehabilitation.

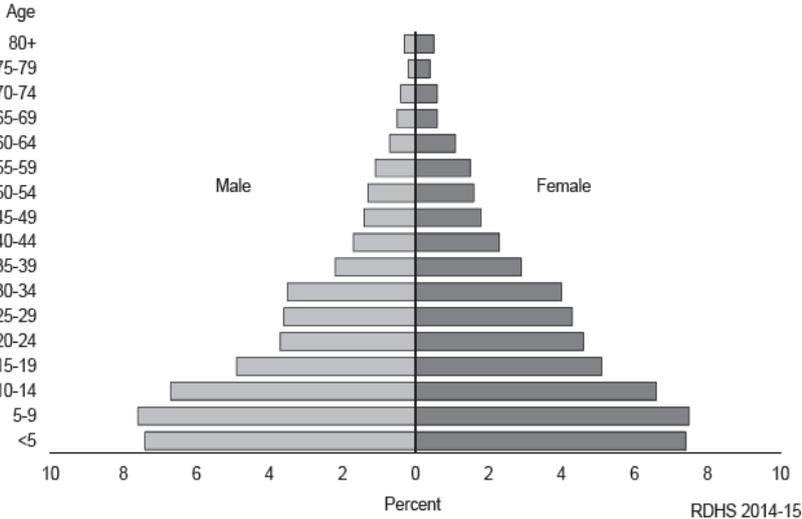
In Rwanda, there are number of social programs that support the poor, but not specifically people with disabilities. Although the introduction of community- based health Insurance (CBHI) gradually improves access to medical facilities among people with disabilities, there are still some barriers to healthcare utilization and perverseness of socioeconomic inequalities in health and healthcare. However, there is limited evidence on the financial access to rehabilitation services for people with disabilities. To date, there has been no comprehensive study investigating the economic system for financial access to physical and functional rehabilitation services in Rwanda.

The purpose of this chapter was to undertake a comprehensive analysis of the physical and functional rehabilitation economic system in Rwanda using an improved Financial Access to Rehabilitation Services diagnostic tools known as “iFAR”. First of all, we will provide an overview of Rwanda’s general context in terms of geographic and sociodemographic, political and economic, and health status and prevalence of disability. Secondly, we will focus on the health system, particularly organization of the health system, the place of rehabilitation services in the health system, the management of these services’ supply, and the financial risk protection coverage for healthcare. Thirdly, we will study financial flows for the rehabilitation service in terms of rehabilitation needs, and health and rehabilitation budgets. Then, we will estimate the average cost of a rehabilitation service in Rwanda. The next part will estimate the cost charged to the patient in comparison to the level of Rwandan catastrophic health expenditures. The final section will be dedicated to the estimation of expenses needed for the rehabilitation sector in Rwanda.

Findings provide an overview of the rehabilitation sector in a given period of time, and highlight the challenges and opportunities that the country has to face to ensure equal access and availability, affordability of quality rehabilitation services. Additionally, this evidence could be used by policy makers, Federation Handicap International Rwanda, Civil society organizations and other development partners involved in movement towards the realization of the rights for people with disabilities in Rwanda. These findings could play a crucial role in guiding the rehabilitation sector planning, in addressing the needs of PWDs and designing effective intervention package that target the most marginalized and vulnerable groups of the society.

the upper age limits, an indication of a population with high birth rate (31.8%). Although the base of the pyramid (age 0-4) remains large, it is narrower than the bars for the age group 5-9. According to the World Bank, this pattern reflects a recent decline in fertility which is 4.197 births per woman in 2014 compare to 4.123 births per woman in 2016

Figure 30: population pyramid in Rwanda



Source: RDHS 2014-2015.

Rwanda is one of the most densely populated countries in continental Africa (430- inhabitants per square kilometer) of arable lands. The proportion of the urban population was 28% in 2014; this proportion is largely lower than the average of sub-Saharan Africa (37%) and the world average (53%).

At the sight of this weakness, a strategy of urbanization and exodus of the rural areas was installed by the government. It aims at reinforcing and achieving the goals towards the development. The realization of these objectives should change the rate of urbanization from 28% to 35% by according to the Vision 2020¹⁵ of the government.

The Human Development Index (HDI) reached the value of 0.524 in 2017 which corresponds to the low human development category, and a classification of 158 out of 189 countries. However, this value increased compared to 2000’s score (0.335). The index value of Rwanda is above the average of countries in the low human development group and below the one of Sub-Saharan African countries (UNDP 2018).

¹⁵ Government of Rwanda, Vision 2020, July 2000

2.2. Political and economic contexts

2.2.1. Political context

Rwanda has obtained its independence in 1962 and it is today a republic with a semi-presidential and multi-party system. Rwanda knew in 1994 one tragic period which in particular led to the massacre of more than 800,000 Rwandan during the civil war; a genocide which started in April 1994 and ended in July of the same year. After that, the country experienced a period of political transition as well as several difficult years before rising against from this test.

In 2003, Rwanda has set up a Parliament comprising two chambers (the Chamber of Deputies and the Chamber of senators) after nine years of transition. Rwanda follows a democratic political system based on the principle of separation of powers; the executive power is based on the semi-presidential model with the President of the Republic, the Prime Minister and the Cabinet and finally the Judicial Powers, with the Supreme Court. Paul Kagame, who had been the unofficial leader since 1994, was elected president in 2003. He was re-elected in 2010 and in 2017 for his third presidential term.

Rwanda has a decentralized system and each province is headed by a governor which called the council of Ministers. Provinces are divided in districts which are directed by a mayor. These districts are divided in sectors which are headed by an Executive secretary. Sectors are divided into cells that head by a Cell coordinator (Ministry of Lands, Environment, Forestry, Water, and Mines 2006).

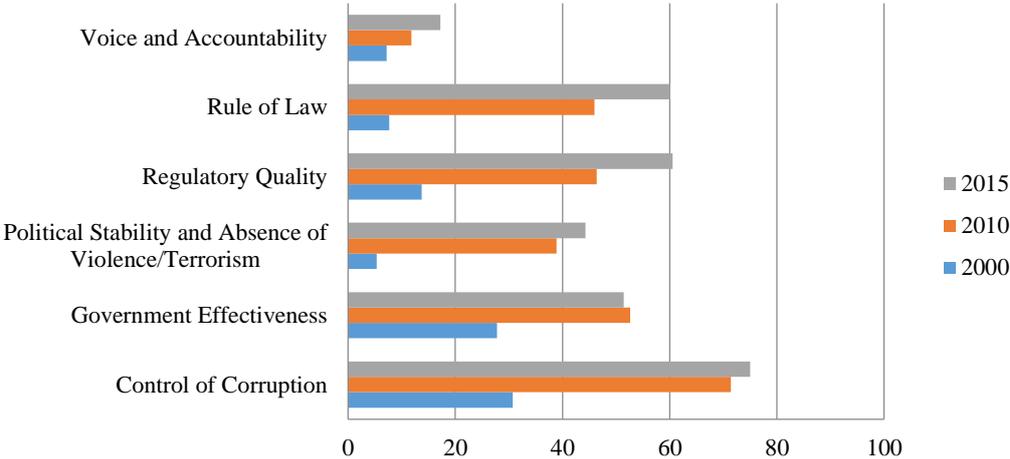
In the ranking of countries under Transparency International corruption index, Rwanda is classified 50th out of the 176 countries in 2016 with a score of 54 out of 100. The indicator “control of corruption” reflects “perceptions of the extent to which public power is exercised for private gain. Point estimates range from about -2.5 to +2.5, higher values correspond to better governance outcomes” (Transparency International 2017). Rwanda is one of the less corrupted countries in Africa.

It is the same opinion considering the classification of the Ibrahim Index of the African Governance (IIAG) is a tool that measures and monitors governance performance in African countries. This index is constituted from four components: safety & rule of law, participation and human rights, sustainable economic opportunity, and human development. According to this classification , Rwanda also passed from the 15th rank out of 52 countries in 2012 to the

9th rank out of 54 countries in 2015, that is to say a better place compared to the other countries of the East Africa (CAE) which respectively occupied the 4th rank for Burundi, the 12th rank for Kenya, the 18th rank for Tanzania, and the 19th rank for Uganda (African Development Bank 2016).

Indicators related to the rules of law, political rights and civil liberties, participation, inclusion and security have all improved in Rwanda since 2000, see Figure 31. However, we observed a more moderate improvement of the indicator “voice and accountability” over the years in comparison to other indicators. This indicator “captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media” (World Bank 2016c).

Figure 31: World governance indicators (%) in Rwanda, 2000-2015



Source: Author, adapted from the Worldwide Governance Indicators Rwanda 2016, World Bank.

2.2.2. Economic context

Rwanda has a strong growth rate of the Gross Domestic Product (GDP) since more than one decade and a half, being established rate on average with 7.9% from 2000 to 2015. Furthermore, the country had an increase of the income per capita from 207 USD to 697 USD during this period (African Development Bank 2016).

According to the CPIA (country policy and institutional assessment), the percentage of the population below the poverty line, US\$1.90 a day as defined by the World Bank, was 57 % (The World Bank 2016). This expansion was drawn by sectors of services and industry. Agriculture sector knew a moderated growth, partly because of unstable weather conditions.

According to the government' strategy "Vision 2020" the growth should be stimulated by investments in energy and transport sectors for the improvement of infrastructures, a constant progression of industry sector, and a resumption of the sector of services. Forecasts indicate a moderated growth for agriculture sector. Inflation should be maintained below the medium-term target of the Central bank. The deficit of the current balance should however remain high short-term, due to export earnings that account for only 25% of imports.

Nevertheless, Rwanda's economy is highly weakened by instability, as adjoining countries. For instance, Burundi's instability may affect Rwanda because on various levels such as the security issues and the burden of the refugees coming from the frontier communities (Leuchowius 2014).

The 4th Household Living Conditions Survey (EICV4) shows that the percentage of farmers whose main job is farming is 71%, of whom 61% are independent and 10% wage farmers (National Institute of Statistics Rwanda 2016). Employment rate of people with disabilities is at 56% which is lower for persons without disability (75%). There is thus more unemployment among people with disabilities. Among employed people with disabilities, self-employment is more common (77%) than among currently employed persons without a disability (68%). Also, 13% are employees compared to 18% among the population without a disability. Main employment sectors among employed people with disabilities are agriculture and forestry or fishing. It should be noted that discrepancies between persons with and without disabilities are partly due to the age structure, as a larger proportion of the elderly work in self-employment and agriculture (Ministry of Finance and Economic Planning and National Institute of Statistics of Rwanda 2014). Therefore, it confirms admitted theories that people with disabilities are more financially vulnerable than persons without disabilities.

2.3. Health status and prevalence of disability

The genocide of 1994 in Rwanda destroyed most of the socio-economical fabric of the country like the health infrastructure. The healthcare system still suffers from the after-effects of the genocide. Although the health status of the Rwandan population improved considerably during last years, there is still place for progress. The medical staff training on advanced levels took much time and was not fast enough to meet the needs for the Rwandan population (Ministry of Health 2014).

Rwanda has seen impressive improvements in health indicators, including the achievement of the Millennium development goals (MDGs) related to health. Maternal mortality ratio (MMR) declined considerably from 1,071 maternal deaths per 100,000 live births in 2000 to 210 per 100,000 live births in 2014/15 (NISR 2015). Life expectancy at birth was 64.6 years for males and 68.4 years for females in 2015.

These strategies among other things are “vision 2020” developed in 2000, Economic Development and Poverty Reduction Strategy (EDPRS 2008-2012), Seven-Year Government Program 2010-2017, Rwandan Health Sector Strategic Plan (HSSP III 2012-2018), Pharmaceuticals - quality plane control (2011-2014), Procurement, Distribution system, Plan for maintenance of equipment, Research Policy (2012) (Leuchowius 2014). The health sector strategic plan 2012-2018 identifies the community health network as a key health infrastructure that contributes greatly to the delivery of health services to the majority of the population who lives and works in the community (UNDP 2015).

During the last 6 years, the prevalence of malaria decreased by more than 50% while the incidence and mortality rate of this disease has decreased by 60% and 70% respectively. However, the country has always approximately 625 doctors in the public hospitals for a population of approximately 11 million inhabitants. But those are shouldered by more than 8,000 nurses and a new body of some 45,000 medical staffs, elected by their own village, to take first aid in the event of malaria, of pneumonia, diarrhea or for antenatal (Ministry of Health 2014).

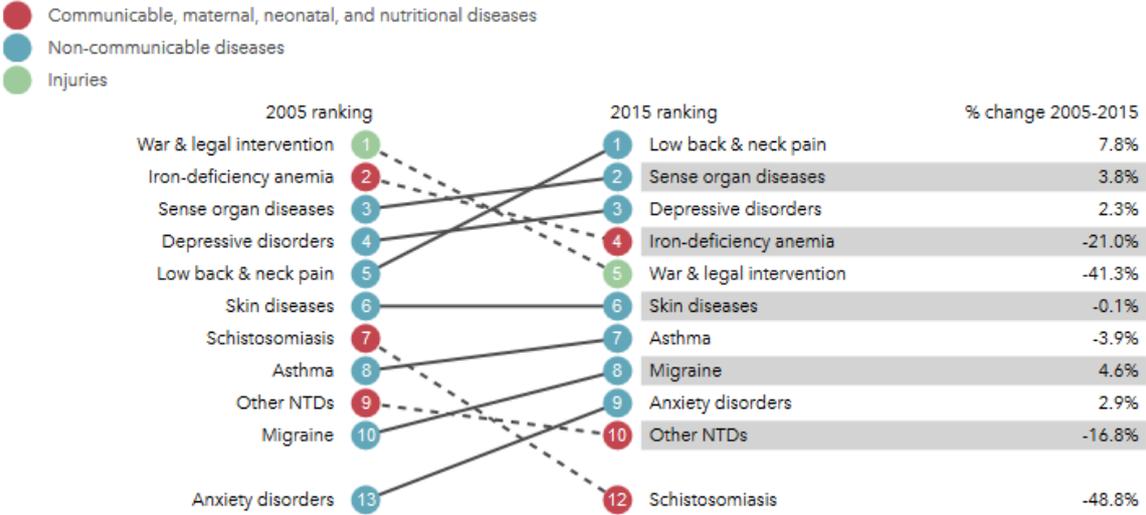
Within the framework of its Vision 2020 and EDPRS II, the government also improved social protection, in particular by subsidizing starting from 2008 the mutual insurance company of health for the poorest households; thus, in 2010, 78% of the households had access to a mutual insurance company of health (African Strategies for Health 2016).

A shortage of human resources in the health sector, rapid growth of the population, and the elevated levels of poverty are big challenges to which the government in the field of health copes (WHO 2014b), this is why the Rwandan government in Health Strategic Plan - Vision 2020 focusses on the following approaches: primary education health care; decentralization; health at Community base; development of human resources; reinforcement of the medical information system; and approaches inter-sector health.

According to the Global Burden of Disease study 2015 (Institute for Health Metrics and Evaluation 2017), the 10 leading causes of disability-adjusted life year (DALY)¹⁶ in 2015 in Rwanda were lower respiratory infect, HIV/AIDS, congenital defects, diarrheal diseases, neonatal preterm birth, neonatal encephalopathy, neonatal sepsis, protein-energy malnutrition, road injuries, meningitis, malaria.

The figure below answers the question “what health problems cause the most disability?” based on YLDs (years lost due to disability) estimations. We notice that non-communicable diseases are the top ranking causes of disability in Rwanda in 2015, and as we wrote in the first chapter, non-communicable diseases are one of the main causes of disability that will potentially lead a person to seek for rehabilitation care.

Figure 32: Top 10 causes of disability by rate in 2015 and percent change 2005-2015 (YLDs) in Rwanda



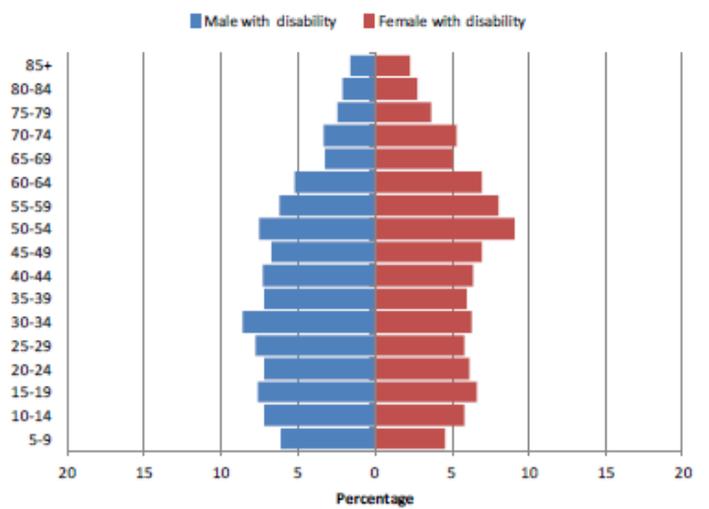
Source: Global Burden of diseases study 2015, IHME

The age structure of the population with disabilities is very different from the general population. Only 29% of males with disabilities and 24% of females with disabilities are between 5 and 24 years old. Among males with disability the population is relatively evenly spread over age groups from 15 to 54. Among females with disabilities a “bulge” in the

¹⁶ One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability. DALY is the sum of years of life lost (YLL) to premature mortality in the population and the Years Lost due to Disability (YLD) for people living with the health condition or its consequences. (‘WHO | Metrics: Disability-Adjusted Life Year (DALY)’ 2017)

pyramid is observed between age 55 and 64 (see Figure 33). For people with disabilities, the age structure among males is thus overall slightly younger than among female (National Institute of Statistics Rwanda 2016).

Figure 33: Age pyramids of population with disabilities age 5 and above (%)



Source: National Institute of Statistics of Rwanda 2016

3. Overview of the health system

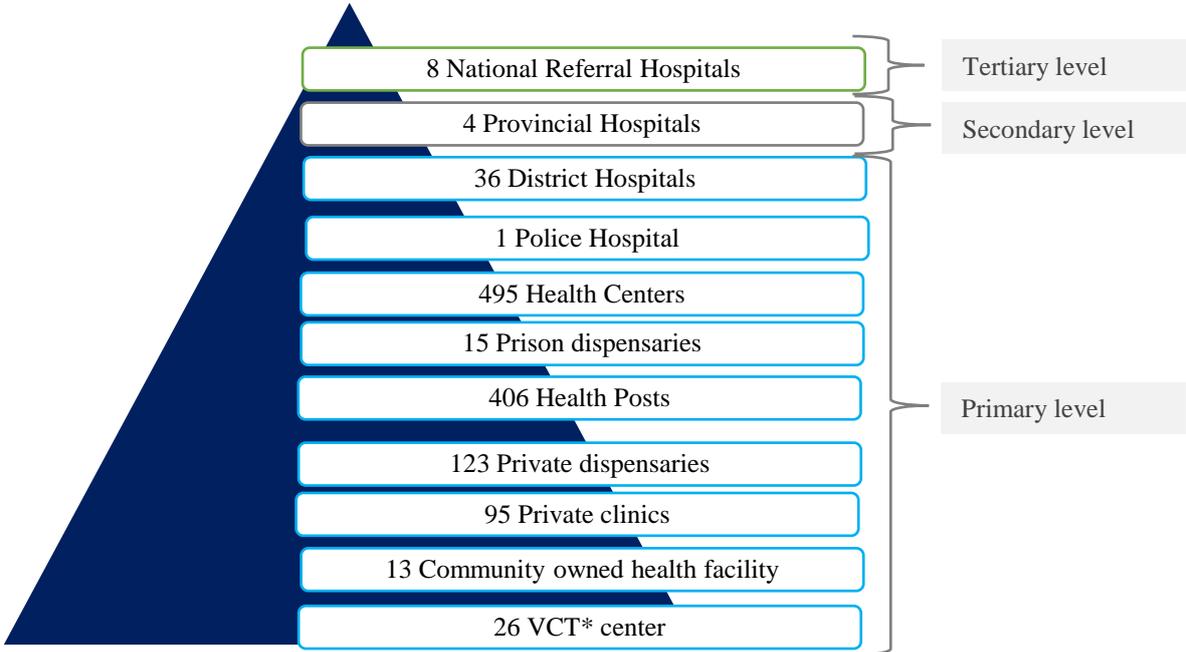
3.1. Health system

Since the Genocide of the Rwanda (1994), Rwanda health system has been under progressive reconstruction. The health system has been highly supported by development partners and Rwanda needs to take over to respond to the emerging health priorities.

The health system has a pyramidal structure, consisting of three levels: Tertiary, secondary, and primary (Figure 34). (1) *The tertiary level* includes the Ministry of Health, Rwanda Biomedical Center (RBC) and the National referral hospitals. This level elaborates policies and strategies, ensure monitoring and evaluation, capacity building and resource mobilization. It organizes and coordinates the secondary and primary levels of the health system, and provides them with administrative, technical and logistical support (Ministry of Health 2015). (2) *The secondary level* includes provincial hospitals. The coordination of actors is ensured by the Joint Action Development Forum where all important development issues are discussed and collaborative interventions across sectors are designed and monitored. The aim of this

level is to coordinate the different actors of the health sector at the decentralized level to clarify and allocate the tasks of the different actors, and ensure an adequate integration of the multidimensional determinants of the health status of the population (Ministry of Health 2015b). And (3) *The primary level* consists of an administrative offices, district hospitals, a network of health centers that are either public, government assisted faith based, or private (Ministry of Health, 2015c).

Figure 34: Rwanda public health system, 2017



*VCT: voluntary counseling and testing for HIV

Source: Author, adapted from Health facilities database, HMIS unit, Ministry of Health of Rwanda, National Institute of Statistics Rwanda (2017).

In 2017, the Ministry of Health recommended that districts hospitals operating in Western Province should improve the quality of health care services provided. Hospitals directors agree with this statement but declared that the achievement of this objective will be possible only with a reinforcement of human resources for health, medical equipment and an increase of their budget (Ministry of Health 2017b).

Mission of the Rwandan health system according to the 2015 Health Sector Policy guiding principles: “to provide and continually improve affordable promotive, preventive, curative, and rehabilitative health care services of the highest quality”.

The HSSP II Key priorities are:

- Sustain MDGs achievements: MCH and fight against infectious diseases and invest in prevention and control of NCDs.
- Improve accessibility to health services: financial, geographical and community health.
- Improve quality of health provision: QA, training, medical equipment, supervision.
- Reinforce institutional strengthening: towards district health services, DHU.
- Improve quantity and quality of HRH: planning, quality and management.

In Rwanda, national tariffs of public and private health facilities are implemented in the country. Since 2017, a list of tariff for prosthetics and orthotics devices was applied in all services (see Appendix) (Ministry of Health, Republic of Rwanda 2018).

3.2. Localization of the rehabilitation sector within the health system

The figure below shows the rehabilitation sector within the health system. The rehabilitation sector contains physiotherapy, occupational therapy, and prosthetics and orthotics services. Actors working in the rehabilitation sector are the following:

- **MoH:** The Ministry of Health elaborates policies and strategies, ensure monitoring and evaluation, capacity building and resource mobilization. It holds responsibility for central functions such as policy and priority setting, financial management, budget execution, and audits (Ministry of Health, 2015c).
- **RBC:** The Rwanda Biomedical Center (RBC) is the implementing arm under the Ministry of Health for most of the health programs such as the Institute of HIV/AIDS, Disease Prevention and Control, the Medical Production and Procurement Division, the Biomedical Services Division, Rwanda Health Communication Center, the Medical Research Center and the Planning, and Business Strategy Division (Ministry of Health, 2015c).
- **NCPD:** the National Council of People with disabilities is a public and independent institution with legal personality and both financial and administrative autonomy.

They shall assist the Government to implement programs and policies that benefit people with disabilities.

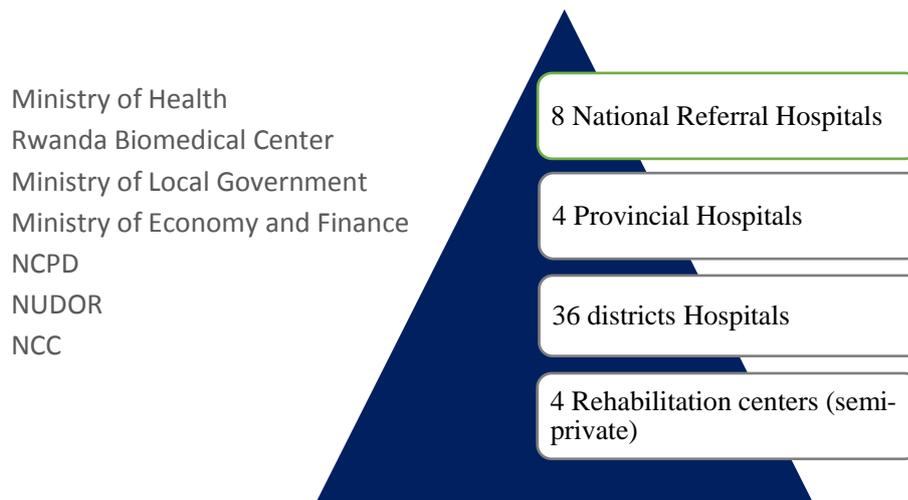
- **NUDOR:** The National Union of Disability Organizations in Rwanda (NUDOR) exists to strengthen the voice of the disability movement in Rwanda. It is an umbrella organization established in 2010 by eight organizations of people with disabilities. His key activity is advocacy to ensure the realization of equal rights, opportunities and participation for people with disabilities (RENCP 2012).
- **MINALOC:** The Ministry of Local Government ensures the coordination of good governance and high quality territorial administration programs that promote economic, social and political development throughout the nation¹⁷. There have many responsibilities such as the development of the legal framework for good governance, promoting a sector policy for social affairs.
- **MINECOFIN:** The Ministry of Finance and Economic Planning was formed in March 1997 from the joining of the Ministry of Finance and the Ministry of Planning. The key mission is to raise sustainable growth, economic opportunities, and living standards of all Rwandans¹⁸.
- **NCC:** The National Commission for Children have the mission to enhance child rights by coordinating, implementing, overseeing and monitoring the child protection system to give Rwanda's children the opportunity to develop into productive and responsible citizens, of which will endeavor to achieve¹⁹.

¹⁷ <http://www.minaloc.gov.rw/index.php?id=11>

¹⁸ <http://www.minecofin.gov.rw/index.php?id=37>

¹⁹ <http://www.ncc.gov.rw/index.php?id=11>

Figure 35: Rehabilitation sector in the public health system



Source: Author, adapted from Health facilities database, HMIS unit, Ministry of Health of Rwanda.

There is no rehabilitation service at health center level. During our interviews with professionals of rehabilitation in facilities providing rehabilitation care, physiotherapists often mentioned the heavy workload of their service due to the high demand for physiotherapy and the limited number of physiotherapists to address this demand. Majority of them suggest that the opening of a basic physiotherapy service with at least one qualified physiotherapist at health center level should probably ease congestion of current physiotherapy service. They argue that some patients, with cerebral palsy or clubfoot, required regular and basic treatment, close to their living place in order to reduce transport and opportunity costs, and diminish their difficulty of moving to the service, due to their disability.

This remark was also observed among a majority of patients we interviewed in rehabilitation facilities visited. Patients complained about the distance and the related cost for the patient and the companion. Some of them share with their wish to be able to receive physiotherapy care at health center level. We can thus suggest that there is a high demand for availability of rehabilitation services at health centers level.

As there is a physiotherapy department or unit in national referral hospitals, provincial hospitals, and district hospitals, we estimated that there are 48 physiotherapy services in the public health system in Rwanda that represents 3.93% of public health facilities. We can add to this figure, the number of semi-private rehabilitation centers (4), and there are thus 52 physiotherapy services.

The number of prosthetics and orthotics services required in a given country is estimated to be 1 service at national center level, 2 at provincial center level, and 10 at district center level (WHO and ISPO 2005). It is also estimated that it should have a referencing from community to district level by 100%. Thus, P&O services at district level can offer treatment for around 80% of people who have referred. The 20% left will have to be referred at provincial level. At provincial level, among the 20% of persons referred, 30% will have to be referred to the national level in order to receive adequate care and treatment (WHO and ISPO 2005; WHO 2005). For P&O services in Rwanda, we estimated, according to the MoH data that 16 services exist and they are provided by the 4 semi-private rehabilitation centers, 4 Provincial Hospitals and the 8 National Referral hospitals. The P&O services at tertiary level (provincial and national hospitals) represent 0.98% of public health facilities.

3.3. Management of rehabilitation services supply

In this section we are interested in the management of the rehabilitation service supply in terms of human resources for rehabilitation, mainly composed of physiotherapists and professionals of prosthetics and orthotics services.

As many low- and middle- income countries, there is a shortage of human resources for health in Rwanda. This shortage of professionals in the health system also appears for rehabilitation professionals. The two tables below show the current situation of human resources for rehabilitation in Rwanda in 2017, based on data collected during interviews with key stakeholders and health professionals. However, prosthetists and orthotists (P&O) of the category I (ISPO) do not appear in the table as there are no qualified Rwandan professionals working in the country.

In addition to specific rehabilitation professionals associations, there is the Rwanda Allied Professions Council (RAHPC). The RAHPC is a council that aims to regulate, supervise, control and enforce standards of ethics, among health practitioners and institutions. That includes all rehabilitation professionals in Rwanda.

3.3.1. Physiotherapists, Occupational therapists and speech therapists

Physiotherapy

According to the College of Medicine and Health Science (CMHS) of the University of Rwanda, there are 366 physiotherapists who have been trained since the beginning of the education and training in Rwanda in 1996. And about 90% (331) are currently practicing as PT in Rwanda in 2016 (Table 35).

Table 37: Distribution of functional rehabilitation professionals in Rwanda, 2017

Functional rehabilitation	Physiotherapists	Occupational therapists	Speech therapists
Number of professionals (total)	366	4	3
Number of professionals in practice	331	4 Trained in neighboring countries	3
Density of professionals (per 10,000)	0.29	0.003	0.003
Number of professionals in training	74	42 1 st graduation in 2018	0
Average number of new students enrolled per year	17	14	0
Minimum educational qualification required	Bachelor (4 years) since 2006	Bachelor (4 years)	Not defined yet
Educational institute that provide degree or diploma courses for training professionals	University of Rwanda, CMHS	University of Rwanda, CMHS	Not available yet, ongoing project
Professional association	Association of Rwandan Physiotherapy	Rwanda OTs association (RWOTA)	No professional association existing yet
Estimated % of professionals who emigrated abroad or who is no more working in rehabilitation field	9,56%	0%	0%

Source: Author, based on data collected.

The density of health workers (physiotherapists, occupational therapists and prosthetics and orthotics) represents a critical starting point for understanding the health system resources situation in a country. This indicator provides the stock of health workers relative to the population (WHO 2010b). The density of health workers for rehabilitation is 0.29; it means that there is around 0.3 PT for 10,000 persons in Rwanda. To obtain a satisfying ratio, Rwanda will need to increase its stock of physiotherapists by 3.5 times, so it will represent a stock of 1,158 professionals. According to these estimations there is thus a gap of about 828

physiotherapists in Rwanda. But, if we estimated the density of PTs for 10,000 persons based on the estimation of people who need rehabilitation care, we obtained 14.25.

According to the NIS (National Institute of Statistics Rwanda 2016), 125 physiotherapists are working in the public sector in 2015, it thus means that around 206 PTs work in the private or semi-private sector. The CMHS estimated that there is around 4% (15) of PTs who are no more working in the rehabilitation field, and around 5% (20) of PT that emigrated abroad since 22 years.

74 physiotherapists' students are currently enrolled, with an average of 17 graduated students per year since 1996. This number of students is relatively stable within the last decade.

Occupational therapy

We estimated that there are around 4 occupational therapists working in Rwanda. These OTs have not been trained in the country. However, the government of Rwanda implemented 4 years ago a comprehensive training for OTs at the CMHS. Currently, around, 42 students are enrolled in educational training. The first Rwandan OTs qualified will be graduated in 2018. The challenge of being hire in health facilities and being recognized as a para medical professional remain important for these new professionals.

Speech therapy

There is currently no program to train speech therapists in Rwanda. There is an ongoing work on the development of a curriculum for a bachelor degree, but there is no estimated date for the official launch of this education and training for speech therapists.

3.3.2. Professionals of prosthetics and orthotics services

There is no P&O of category I (ISPO) in Rwanda. According to the College of Medicine and Health Science (CMHS) of the University of Rwanda, there are 48 orthopedic technologists (P&O category II, ISPO) who have been trained. And about 46 are currently practicing as

orthopedic technologist in Rwanda in 2016, as it is estimated that around 2 professionals are currently unemployed.

Table 38: Distribution of physical rehabilitation professionals in Rwanda, 2017

Physical Rehabilitation	Prosthetist-orthoptist, cat I (OMS-ISPO)	Orthopedic technologist, cat II (OMS-ISPO)	Technicians cat III (OMS-ISPO)
Number of professionals (total)	0	48	No figure
Number of professionals in practice	0	46	No figure
Estimated % of qualified P&O (cat I) and orthopedic technicians (cat II) that emigrate?	No figure	2	No figure
Density of professionals (per 10,000)		0.04	
Estimated number of persons who need P&O services (ISPO/WHO)		58,048	
Density of professionals in persons who need P&O's population (per 10,000)		8.27	
Number of professionals in training	No figure	36	No training available for technicians
Average number of new students enrolled per year	0	18	0
Minimum educational qualification required in the country	Not defined	3 years	Learning in the job
Minimum educational qualification required, according to ISPO/WHO	4 years formal structured education leading to University degree (or equivalent)	3 years formal structured education lower than degree level	2 years formal structured or 4 years on-the-job or in house training
Educational institute that provide degree or diploma courses for training professionals	No institute	1, the CMHS	No institute
Professional association	ISPO Rwanda Member Society		

Source: Author, based on data collected.

There is not P&O of category I (ISPO) in Rwanda. According to the College of Medicine and Health Science (CMHS) of the University of Rwanda, there are 48 orthopedic technologists (P&O category II, ISPO) who have been trained. And about 46 are currently practicing as orthopedic technologist in Rwanda in 2016, as it is estimated that around 2 professionals are currently unemployed.

The density of professionals for P&O cat II is 0.04 for the global population and around 8.27 in the estimated population who need P&O services.

Currently, 36 students are enrolled in the CMHS for a full-time course for 3 years to become orthopedic technologist cat II. And there is an annual average of 18 new students enrolled in these classes each year. P&O professionals have a national association, accredited by ISPO, the ISPO Rwanda Member Society. Therefore, the formation offered in the CMHS corresponds to international recommendations.

We used the WHO methodology to assess the number of persons who need a P&O device and the number of human resources required (WHO and ISPO 2005) in order to compared the expected values in Rwanda according to WHO/ISPO recommendations, as shown in the table 39. We compared each value to the standards defined by WHO and ISPO.

Table 39: Estimation of P&O professionals required according to ISPO standards

	Current situation in Rwanda	Expected values in Rwanda	Standards as defined by WHO/ISPO
Total population in Rwanda (2015)	11 609 666	11 609 666	10 000 000
Estimation of the number of persons who need a P&O device			
Total population in selected area	58 048	58 048	50 000
Nb of devices required per year	19 349	19 349	16 667
Nb of persons referring to district center level	0	19 349	16 667
Nb of devices in district level	0	15 480	13 333
Nb of persons referring to provincial center level		3 870	3 333
Nb of devices in provincial center		2 709	2 333
Nb of devices in national center		1 161	1 000
Number of prosthetist/orthotist - cat I and/or orthopaedic technologist – cat II required			
in district centers	0	52	44
in provincial centers		11	9
in national center		9	8
Number of technicians - cat III required			
in district centers	0	26	22
in provincial centers		38	33
in national center		9	8

Source: Author.

To date, there is no prosthetics and orthotics (P&O) service at district level and 52 P&O categories I or II should be implemented at district centers, 11 at provincial center, and 9 at national centers. It is recommended to develop P&O services at this level to facilitate referencing to the upper level (provincial) and then to the national level. In Rwanda

referencing is only done from provincial (rehabilitation centers) to central level (national referral hospitals).

3.4. Financial risk protection coverage for healthcare

3.4.1. Overview

The National Social Protection Policy defines social protection as “a set of public and private initiatives enabling to provide transfers of income or consumption to the poor, to protect, in particular, the vulnerable and the marginalized against welfare risks and improve their social status and rights as a whole with the overall objective of promoting the welfare of the population” (Shyirambere 2017). The key social protection programs placed under the direct responsibility of the Ministry of Local Governance (MINALOC).

In regards to people with disabilities, the Social Protection Strategy elaborated in 2011 had planned to focus on strengthening programs across government that empower them PWDs were to be given greater access to relevant government programs, both by improving current plans for persons with disability and also by monitoring the access of people with disabilities to all public services.

The MINALOC introduced a poverty categorization based on income and estate of each person, *Ubudehe*. Initially 6 classifications were made. To date, four categories exist according to households’ socio-economic status and their property in terms of land and belonging and what the families’ breadwinners do to earn a living. The city of Kigali has more middle income citizens (57.6 %) in the 4th category. The new *Ubudehe* classification started with a pilot phase in five districts in 2014 and was conducted in all districts by February 2015. The new categories will start to be used in July 2017. The table 40 shows categories and details in terms of coverage, and criteria used.

Table 40 : Ubudehe categorization in Rwanda, 2015

Categories	Coverage	Coverage rate	Criteria
Category I	376,192 households or 1,480,167 people	16%	This category includes households without shelter and who are very low income earners with difficulties to access to food and to pay for a rent.
Category II	703,461 households or 3,077,816 people	29.8%	It covers masons, those who can rent a simple house and those who have their own houses but not decent, etc.
Category III	1,267,171 households or 5,766,506 people	53.7%	It includes people who do not deserve to be supported by government as they are self-reliant in their social life.
Category IV	11,664 households or 58,069 people	0.5%	It includes director generals up to the president of the republic and big companies, exporters, high service providers and others

Source : Author, adapted from (Nkurunziza 2016)

Vulnerability in the context of the *Ubudehe* is defined as the risk of being in poverty today or falling into poverty in the future. Consequently, disability is not considered as a vulnerability criterion in Rwandan social protection programs if the person is not listed in the 1st or 2nd *Ubudehe* categories.

Thus, under the MINALOC, they are key social protection programs: the Vision 2020 Umurege Program (VUP), the Genocide Survivors Support and Assistance Fund (FARG), the Rwanda Demobilization and Reintegration Commission (RDRC), the *Ubudehe* program.

The law n°45/2010 established RSSB after the merge of CSR with RAMA into one organization for a reinforcement of governance and harmonization of social security services. Since, the CBHI has been integrated into RSSB.

Disability is a crosscutting issue, and social protection mechanisms do not always take into account the need of people with disabilities. de facto, people with disabilities are only considered in social protection when they belong to *Ubudehe* categories 1 and 2, otherwise they do not benefit from any financial assistance (NUDOR 2017).

According to the law of 2008, health insurance scheme is mandatory. All Rwandan, including people with disabilities must be covered by a health insurance. Different health insurance schemes co-exist and complement each other through their different target population.

The table 41 provides some details about the “*mutuelle de santé*” (CBHI). This scheme, under the Rwanda Social Security Board (RSSB), provides coverage to informal sector workers.

CBHI was designed to improve access to health care for the population of the informal sector and the rural population. The CBHI made possible the commitment of the government to expand health insurance coverage. This scheme has the highest health insurance enrolment in Sub-Saharan Africa (Chemouni 2018). Furthermore, donors' fund played a key role in the expansion of CBHI, even if analysis shows that it was primarily thanks to the Rwandan government (demand side) rather than the donors of aid (supply side) (Chemouni 2018). The CBHI pilot was initiated by the Ministry of Health that asked USAID for technical and financial support. Then, the government convinced the Global Funds to Fight Aids, Tuberculosis and Malaria to fund the scaling-up of the CBHI through a “health system strengthening” grant and well managed scheme (Chemouni 2018). The CBHI includes all segments of the population, especially vulnerable groups including people with disabilities. The CBHI covers physiotherapy services, prosthetics and orthotics services are excluded from the healthcare package.

Table 41: Overview of the CBHI / Mutuelle de santé in Rwanda

Target population	CBHI is a relatively diverse pool covering both the poor/vulnerable people and non-rich informal workers		
Insurance premiums	<p>CBHI beneficiaries pay premium according to their Ubudehe stratification:</p> <ul style="list-style-type: none"> • Category 1: 2,000 Rwf per beneficiary and per year (fully subsidized by the government and its partners) • Category 2: 3,000 Rwf per member per year • Category 3: 3,000 Rwf per member per year • Category 4: 7,000 Rwf per member per year 		
Services covered	<p>The Ministry of health specified CBHI benefit packages at each level (community, health post, health center, district, provincial and referral Hospitals).</p> <p>Benefit package in public health facilities: CBHI beneficiaries are by law entitled to a comprehensive range of preventive and curative services throughout the country in public and faith-based health facilities. CBHI health care benefits include inpatient and outpatient care provided at each level public healthcare delivery system as well as a list of essential drugs. It is however, important to take a closer look at the healthcare benefits covered by CBHI per level</p> <p>At the Health post & at the Health central level: all medical services specified in the Minimum package of activities which include preventive, curative services, ambulance, laboratory and pharmacy services</p> <p>At the district Hospital level: the CBHI covers the complementary package of activities (including physiotherapy, and occupational therapy services, ...) and ambulance bill</p> <p>At the referral Hospital level: the CBHI covers services defined under the tertiary package of activities as well as the ambulance bills.</p> <p>Private health care facilities, including those that provide rehabilitation services to people with disabilities</p> <p>Recently, CBHI has concluded a contract with some private health facilities including private healthcare posts and HVP Gatagara to offer some rehabilitation services.</p> <p>Referrals can be approved by RSSB Medical Committee to King Faisal Hospital (tertiary private hospital)</p>		
Coverage rate (2017/18)	84% of all Rwandan population	Coverage rate for people with disabilities (2018)	95.3%
Comments	CBHI is a substantial pool in Rwanda as it is the largest insurer in Rwanda covering the informal sector.		

	<p>However, CBHI has limited resources to cover the beneficiaries' needs, and there is also the issue of limited financial capacity of CBHI to cover the full cost.</p> <p>Health centers serve as gatekeepers to mitigate moral hazard at the Hospital levels.</p> <p>A referral system is used to determine the route by which different services are accessed.</p> <p>As of now, CBHI is managed as a separate insurance scheme / pool despite its move to RSSB.</p> <p>Although the scheme is financed primarily by the insurance premiums, GoR and development partners still provide financial support to CBHI to fill the funding gap.</p> <p>Government contribution equivalent to 13% of the domestic annual budget of the MoH (law CBHI).</p> <p>Important Sanctions to : Non-membership in the health insurance scheme (from 5,000 RwF to 10,000 RwF), and to unlawful use of member card of CBHI (from 5,000 RwF to 10,000 RwF)</p>
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Source: Table populated based on CBHI law, official Gazette n°15 of 13/04/2015.

The former RAMA (*“Rwandaise d’Assurance Maladie”*), now called the RSSB medical scheme, established in 2001, targets formal sector employees and their dependents. Other health insurance schemes that operate in Rwanda include the Military Medical Insurance (MMI), the Medical Insurance Scheme of the University of Rwanda (MIS-UR) and over ten licensed private health insurance schemes such as SONARWA, SAHAM, UAP, Prime, Britam, BK or Mayfair (BNR 2017).

Table 40 provides a summary of existing social protection schemes in Rwanda. Some strengths of the RSSB schemes are the strong support from the government and the strong local, regional and international partnership and cooperation. but, in its Strategic Plan 2015-2020 (RSSB 2015), RSSB highlighted a low coverage rate of the population and a low compliance level from health facilities, as well as some fraud issues. For RAMA and MMI, weaknesses are found in the limited coverage of the population, and the exclusion of prosthesis and orthosis services from their package of care covered. However, the Ubudehe program covers almost all the Rwandan and offer a wealthier pay for the poor.

Table 42: Overview of social protection landscape in Rwanda

Social protection schemes	Operator	Type	Services coverage	Coverage of rehabilitation services	Premiums	Coverage	Target population
Ubudehe program	MINALOC Vision 2020	Mandatory				All districts.	People with disabilities are considered vulnerable when they belong to categories 1 and 2 and thus can benefit from any social assistance
RSSB: Medical Scheme (formerly RAMA)		Mandatory	RSSB covered medical treatment and prescribed drugs by 85%.	Physiotherapy and lower/upper limb prosthesis and orthosis	The RSSB tariff is a reimbursement made of a flat amount equivalent to 6,9995 RwF. 15% of employee's basic salary. Paid by both the employer and the employee at the rate of 7.5% each. For pensioners, 7.5% contribution is deducted from their monthly pension.		Civil servants, pensioners who previously contribute towards medical care and private institutions
RSSB: Pension schemes		Mandatory for salaried workers and active political representatives Voluntary for individual members			Contribution rates are 3% paid by the employer and 3% by the employee.	94.9% (2016) of targeted population	Retired community and their dependent
RSSB: Occupational hazard		Mandatory	Work insurance, free medical care, daily sickness allowances, incapacity social security benefits, incapacity lump sum benefits, survivors' benefits.		% of salary paid on behalf of members by employers		Employees, survivors, and their family

Social protection schemes	Operator	Type	Services coverage	Coverage of rehabilitation services	Premiums	Coverage	Target population
RSSB : CBHI - Mutuelle de Santé	MoH		Public: Drugs and medical services provided at: health post, health centre, hospitals of District or Province, hospitals or referral hospital level. Private: health care facilities which concluded a contract with the public institution in charge of CBHI.	Physiotherapy, when available.	Variable according to Ubudehe categories (from 2,000 Rwf to 7,000 Rwf)		Poor and vulnerable people
Health Insurance: RAMA			All medical services (public and private) Except ARVs, glasses and prosthesis	Physiotherapy	15% of employee's basic salary. Paid by both the employer and the employee at the rate of 7.5% each.	3.2% of the population and 1.3% of people with disabilities	Victims of the genocide, prisoners
Health Insurance: MMI		Mandatory	Primary health care in public health centers, district and reference hospitals	Physiotherapy	Members paid 5% of their salary and government paid 17.5%	0.5% of the population and 0.3% of people with disabilities	Military membership
Health Insurance: FARG	MINALOC Vision 2020		All medical services (public and private), except ARVs. Eligible persons receive cash transfer, medical care and education scholarship	Physiotherapy	Each member paid 1% of basic salary and the government paid 5%.	0.5% of the population and 1.8% of people with disabilities	Genocide survivors
VUP	MINALOC Vision 2020		Financial assistance and services		Co-payment. Each member has an account and fees to open it are 8,000Rwf.	80% (2014)	Public workers of categories 1 and 2. + loans for categories 1, 2 and 3
RDRC	MINALOC						

Social protection schemes	Operator	Type	Services coverage	Coverage of rehabilitation services	Premiums	Coverage	Target population
Other	Vision 2020					0.7% of persons without disabilities	
	NGOs School Employers Other					And 1.1% of people with disabilities	

**FARG: Genocide Survivors Support and Assistance Fund; RDRC: Rwanda Demobilization and Reintegration Commission; VUP: Vision 2020 Umurenge Program*

Source: Adapted and expanded based on initial information from East African Community (East African Community 2014) and Health Financing Strategic plan 2018-2024 (Ministry of Health 2019)

3.4.2. Progress towards the universal health coverage

Rwanda has taken many health sector reforms. The one of particular interest is the health insurance reform and extension of coverage through mutual health organizations. This program was implemented in three districts between 1999 and 2001, the second phase between 2002 and 2005 in the other districts and the third in 2006. Many practices has been used by the Rwanda's Government to achieve objectives of the universal health coverage as preconized by the World Health Organization such as the selection and management of destitute people which namely Ubudehe, resource mobilization mechanisms for the granting of microcredit to facilitate Mutual health subscription, raise community awareness on the importance of Mutual Health Organizations coverage and the synergy between Mutual Health Organizations and other health system processes (performance-based financing and quality assurance) with a view to improving health care quality and political leadership (Musango and al. 2013).

Five basic factors highlight the Rwanda commitment to move towards UHC:

- The long-term strategy Vision 2020 with a strategic social protection through universal access to health care (2000);
- The “Rwanda's National Policy on Mutual Development”(2004) ;
- The Law N° 62/2007 of December promulgated in March 2008 which states that all Rwandan residents must be affiliated to a health insurance scheme that provides quality health care;
- The Rwanda Community Based Health Insurance Policy 2010;
- The Rwanda National Health Insurance Policy 2010 (Nyandekwe and al. 2014).

These factors prove the willingness of the Rwanda's government to achieve the three goal of universal health coverage.

In its 4th health sector strategic plan 2018-2024 (Ministry of Health 2019), the Ministry of Health plans to invest in specific rehabilitation services including prostheses in aim to reduce the incidence of non-communicable diseases and improve the treatment of preventable disabilities by 2024. Moreover, the government plans to include physiotherapy and rehabilitation in the current package of Maternal and child care in health centers, and to

improve the package of district hospitals to provide better secondary healthcare particularly through physiotherapy and rehabilitation services.

According to the key indicators of the Universal Health Coverage of WHO, the health insurance coverage in Rwanda in 2012 was 96.15% and 1.07 visits per capita per year versus 1 visit recommended by WHO. Moreover, around 24.8% indigent people subsidized versus 24.1% living in extreme poverty. The package of services, the rights-based approach and the quality of health care are excellently achieved, the financial-risk protection was 10.80% versus less than 40% as limit acceptable of catastrophic health spending level (Nyandekwe, Nzayirambaho, and Kakoma 2014). In 2008, the medical care utilization for under five children with diarrhea, or fever are 33% and the utilization of skilled-birth attendants was 67% in 2008 (Lu and al. 2012).

3.4.3. How are these systems link to the legal framework of the country?

The Rwandan context is characterized by the adverse effects of the 1994 Genocide against the Tutsi, which resulted in many additional people with disabilities as well as mental health challenges.

The **United Nations Convention on the Rights of Persons with Disabilities** (UNCRPD) was signed in 2007 which serves to protect, to respect and to promote their rights throughout the world. The rights of people living with disabilities have been continuously strengthened on a national level. The Government of Rwanda ratified in 2008 the UNCRPD and the National Social Protection Strategy including programs to empower persons with a disability. The constitution stipulates for example equality between all Rwandans and prohibits any sort of discrimination based on disabilities. The general principles of the convention are ensuring for people with disabilities the things followings: the respect and acceptance; the non-discrimination, independence; inclusion in society; the equality of opportunity and the accessibility (Shyirambere 2017).

Furthermore, the Rwanda government has established a **National Council of Persons with Disabilities** (NCPD) in 2011 with the aim of mobilizing and representing the views of people with disabilities and to monitor the application of laws and other policy instruments. The National Council of People with disabilities (NCPD) has been assigned the responsibility of oversight and coordination of these diverse efforts to fully include children with disabilities in

the country's development agenda. Health policies state that the Government of Rwanda should provide people living with disabilities with wheelchairs, prostheses etc. but there is no mechanism to implement it (Leuchowius 2014).

To achieve the Goals, the Government of Rwanda also adopted the law to protect the rights of PWDs and has passed eight ministerial orders to implement the law (Institute for Health Metrics and Evaluation 2017).

Health policies state that the Government of Rwanda should provide people living with disabilities with wheelchairs, prostheses etc. but there is no mechanism to implement it (Leuchowius 2014).

4. Financial flows for the rehabilitation and disability sector

4.1. Estimation of rehabilitation needs

According to Handicap International estimations (Letourmy 2014), 2% of the population in developing countries is estimated as requiring rehabilitation care (all services). In Rwanda, we estimated that around 232,193 persons need rehabilitation care. As there are around 331 professionals working in physiotherapy services in Rwanda, we estimated that there is about 1 PT for 701 persons who need physiotherapy care. We also counted 52 physiotherapy services within Rwanda, thus each service should provide physiotherapy services to 4,465 persons needing it.

The World Health Organization (WHO) and the International Society for Prosthetics and Orthotics (ISPO) (WHO and ISPO 2005) defined that 0.5% of the population in developing countries needs P&O devices. In Rwanda around 58,048 persons need P&O devices²⁰. If we consider that a person keeps a P&O device for at least 3 years (WHO and ISPO 2005) we can estimate that 19,349 devices are required per year.

Adding that there are 16 P&O services, we estimated that each service should provide care to 3,628 persons in need of a P&O device. And there are 48 Orthopedic technologists (ISPO cat

²⁰ Based on 2015 population data equals to 15,577,899 (World Bank 2016e)

II) working in rehabilitation facilities, it means that there is a ratio of 1 P&O cat II for 403 Rwandan people needing P&O devices with considering that a P&O is for 3 years.

4.2. Financial situation of health and rehabilitation in Rwanda

4.2.1. Trends of Rwanda health expenditures

Health expenditures can be tracked using resources tracking tools such National Health Accounts and Health resources Tracking tool (HRTT). Data from the 2010 National Health Accounts show that total health expenditure²¹ (THE) in Rwanda increased from Rwf 78.4 billion in 2003 to 244.6 billion in 2010. In real terms, THE reached 11.1% of GDP in 2012/13 (compared to 10.7% in 2006 and 6.6% in 2003)²². While information on recent trends in total health spending was not available due to missing data in the Rwanda Health Resource Tracking Tool (HRTT)²³ system, the latest findings using HRTT revealed an upward trend in total health budgets and spending. Expenditures for health sector have gradually increased from RWF 267 billion in FY 2010/11 to RWF 346 billion in FY 2014/2015, representing a compound annual growth rate of 9%. The budget also increased from RWF 321 billion in FY 2010/11 to RWF 413 billion in FY 2015/16 (Ministry of Health, 2018).

Based on the WHO Global Health Observatory Data, Rwanda's per capita health expenditure has grown from US\$ 9 (in 2001) to US\$ 33.36 (in 2006) and to US\$ 40.37 per capita in 2009/10 (NHA, 2010). In 2015/2016, per capita health spending was estimated to US\$53 per capita. These per capita health expenditures remain lower than those suggested by the Commission on Macroeconomics and Health (US\$71 in 2012 prices), and the Taskforce on Innovative International Financing (US\$86 in 2012 prices) (Mcintyre and al., 2017). It is also lower US\$60 reported in the Rwanda Health Sector Strategic Plan IV.

²¹ Total health expenditure includes domestic resources from the government, external resources from donors and private expenditure from private sources (households and other private).

²² (a) USAID: Health insurance country profile (b) Rwanda health Financing policy (p. 11)

²³ The Rwanda HRTT was introduced in 2010 for routine tracking of finances throughout Rwanda's health system. HRTT aims to improve evidence-based decision-making, planning, and overall management performance. HRTT also aims at improving monitoring, transparency and accountability at all levels of the health sector. HRTT is used to collect comprehensive expenditure and budget data from all the levels of the public health sector as well as from development partners and international and local NGOs. Expenditures from health centers, private companies and clinics, and some civil society organizations and faith-based organizations had not yet been reported in the HRTT.

4.2.2. Overview of government, health and rehabilitation budgets

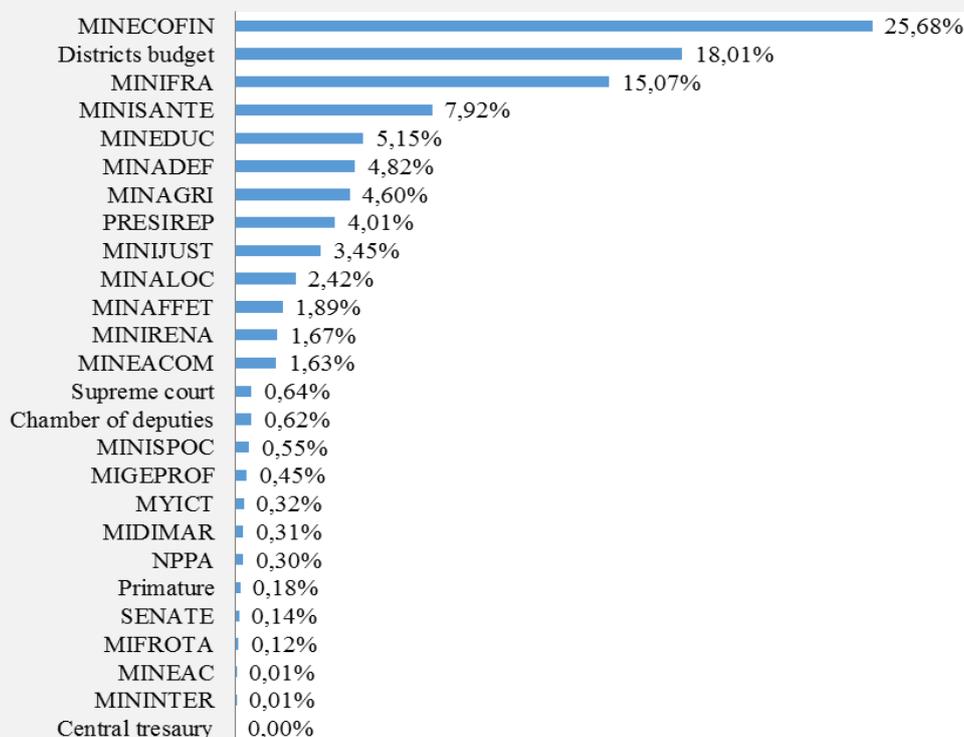
Government budget

The Government's budget for the fiscal year 2016/17 was 1,954 billion of RWF (\$2,326 million). The government of Rwanda is mainly financed by external resources as they represented 64% of the total budget for the fiscal year 2016/2017. Domestic resources mainly come from tax revenues (by 86%) and external resources come from grants (current grants and project grants) by 47% and proceeds from foreign borrowing by 53%. Programs budget are agreeing by the Ministry of Economic and Finance Planning (Minecofin).

The figure 36 describes the share of each Ministry's budget in the total government budget. The government budget is shared between 27 authorities where the Minecofin received 26% of the budget, then all districts received 18%, Ministry of Infrastructure (Minifra) received 15% and the Ministry of Health (Minisante) 8% of the government budget.

During the Abuja's agreement in 2001, governments committed to allocating at least 15% of their total annual government budgets to the health sector. In Rwanda, effort has to be done to reach this Abuja target and increase government commitment for the health sector in order to improve Rwandan health system and population health status.

Figure 36: Government budget, by Ministries and public bodies, fiscal year 2016-2017



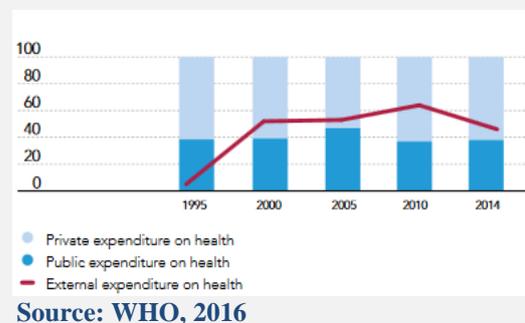
Source: Author, based on Minecofin data

Health sector budget

According to the Ministry of Health (Minisanté), there is a comprehensive financing framework in Rwanda for health systems building based on best practices in global health care financing (Ministry of Health 2015c). This statement is based on the two main channels that support this framework, “on the supply side with the implementation of fiscal decentralization with increased transfers from the central government to local governments, and peripheral health facilities based on needs and performance. And on the demand side with the establishment of a health insurance system that include cross-subsidies from richer to poor categories”.

The share of private expenditure (62%) is more important than public expenditure (38%) in the health sector, as a share of total health expenditure, in Rwanda in 2014. The proportion of private expenditure on health remains high over the past decades. The figure 37 reveals the lack of involvement of the government in the health sector.

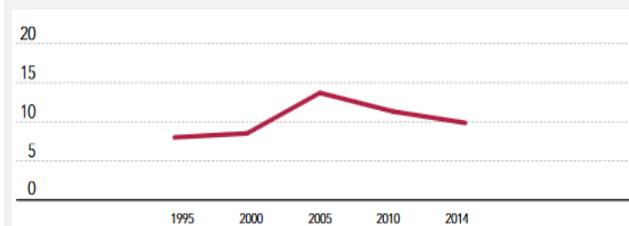
Figure 37: Public and private expenditure on health, and share externally funded (% total health expenditure), 1995-2014.



Source: WHO, 2016

According to WHO (WHO 2016b), public expenditures on health as a share of overall public expenditure (1995-2014) represented in the Figure 38 show that national effort have been done within the Millennium Development Goals (MDGs) dynamic to improve government investment on the health sector. However, since 2005, we observed a downward trend for public expenditure on health with a share of public health expenditure in total public expenditure of 10% in 2014. Rwanda belongs to the set of African countries that reduced their prioritization on health spending over the last decade.

Figure 38: Public expenditures on health as a share of total public expenditure 1995-2014



Source: WHO, 2016

At the 70th World Health Assembly in Geneva in May 2017, Dr Kieny listed 5 key takeaway points from discussion, including the recommendation that countries should aim for public financing of 5% of GDP for health in order to be able to achieve the universal health coverage by 2030 because “health is a right, no one should be leave behind, and all roads lead to UHC”

(WHO 2017d). In Rwanda, public health expenditure as a share of the GDP represents 2.9% in 2014 (World Bank). In 1995, the country was at 1.9%, so progress has been made, but there is still a lot to achieve to reach this 5% objective and more generally the universal health coverage target.

The need for the government is to increase the level of public budgets for health but also to appropriately target health budget allocations, complete the execution of health's public budgets, and improved efficiency in the use of public resources for health.

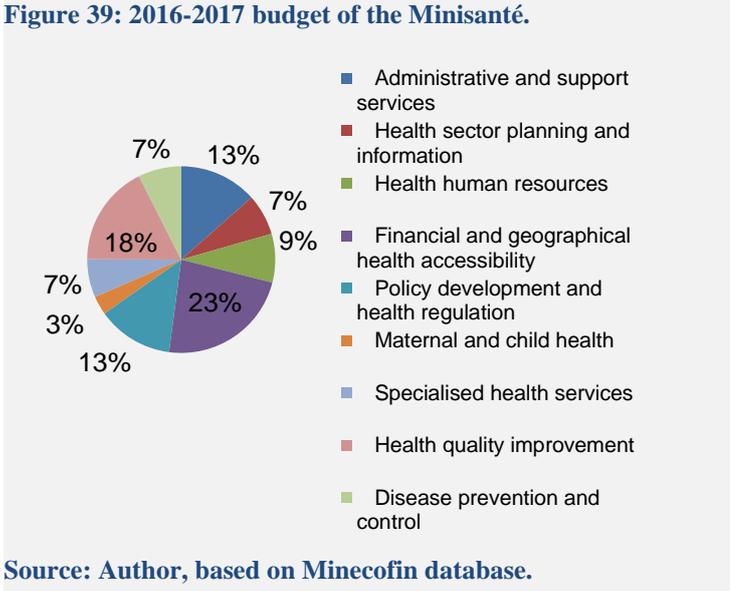
The national health budget for 2016/17 is 155 billion of RWF (\$184 million) and it represents 7.92% of the government budget. The budget of the Ministry of Health is financed by 73.5% by development budget (69% is domestic and 31% comes from external sources) and 24.5% by recurrent budget. The table 43 describes the budget of the Minisanté.

Table 43: Budget of the Minisanté, 2016-2017 (revised)

Budget line	2016/2017 Total Budget (million RWF)	2016/2017 Total Budget (million USD)	% total
Minisanté budget	154,900	185	
Administrative and support services	20,804	25	13,44%
Health sector planning and information	10,983	13	7,09%
Health human resources	13,071	16	8,44%
Financial and geographical health accessibility	35,787	43	23,11%
Insurance system organization	26,977	32	0,02%
Health services subsidization	5,589	7	3,61%
PBF	10,481	12	6,77%
Health infrastructure equipment and transport	19,690	23	12,72%
Policy development and health regulation	20,323	24	13,12%
Maternal and child health	5,037	6	3,25%
Specialized health services	10,233	12	6,61%
Health quality improvement	27,113	32	17,51%
Disease prevention and control	11,499	14	7,43%
HIV/AIDS, STIS and other blood borne diseases	1,973	2	1,27%
Malaria and other parasitic diseases	3,104	4	2,00%
Vaccine preventable diseases	3,164	4	2,04%
Epidemic infections, diseases	723	0.861	0,47%
NCDs	1,271	2	0,82%
TB and other respiratory CDs	701	0.834	0,45%
Mental health	562	669	0,36%

Source: Author, based on Minecofin data.

The Minisanté budget is divided in nine categories, (Figure 39), where “financial and geographical health accessibility” (23.1%) is the category that received the greater amount of money. This category contains “insurance system organization”, “health services subsidization”, “payment-based-performance” and “health infrastructure equipment and transport”. The second main category is “health quality and improvement” (17.5%), then “administrative and support service” (13.4%), “policy development and health regulation” (13.1%), “health human resources (8.4%), and Disease prevention and control (7.43%).



If we look at the budget by type of program and disease for the category “Disease prevention and control”, we observe that Malaria (27%), vaccine preventable (27.5%), and HIV/AIDS (17.2%) are the main source of interest of the government. However, in the Context section ([link](#)) we found that the main causes of disability-adjusted life year (DALY) in 2015 in Rwanda, according to the Global Burden of Disease study 2015 (Institute for Health Metrics and Evaluation 2017) is non-communicable diseases (NCDs) are the top ranking causes of disability. And, NCDs represents 11.05% of the disease prevention and control category, and 0.82% of the Minisanté budget which means that is a low priority for the government.

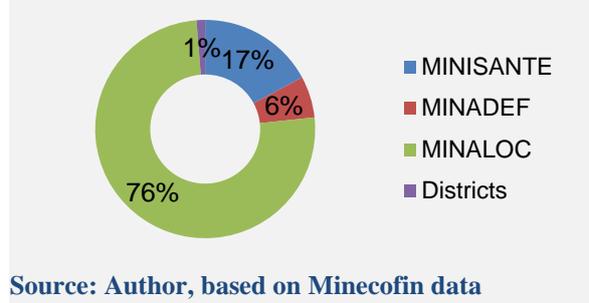
Rwanda developed an incentive scheme to improve the performance of its public health facilities; a performance-based-financing (PBF). Several pilots studies were initiated in 2002 then the country scaled up PBF to the all country and developed a national policy in 2005 (Meessen, Soucat, and Sekabaraga 2011). The government established direct linkages between finances, outputs and outcomes of these facilities. PBF is part of key pillars of Rwanda health financing (Ministry of Health 2015c). The Minisanté dedicated 6.77% of its budget to this PBF scheme.

Estimated rehabilitation budget

Rehabilitation and disability budget is mainly under the Ministry of local governance (Minaloc), the Ministry of Health (Minisanté) and the Ministry of Defense (Minadef). There is no specific budget allocated to disability and rehabilitation, and this group/program does not appear in the official budget of the Minecofin for the fiscal year 2016-2017. According to Minecofin, disability and rehabilitation budget cannot currently be represented as one budget line in this fiscal year budget as they considered it as a cross-cutting category. However, there has been no real reflection on disability and rehabilitation budget within the Minecofin and other ministries, and thus no initiatives on how to highlight it in the all government budget.

De facto, we tried to gather information from various official sources in order to assess the volume of the budget for rehabilitation and disability in Rwanda. We thus compiled various budget lines from the Minaloc, the Minisanté, districts budget, and the Minadef. We finally fund an estimated budget for rehabilitation and disability of around 5,552

Figure 40: Estimated rehabilitation budget by source of funding, 2016-2017



Source: Author, based on Minecofin data

million of RWF (\$6,6 million). As shown in Figure 40, the rehabilitation budget is estimated to be constituted of 75.44% from the Minaloc, 17.16% from the Minisanté, and 6.13% from the Minadef, and 1.27% for districts budget. This rehabilitation budget represents 0.28% of the total budget of the government. Table 42 described the details of this estimated rehabilitation budget.

Under the Ministry of Local Government (Minaloc), there are 5 sources of budget that represent in total 76% of the rehabilitation budget (4,259 million of RWF or \$5 million):

People with disabilities inclusion and advocacy: the Minaloc dedicated a budget for “people with disabilities’ inclusion and advocacy” of 332 million of RWF (\$395,651). It is detailed as mainstreaming inclusion of people with disabilities (80%) and persons with disabilities’ support (20%).

Sickness and disability: this thematic is under the social protection program of the Minaloc and represents 368 million of RWF (\$438,154). No detailed of this budget was available when we wrote this report.

Support funds to genocide survivors (FARG): This fund, under the Minaloc, provides funds to provide assistance to survivors of the 1994 genocide. To estimate the part dedicated to rehabilitation and disability we used a sub-budget line “social benefit” that represents 798 million of RWF (\$949,179).

National commission for demobilization: this commission is under the Minaloc, and as for the FARG, we used the sub budget line “social benefit” to estimate the rehabilitation and disability budget of this organism that is 2,665 million RWF (\$3 million).

National Council for people with disabilities (NCPD):

Social benefit: as for FARG and the National Commission for demobilization we used the sub-budget line social benefit which is 26 million RWF (\$30,358).

Under the **Ministry of Health (Minisanté):** there are health facilities which have rehabilitation services, and the Rwandan Biomedical Center (RBC). The budget of the Ministry of Health for rehabilitation represents 17.16% of the rehabilitation budget or 953 million of RWF (\$1,133,682).

Health facilities: CHUK and Central University Hospital of Butare received direct funding from the Minisanté. The share of rehabilitation budget in their total budget is estimated to be respectively around 10% and 9.1%, the budget of Minisanté facilities is thus 741 million of RWF (\$881,636). We estimated this budget by taking the ratio of the number of rehabilitation services on the total number of services in the facility; we then apply this percentage to their total budget.

Rwandan Biomedical Center: the RBC is divided into two departments, the Biomedical Services Department and the Institute for HIV/AIDS, Diseases prevention and Control Department (IHDPC). Within the IHDPC, there are 7 divisions including one dedicated to non-communicable diseases (NCDs). Inside this NCDs division there is the unit “injuries and disabilities”. To estimate the amount of its budget, we divided the NCDs division’s budget into 6 (corresponds to the number of units in the Division) that represents 212 million of RWF (\$252,047).

Under **Districts budget:**

At district level, there is a specific **support for persons with disabilities** (additional budget of the NCPD) which is under the subline “Social protection” of each district. This budget

represents around 2.5 million RWF for each district, even if two of them had 2.7 and 2.75 million RWF. In addition, 28 districts out of 30 have a line dedicated to the support for persons with disabilities which represents 70 million of RWF (\$83,836) for all districts in Rwanda. Ruhango (lower prevalence rate of disability), and Ngororero districts do not devoted money to the support for persons with disabilities. For the others districts, this budget is shared between “use of goods and services” (80%), and “grants” (20%).

Under the Ministry of Defense (Minadef):

Rwanda Military Hospital (RMH): we used the same methodology for Minisanté health facilities to estimate the share of rehabilitation services in the total budget of the RMH. We obtained a rehabilitation budget for the Minadef of 340,537,415 RWF (\$405,240). The Minadef thus counts for 6.13% of the total estimated rehabilitation budget. The figure 44 shows the share of each type of the rehabilitation budget for 2016/2017. The more important contributions come from the facilities and the National Commission for demobilization that represent 73% of the total budget.

Table 44: Estimated rehabilitation and disability budget in Rwanda, FY 2016-2017

	Estimated rehabilitation budget, 2016-2017		Share in the total budget, 2016-2017
	Million RWF	USD	%
MINISANTE budget	953	1,133,683	17,16%
Rehab services in Health facilities	741	881,636	13,34%
RBC - disability and injury unit	212	252,047	3,81%
MINADEF budget	341	405,240	6,13%
Rwanda military hospital	341	405,240	6,13%
MINALOC budget	4,259	5,068,101	76,71%
PWDs inclusion and advocacy	332	395,651	5,99%
Sickness and disability	368	438,154	6,63%
NCPD (Social benefit)	26	30,358	0,46%
NCPD (PWDs support in Districts level)	70	83,836	1,27%
FARG	798	949,179	14,37%
National commission for demobilization	2665	3,170,924	47,99%
Districts budget	70	83,836	1,27%
PWDs support	70	83,836	1,27%
Total	5,552	6,607,023	

Source: Author, based on Minecofin data.

Rehabilitation scheme financing in Rwanda may be summarized in four points.

Firstly, this part highlighted that a demand exist for rehabilitation services, but it is not satisfied by the human resources supply that remains insufficient.

Secondly, we observed that there is an upward trend in total health budgets and spending. Rwanda's per capita health expenditure has grown from US\$ 9 to US\$ 33.36 from 2001 to 2006 and to US\$ 40.37 per capita in 2009/10. Moreover, government of Rwanda is mainly financed by external resources. Domestic resources mainly come from tax revenues and external resources come mainly from grants (current grants and project grants). Additionally, the share of the health budget in the total government budget is 8%, thus effort has to be done to reach the Abuja target and increase government commitment for the health sector in order to improve Rwandan health system and population health status. The share of private expenditure is more important than public expenditure in the health sector in Rwanda and the proportion of private expenditure on health remains high over the past decades. Since 2005, there is a downward trend for public expenditure on health; Rwanda belongs to the set of African countries that reduced their prioritization on health spending over the last decade.

Another point is that there is an issue of health prioritization in the country as non-communicable disease is the main causes of disability-adjusted life year (DALY) but the disease prevention and control category received a very little small amount of the Minisanté budget.

Finally, there is no specific budget allocated to disability and rehabilitation, and there has been no real reflection on disability and rehabilitation budget within the Minecofin and other ministries, and thus no initiatives on how to highlight it in the all government budget. We fund an estimated budget for rehabilitation and disability of around 5,552 million of RWF (\$6,6 million).

5. Estimation of the cost of a rehabilitation service

Spending on rehabilitation services was largely difficult to determine because it generally is not disaggregated from other healthcare expenditure. As we mentioned “limitations” under the methodology section, the research team faced difficulties to obtain financial data about expenses and budget of the 12 facilities that we visited. The 4 disability-focused centers we interviewed share their financial information namely Inkurunziza orthopedic – hospital (Gikondo), Rilima orthopedic center, HVP Gatagara (Nyanza), CRF Gahini. We also obtained financial budget of a primary level private community rehabilitation center (Gahanga) that receive children with disabilities.

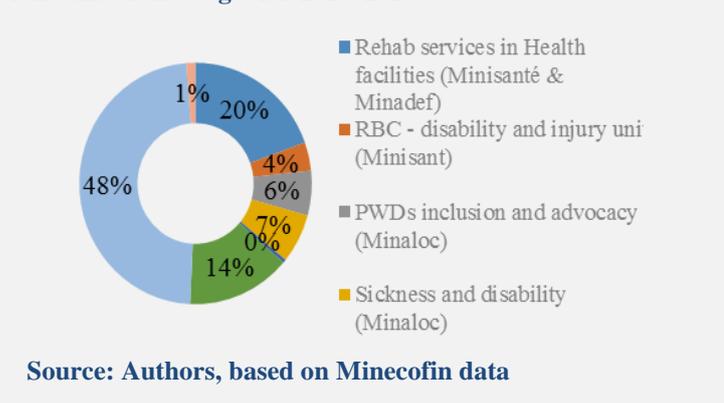
However, HVP Gatagara and Rilima centers have been classified in the category “A” for the assessment of their technical level for physiotherapy, prosthetics and orthotics services. But physiotherapy services of Masaka hospital has been assessed as “C” category, it means that it does not have enough equipment (in quantity or in quality) to provide satisfying service to its patients. Therefore, the budget of physiotherapy service for Masaka cannot be taken into consideration as it is not enough to provide quality of care to patients attending the rehabilitation services.

The Figure 41 presents details on the total budget for 2017 of considered facilities. In our estimation we took into account 8 categories of costs:

Staff costs: include salaries, incentives for the staff, and all other costs related to human resources such as benefits (e.g. health insurance), training, exchange visits, conferences, uniforms and safety clothing.

Production materials, devices and other clinical supplies: refers to all local and imported raw materials for production, as well as tools for production, devices used in workshops (e.g. Wheelchairs), and consumables used in treatment, medicines, and physiotherapy equipment.

Figure 41: Distribution of financial sources of the estimated rehabilitation budget for 2016-2017



Food, transport and accommodation for patients: take into account all costs related to food or food allowances provided to patients and/or their caregivers, kitchen and dormitory supplies for patients, transport allowances paid to patients and/or caregivers.

Utilities: include costs related to electricity, water, and garbage collection.

Building rental and premises maintenance: it covers all repairs and maintenance costs related to buildings, property and assets.

Outreach & community: it is about advertising, travel costs for outreach and community programs.

Vehicles and Transport: all vehicles and it includes rental, maintenance, insurance, fuel, other local travel.

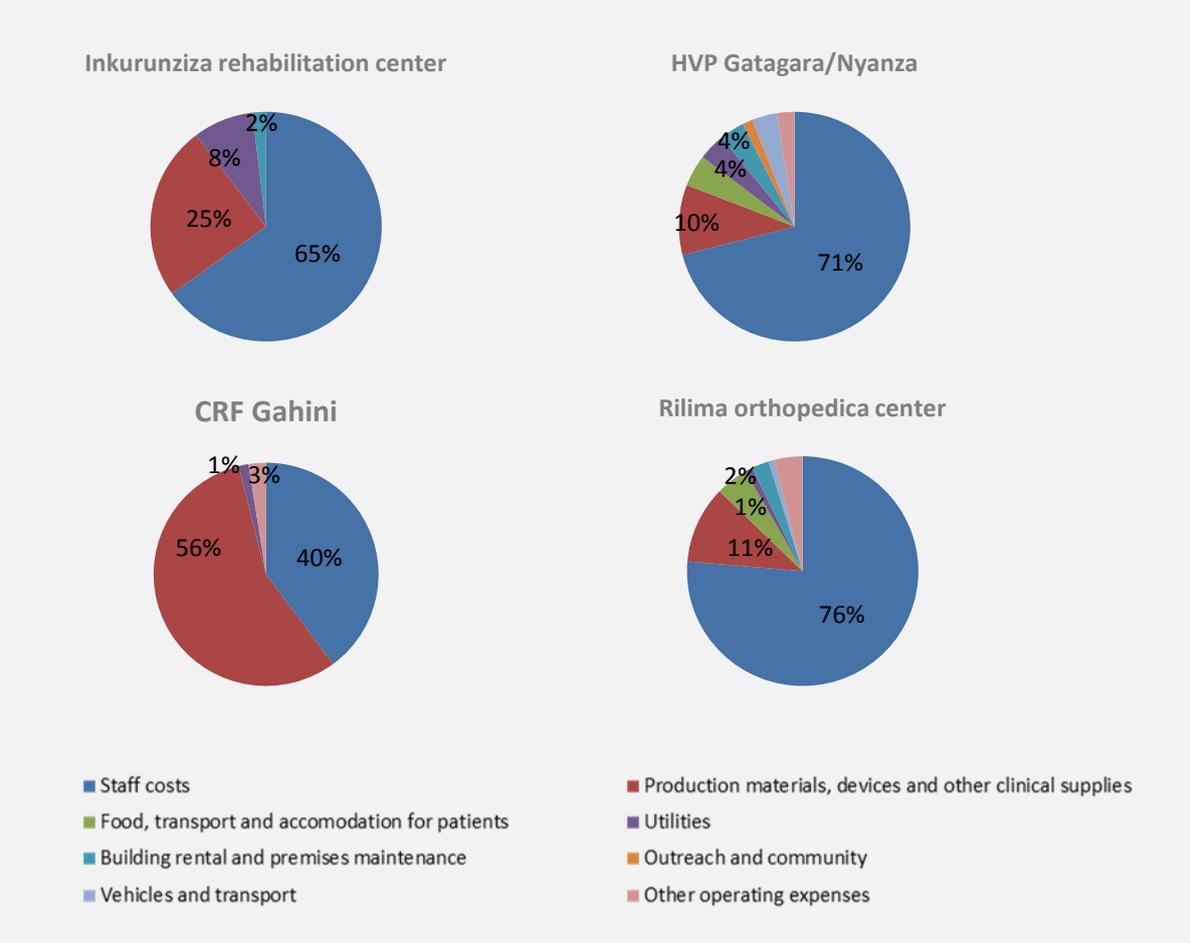
Other operating expenses include office expenses and supplies such stationery, computer and office equipment (items <\$2,000), equipment rental, print, postage, phone, internet, cleaning, insurance, other services.

Drivers of costs in rehabilitation facilities and centers

Staff salaries are major cost drivers in the rehabilitation facilities and centers. The second driver of cost was associated with “production materials, assistive devices and other clinic supplies”. This cost category represented 56% of the budget in Gahini, and 25% in Inkurunziza rehabilitation centers.

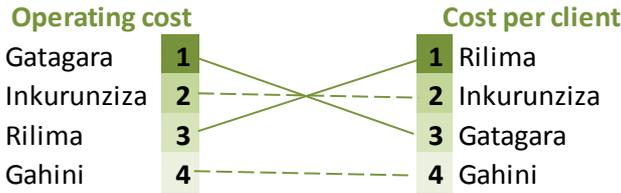
The average operating budget of disability-focused centers is around 526,641,374 RWF (605,638 USD), see Figure 42. The analysis revealed an unequal distribution of financial resources across selected centers. HVP Gatagara has the higher operating cost (827,734,783 RWF or 951,895 USD), Inkurunziza and Rilima have closes operating expenditures (225,5 million RWF – 259 thousand USD), and Gahini has the lowest cost (113,541,466 RWF or 130,573 USD).

Figure 42: Distribution of expenses across rehabilitation centers studied, 2017



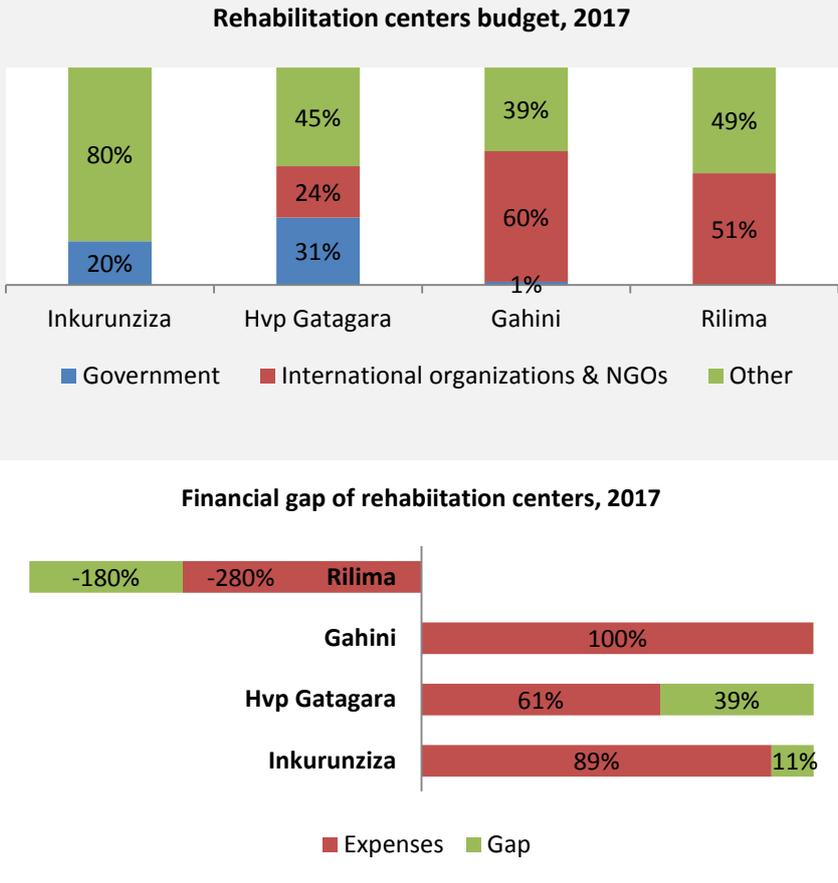
Source: Author.

When looking at the operating cost per patient for rehabilitation service in these centres, Rilima has the higher cost per patient of 398,291 RWF (458 USD), then Inkurunziza with 227,367 RWF (261 USD), followed by Gatagara with a cost per patient of 185,966 RWF (214 USD) and the cost of patient of Gahini is 44,807 RWF (52 USD). We assume that Rilima center may have some efficient issues when we compare these data to Inkurunziza or Gatagara centers. But a deeper study should analyze the determinants of this high cost per patient for Rilima.



The study of budgets data of these 4 rehabilitation centers (Figure 43) revealed that the government contributed on average to 13% of their budget, international non-governmental organizations by 34%, and the 53% left come from various private sources. When operating cost of these rehabilitation centers are compared to their total budget for 2017, we observed a more or less important gap. According to data collected, Rilima rehabilitation center has a total budget in 2017 of 89 million RWF and a total investment and operating expenditures of 249.3 million RWF. There is thus a gap of 160.2 million RW, it represented -179% of the total budget. Inkurunziza seems to have made a more spare use of its budget with a gap of 11% (26 million RWF or 30 995 USD). Gatagara has an important surplus of 39% of its budget (531 million RWF or 611 271 USD). Deeper analysis is also required to understand this unspent budget.

Figure 43: Finance of rehabilitation centers studied, 2017.



Source: Author.

6. Estimation of the cost charged to the patient in comparison with the level of catastrophic health expenditures

6.1. Estimation of catastrophic health expenditure in Rwanda

We assessed the level of catastrophic health expenditures to compare with the cost charged to the patient (see next section). Health expenditures are considered to be catastrophic when a person spends more than 40% of their capacity-to-pay (or household non-subsistence income, i.e. income available after basic needs have been met) from out-of-pocket payments. The threshold of 40% may be adapted according to a country's specific situation but it allows comparisons between countries, according to WHO methodology (Xu and al. 2007). The capacity-to-pay is expressed as the total consumption cost per capita per year minus the national poverty line.

As explained in the previous chapter ([link](#)), we are aware of the debate surrounding the choice of catastrophic health expenditures. That is the reason why, in the next section, we included the costs of transport and accommodation in the total cost of rehabilitation treatment when we compared this result to the level of catastrophic health expenditures. Nevertheless, the opportunity cost has not been taken into account for reasons of simplifications, even if we recommended including it for more representativeness of the reality faces by patient.

This study used the national poverty line per capita as defined according to the EICV4 and the poverty trend analysis report 2010/2011-2013/2014. We used the total consumption per capita and per year as based on information collected by the fifth integrated household living conditions survey (EICV5) undertaken between October 2016 and October 2017 (NISR 2018).

The table 45 describes profile of poverty by looking at the trends in poverty between 2010/11 and 2016/17. According to the EICV 5 of 2016/17, the main poverty line is set at RWF 159,375 per adult equivalent per year in the prices of January 2014. This is the same poverty line that was used to measure poverty in 2014 using the EICV4 data, and a detailed discussion of how the line was chosen may be found in the EICV4 Poverty Profile report. In the EICV, no distinction has been made related to a potential different level of consumption between different socioeconomic status of households surveyed.

Table 45: Trends in poverty headcount rates in Rwanda, 2010-2017

	2010/11 (EICV3)	2013/14 (EICV4)	2016/17 (EICV 5)
Poverty rates (Nationally)	46.0	39.1	38.2
Urban	17.7	15.9	15.8
Rural	51.0	43.7	43.1
Extreme poverty (Nationally)	21.8	16.3	16.0
Urban	10.4	5.4	5.9
Rural	26.4	18.5	18.1

Source: National Institute of Statistics of Rwanda: EICV 3, EICV 4 & EICV 5

During this time, the poverty rate – which measures the proportion of people whose expenditure per adult equivalent falls below the total poverty line – fell from 46.0% in 2010/11 to 39.1% in 2013/14 and 38.2% in 2016/17 nationally (Table 43). Extreme poverty fell from 21.8% in 2010/11 to 16.3% and 16.0% the population between 2013/14 and 2016/17 respectively.²⁴

The table 46 shows calculations of the level of catastrophic health expenditure in Rwanda. We estimated that health expenditures are catastrophic if they are equal or above 47,850 RWF (\$55.03) in Rwanda, 164,250 RWF (\$188.89) in urban areas and, 23,050 RWF (\$26.51) in rural areas.

Table 46: Estimation of catastrophic health expenditures in Rwanda

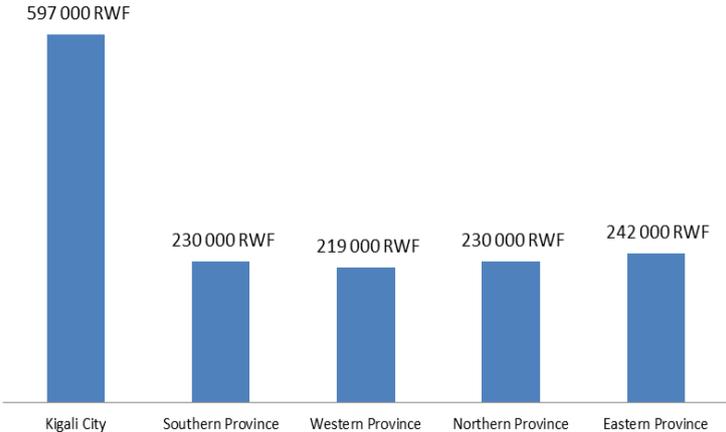
Indicators per adult	Rwanda	Urban areas	Rural areas
Per capita spending on food per year	110 005,61 RWF	224 742,63 RWF	85 559,92 RWF
Total consumption per capita / month	23 250,00 RWF	47 500,00 RWF	18 083,33 RWF
Total consumption per capita / year	279 000,00 RWF	570 000,00 RWF	217 000,00 RWF
Monetary poverty threshold expressed per adult / year	159 375,00 RWF	159 375,00 RWF	159 375,00 RWF
Capacity to pay per capita	119 625,00 RWF	410 625,00 RWF	57 625,00 RWF
Catastrophic health expenditure > (Ability to pay * 40%)	47 850,00 RWF	164 250,00 RWF	23 050,00 RWF
Catastrophic health expenditure USD	\$ 55,03	\$ 188,89	\$ 26,51

Source: Author, based on Poverty trend analysis report 2010/11, 2013/14, 2016/17 (NISR 2018)

²⁴ The percentage of the total population living below the poverty line fell to 46% in 2010/11 to 39.10% in 2013/14 (NISR 2016). The recent EICV report shows a slight decline of poverty headcount at 38.2 in 2016/17 (NISR 2018).

These variations of the level of catastrophic health expenditures are due to the gap of income between urban and rural areas and more particularly the high gap between Kigali city and other provinces. The average annual consumption per adult (equivalent in January 2014 prices) was 597,000 RWF in Kigali city while the average in the four other provinces was around 230,500 RWF (Figure 44). People living in the capital province are wealthier than those living in other provinces.

Figure 44: Average annual consumption per adult equivalent in January 2014 prices, by province, 2011-17



Source: Author based on NISR 2018 data.

6.2. Costs from patients’ perspective: the use of rehabilitation services

6.2.1. Cost related to the use of physiotherapy services: cost charged to patient

We estimated the cost charged to the patient according to the methodology described above. Table 47 summarizes tariffs for a one-year treatment for low back pain, clubfoot, and cerebral palsy, according to each type of official tariff, and to the localization and technical level of the service.

Table 47: Cost charged to the patient for physiotherapy services, Rwf, 2016

Condition	Tariff*	Nearest PT Service		Higher level of PT Service	
		Total cost excluding stay	Total cost including stay	Total cost excluding stay	Total cost including stay
Low back pain (35 sessions)	A	84,598RWF	164,947 RWF	102,058RWF	165,446RWF
	B	119,024RWF	240,673 RWF	136,484RWF	241,172RWF
	C	124,324RWF	252,325 RWF	141,784RWF	252,824RWF
	D	134,324RWF	274,208 RWF	151,784RWF	274,707RWF
	E	149,526RWF	307,680 RWF	166,986RWF	308,179RWF
Clubfoot (16 sessions)	A	38,823 RWF	76,454RWF	46,804RWF	76,953RWF
	B	54,724RWF	111,235RWF	62,705RWF	111,734RWF
	C	57,174RWF	116,589RWF	65,155RWF	117,088RWF
	D	61,790RWF	126,638RWF	69,772RWF	127,137RWF
	E	68,836RWF	142,035RWF	76,817RWF	142,534RWF
Cerebral palsy (52 sessions)	A	125,555RWF	244,623 RWF	151,495RWF	244,623RWF
	B	176,556RWF	356,485RWF	202,496RWF	356,984RWF
	C	184,406RWF	373,773RWF	210,346RWF	374,272RWF
	D	199,222RWF	406,244RWF	225,163RWF	406,743RWF
	E	221,724RWF	455,889RWF	247,664RWF	456,388RWF

*Tariffs: A (CBHI, mutuelle de santé), B (MMI, MIS/UR, Mutuelles d'université et instituts supérieurs), C (RAMA), D (iNGO, Diplomat and private), E (Without health coverage).

In blue: cost below the national level of catastrophic health expenditure

In green: cost below the level of catastrophic health expenditure in urban areas

In black: cost that is always a catastrophic health expenditure, independently of the considered level.

Source: Author, based on the MoH official tariff lists

Figure 45 gives an illustration of the costs for physiotherapy in comparison to the level of catastrophic health expenditure (CHE) in urban areas and in Rwanda. All cost of treatment for physiotherapy represents catastrophic health expenditure for patients living in rural areas.

For low back pain condition, the cost of treatment is always above national and rural levels of health expenditures. Compared to the urban level of CHE, this condition is not a financial risk for the household if the patient is not staying at the facility or if he stays but he benefits from a *mutuelle*.

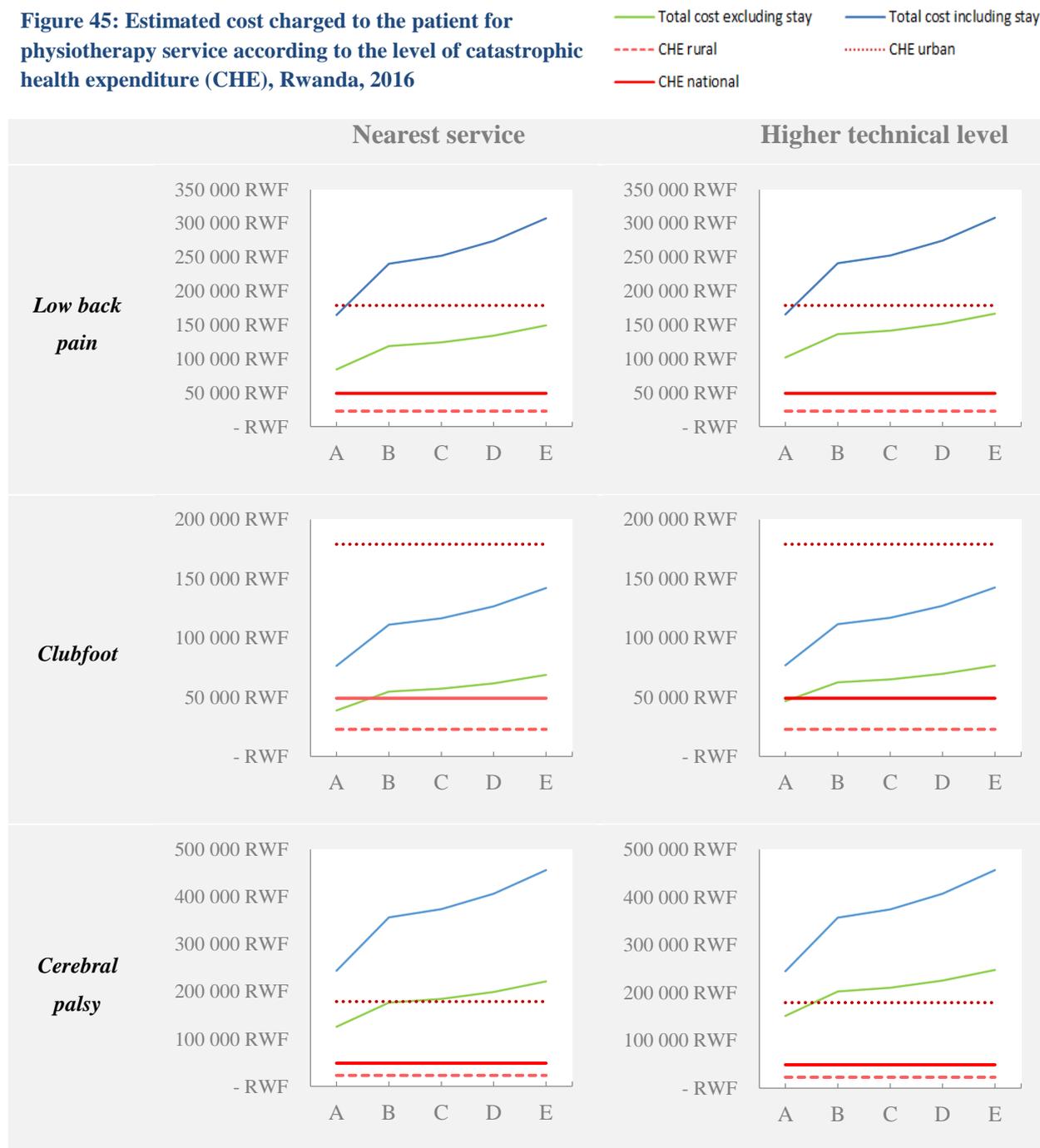
For clubfoot, only patients who are not staying at the center/hospital and who benefit from a *mutuelle* will have health expenditure that will not occur in catastrophic health expenditure (at national level of CHE). For other tariffs and for patients who stay at the hospital/center, the

cost of care is estimated to be below the urban poverty line, but above the national and rural lines. It means that only patients living in urban area will not have catastrophic health expenditure.

For patients with cerebral palsy who have been treated in the nearest service, who live in urban areas, benefit from the *mutuelle* or MMI, and who are not staying at the hospital/center will not have catastrophic health expenditure because of rehabilitation care. For all the other, treatment for cerebral palsy is heavy and expensive and may push them in a dramatic financial situation.

On average, a patient will have more expenditure if he is not hospitalized either at a hospital or a health center. Similarly, if the patient wants to or has to pursue his treatment at a higher level of service (e.g. provincial and referral hospitals), generally far from his home, the cost of care can be so high in relation to income. This will lead to a greater risk of catastrophic health expenditure for the individual or the household. Such high expenditure can mean that people of disabilities will have to cut down on necessities such as food and clothing, or are unable to pay for their children's education.

Figure 45: Estimated cost charged to the patient for physiotherapy service according to the level of catastrophic health expenditure (CHE), Rwanda, 2016



*CHE: Rwanda= 49 179,20 RWF, Urban= 179 050,00 RWF, and Rural= 23 050,00 RWF.

Tariffs: A (CBHI, mutuelle de santé), B (MMI, MMI, Mutuelles d'université et instituts supérieurs), C (RAMA), D (iNGO, Diplomat and private), E (Without health coverage).

* Low back pain : 35 sessions, Clubfoot : 16 sessions, and Cerebral palsy : 52 sessions.

Source: Author.

We also estimated the gap between costs charged to the patient for a specific device and the level of catastrophic health expenditure in urban areas and in Rwanda (see Appendix). This gap represents the missing amount of money of the household to avoid catastrophic health expenditure when they seek for treatment.

For the thoracic-brachial orthosis (upper limb orthosis), the cost charged to the patient is greater than national and urban CHE by respectively 40% to 84%.

For, traced KAFO with drop lock knee joint and ankle joints imported (lower limb orthosis). The gap between the cost charged to the patient and CHE is from 86% to 92%. Aesthetic prosthetic arm/trans humeral in polypropylene (upper limb prosthesis) has a gap between the final cost due to the patient and CHE between 5% and 88%.

For endoskeletal femoral prosthesis in polypropylene (lower limb prosthesis), the patient has to pay around 89% more than the level of catastrophic health expenditure in both levels.

As for wheelchairs (walking aid), the gap goes from 91% to 86% at the expense of the patient. Only the considered device for upper limb prosthesis presents a reasonable cost that will not push the patient into extreme poverty in urban areas and for the nearest service from patient's home.

We observed that for all conditions (low back pain, clubfoot, and cerebral palsy), all type of social coverage (tariffs from A to E), and regardless of the distance from the service, physiotherapy always represented a catastrophic health expenditure (CHE) for the household in urban area in comparison to the level of CHE in rural areas (~23,050Rwf). Social coverage through Mutuelle/CBHI appears to be the current best protection against financial risk for physiotherapy treatment, even if it is not enough for most of the patients, and for all conditions.

6.2.2. Costs related to the use of P&O service

Similarly, to physiotherapy service, we estimated the costs charged to the patient for the main devices used: Thoracic-brachial orthosis (upper limb orthosis), Traced KAFO with drop lock knee joint and ankle joints imported (lower limb orthosis), Aesthetic prosthetic arm / trans humeral in polypropylene (upper limb prosthesis), Endoskeletal femoral prosthesis in polypropylene (lower limb prosthesis) and wheelchair (walking aid). The table 48 summarizes tariffs for each device, according to the type of official tariff, and to the localization and technical level of the service.

Table 48: Cost charged to the patient for P&O service, RWF, 2016

Devices	Tariffs	Nearest P&O Service		Higher level of P&O Service	
		Total cost excluding stay	Total cost including stay	Total cost excluding stay	Total cost including stay
Upper limb prosthesis	A	222 437 RWF	231 593 RWF	223 989 RWF	231 981 RWF
	B	304 569 RWF	318 445 RWF	306 121 RWF	318 833 RWF
	C	330 303 RWF	344 905 RWF	331 855 RWF	345 293 RWF
	D	363 864 RWF	379 824 RWF	365 415 RWF	380 212 RWF
	E	306 593 RWF	324 641 RWF	308 144 RWF	325 028 RWF
Lower limb prosthesis	A	468 640 RWF	477 796 RWF	470 192 RWF	478 184 RWF
	B	644 330 RWF	658 206 RWF	645 882 RWF	658 594 RWF
	C	699 608 RWF	714 210 RWF	701 160 RWF	714 598 RWF
	D	771 576 RWF	787 536 RWF	773 127 RWF	787 924 RWF
	E	647 338 RWF	665 386 RWF	648 889 RWF	665 774 RWF
Upper limb orthosis	A	38 940 RWF	48 096 RWF	40 492 RWF	48 484 RWF
	B	51 344 RWF	65 220 RWF	52 896 RWF	65 608 RWF
	C	55 058 RWF	69 660 RWF	56 610 RWF	70 048 RWF
	D	59 993 RWF	75 953 RWF	61 544 RWF	76 341 RWF
	E	52 633 RWF	70 681 RWF	54 185 RWF	71 069 RWF
Lower limb orthosis	A	329 556 RWF	338 712 RWF	331 108 RWF	339 100 RWF
	B	452 394 RWF	466 270 RWF	453 946 RWF	466 658 RWF
	C	490 982 RWF	505 584 RWF	492 534 RWF	505 972 RWF
	D	541 253 RWF	557 213 RWF	542 804 RWF	557 601 RWF
	E	454 846 RWF	472 894 RWF	456 397 RWF	473 281 RWF
Wheelchair	A	255 341 RWF	260 998 RWF	256 117 RWF	261 386 RWF
	B	351 617 RWF	359 634 RWF	352 393 RWF	360 022 RWF
	C	381 817 RWF	390 197 RWF	382 593 RWF	390 585 RWF
	D	421 184 RWF	430 243 RWF	421 959 RWF	430 631 RWF
	E	353 789 RWF	363 892 RWF	354 565 RWF	364 280 RWF

*Tariffs: A (CBHI, mutuelle de santé), B (MMI, MMI, Mutuelles d'université et instituts supérieurs), C (RAMA), D (iNGO, Diplomat and private), E (Averagetariff)

In blue: cost below the national level of catastrophic health expenditure

In green: cost below the level of catastrophic health expenditure in urban areas

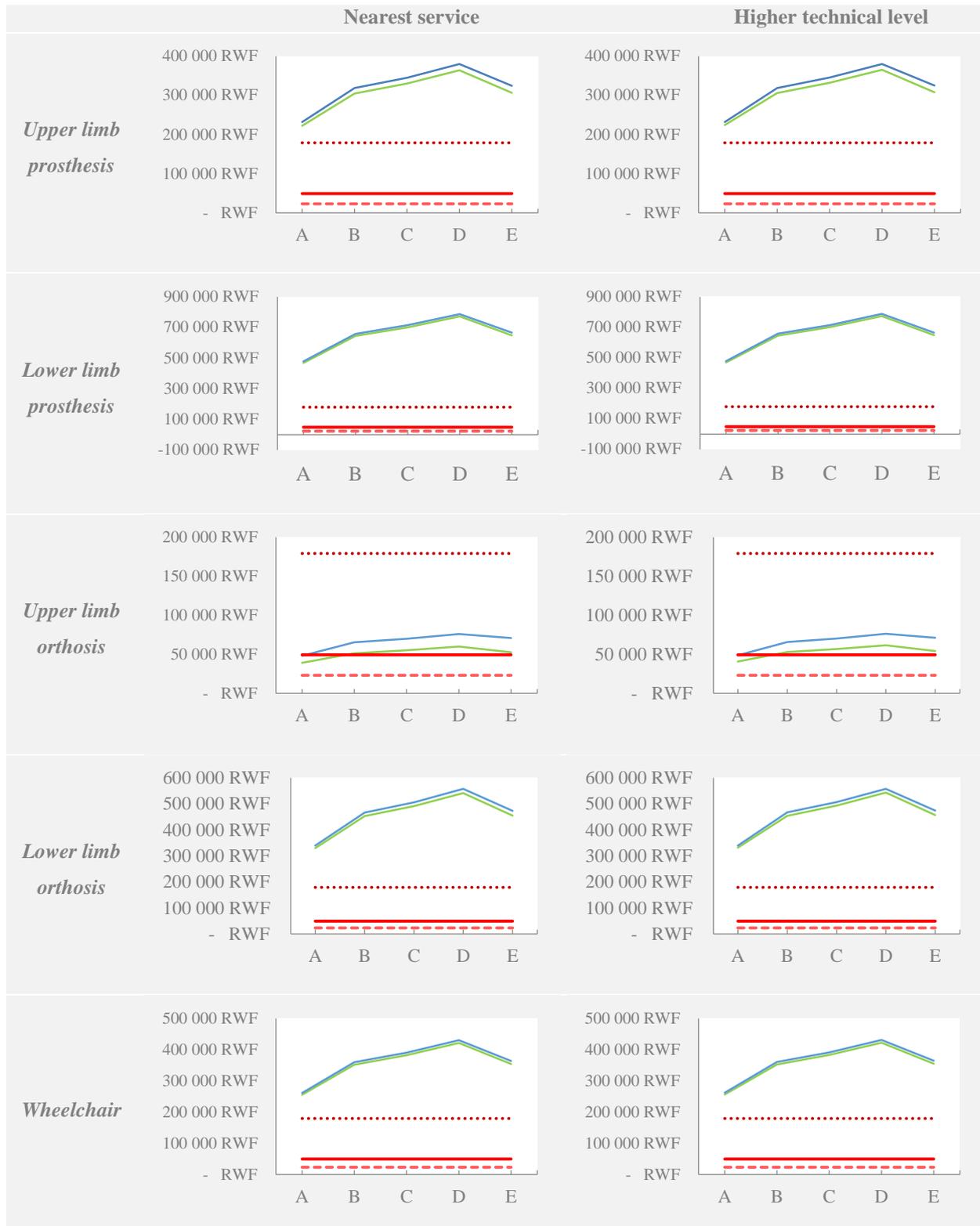
In black: cost that is always a catastrophic health expenditure, independently of the considered level.

Source: Author, calculations are based on the MoH official tariff lists

The figure 46 above, presents the estimated cost charged to the patient for P&O services for each type of considered device, compared to the three levels of catastrophic health expenditure (CHE), and according to the 4 modalities chosen (cost including or excluding stay, nearest service and higher technical level of service).

Figure 46: Estimated cost charged to the patient for P&O services according to the level of catastrophic health expenditure (CHE), Rwanda, 2016

— Total cost excluding stay — Total cost including stay
- - - CHE rural ⋯ CHE urban
— CHE national



*CHE: Rwanda= 47,850 RWF, Urban= 164,250 RWF, and Rural= 23 050 RWF. *Tariffs : A (CBHI, mutuelle de santé), B (MMI, MMI, Mutuelles d'université et instituts supérieurs), C (RAMA), D (iNGO, Diplomat and private), E (Averagetariff)

Source: Author.

We observed the following points:

- For prosthesis, upper or lower limb, the cost of care including or excluding stay and in the nearest hospital or in a higher technical level service, and regardless of the social protection scheme, the cost is always above the three levels of catastrophic health expenditures. This device represents a high financial risk for Rwandan households.
- Upper limb orthotic: the cost of care to obtain this device is cheaper than others as its cost is below the urban level of CHE for all modalities. But this orthotic is a CHE for all rural population. For people living in a place where the standard of living is between urban and rural amounts, this device is a CHE if the patient does not have a *mutuelle*.
- Lower limb orthotic: for the 4 modalities, the cost charged to the patient to obtain this device is always above the three levels of CHE and it is thus a high risk of impoverishment for households.
- Wheelchair: as for lower limb orthosis, the cost of wheelchair is very expensive and represents catastrophic health expenditure for all estimated levels.

We also estimated the gap between the cost charged to the patient for a specific device and the level of catastrophic health expenditure in urban areas in Rwanda (see Appendix). This gap represents the missing amount of money of the household to avoid catastrophic health expenditure when he seeks for treatment.

For the thoracic-brachial orthosis (upper limb orthosis), the cost charged to the patient is greater than national and urban CHE by respectively 40% to 84%.

For traced KAFO with drop lock knee joint and ankle joints imported (lower limb orthosis), the gap between the cost charged to the patient and CHE is from 86% to 92%. Aesthetic prosthetic arm/trans humeral in polypropylene (upper limb prosthesis) has a gap between the final cost due to the patient and CHE between 5% and 88%.

For endoskeletal femoral prosthesis in polypropylene (lower limb prosthesis), the patient has to pay around 89% more than the level of catastrophic health expenditure in both levels.

For wheelchairs (walking aid) the gap goes from 91% to 86% at the expense of the patient. Only the considered device for upper limb prosthesis presents a reasonable cost that will not push the patient into extreme poverty in urban areas and for the nearest service from patient's home.

Prosthetics and Orthotics (P&O) services are very expensive for the Rwandan population. Most of devices represent catastrophic health expenditure (CHE) for all levels considered, national, rural and urban. These estimations reveal that people with disabilities have to urge the government to take into consideration these facts and act to prevent households from financial risk due to P&O devices, and more generally for rehabilitation care. Social protection mechanisms are not enough to protect rehabilitation patients from extreme poverty, and persons with disabilities have a “double penalty” as they belong to the poorest population and they have basic and specific health care needs due to their condition.

7. Investing in the rehabilitation sector in Rwanda

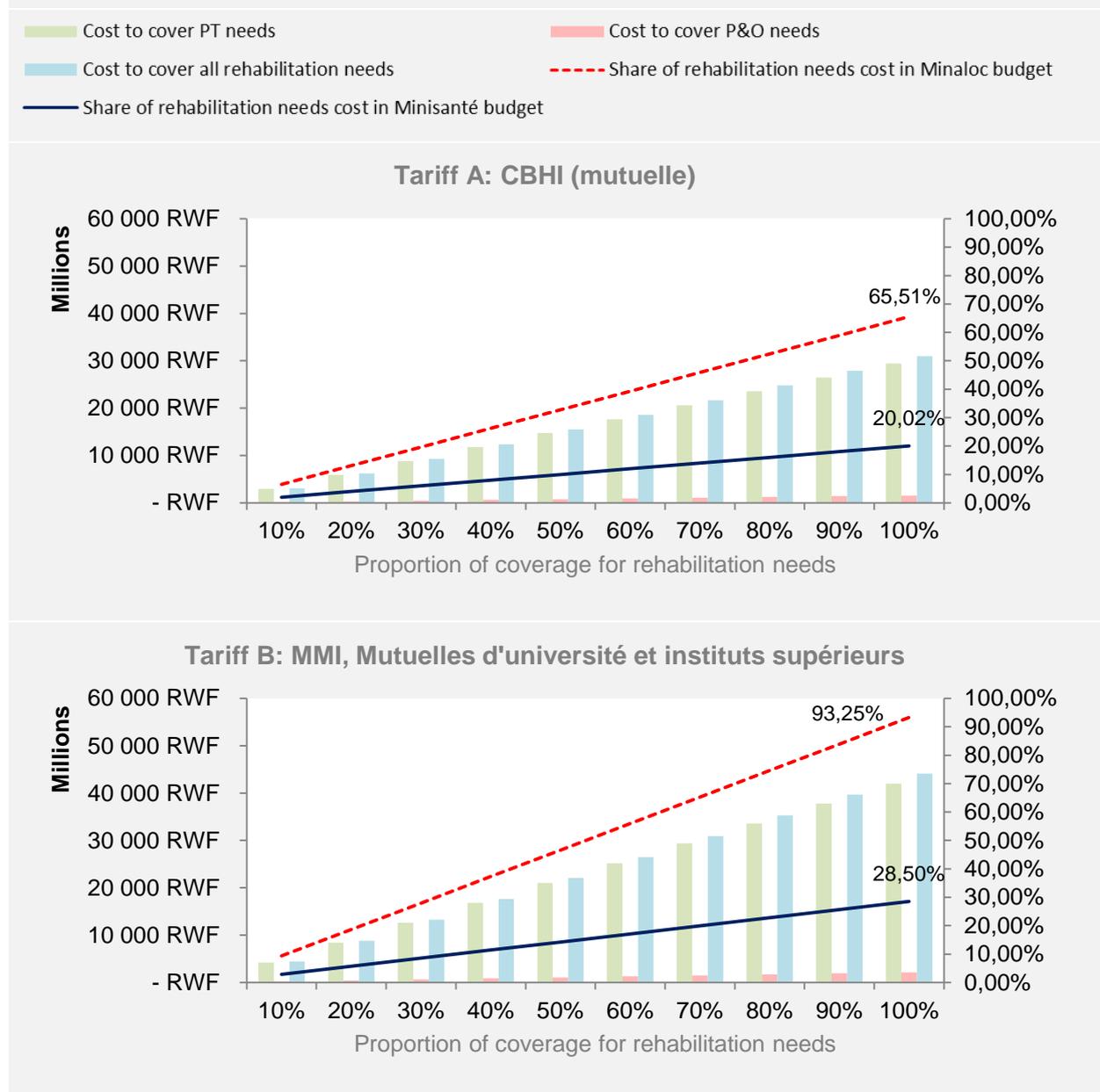
This section aims to estimate potential economic gains as the result of relevant expenses in the rehabilitation sector and the inclusion of persons with disabilities in the labor market. We assume that if persons with disabilities have a better access to rehabilitation care and are not anymore left out of the health system because of financial constraints, they will be in better health and able to be integrated in the formal sector and have a regular income. As mentioned in the introduction, persons with disabilities have a higher risk to live behind the poverty line in comparison to persons without disability because of their condition. This is the reason why investing in the rehabilitation sector will enable these persons to break out of this vicious circle of disability and poverty. Integration of persons with disabilities in the formal sector will make possible increase of tax revenue for the government. Therefore, investing in rehabilitation is a high opportunity for the government to reduce unemployment of persons with disabilities through the development of financial access to high quality rehabilitation services for the population and tax revenues. In this section, we will first estimate the expenses required to cover rehabilitation needs in Rwanda, then we will focused of the estimation of economic gains for the government due to rehabilitation expenses.

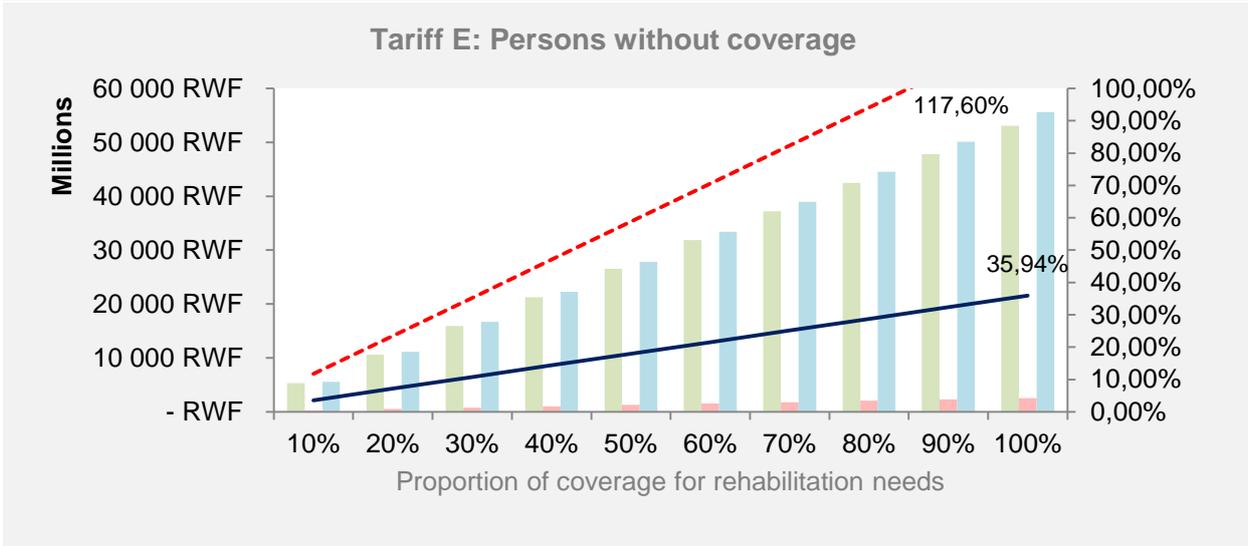
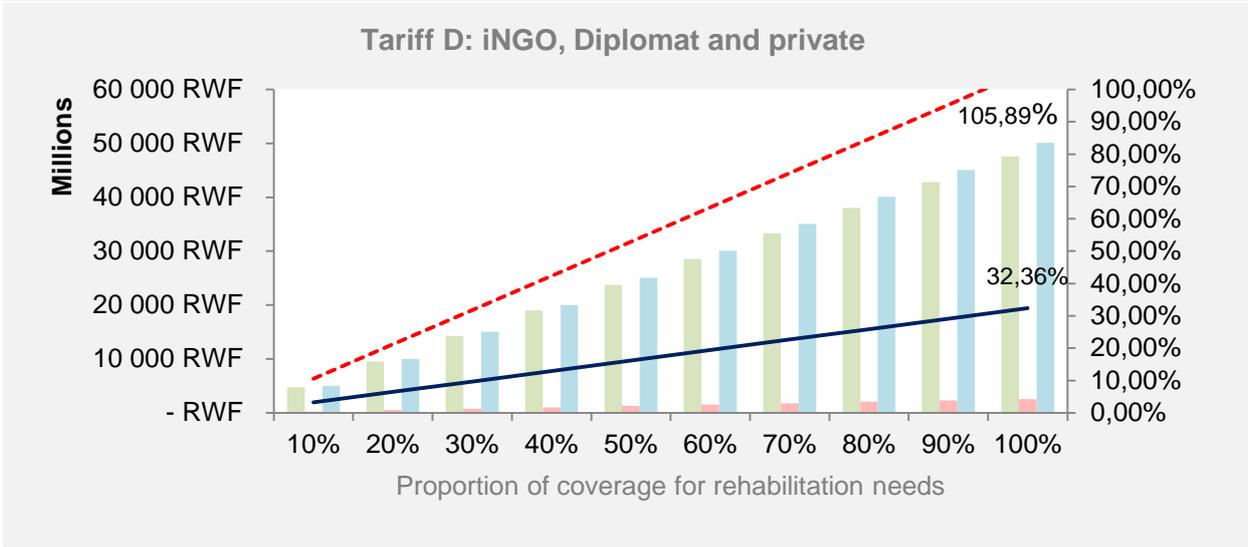
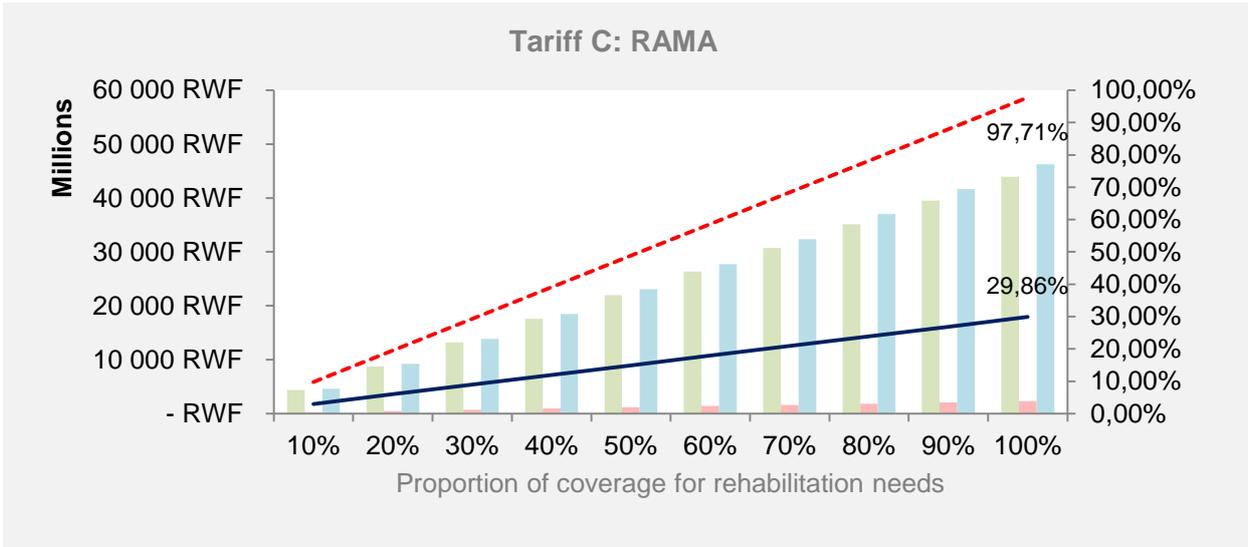
7.1. Estimation of the expenses required to cover rehabilitation needs

7.1.1. Estimation of rehabilitation needs for persons with disabilities

We estimated expenses required to cover all rehabilitation needs for persons with disabilities in Rwanda (Figure 47), based on the average tariffs, the number of persons with disabilities and those who need P&O and physiotherapy. We also compared these estimated costs with government budgets.

Figure 47: Scenarios to cover rehabilitation needs (cost of care and cost of transport and accommodation) according to the tariff payed by beneficiaries, 2017





Source: Author.

The annual cost to cover all rehabilitation needs (costs of care, transport and accommodation) for patients who need rehabilitation treatment varies from 31 billion of RWF to 56 billion of RWF or it varies from 20% (CBHI-*mutuelle* tariff) to 36% (cost for no social security scheme) as a share of the Ministry of Health budget for a given year, and from 66% to 118% as a share of the Ministry of Local Governance budget. For instance, for patients who benefit from the community-based health insurance (CBHI-*mutuelle*), the remaining cost for the government is estimated at 31 billion of RWF or 20% of the Ministry of Health budget and 66% of the Ministry of Local Governance budget, if all rehabilitation needs of the population are covered.

If rehabilitation services (at least P&O and physiotherapy) will be integrated into the CBHI-*mutuelle*, the government will have to disburse 31 billion of RWF to cover the cost of all rehabilitation needs for a given year. If the government increases by 20% the budget of the Ministry of Health, it will allow this Ministry to dedicate this budget to the coverage of rehabilitation needs for CBHI members.

7.1.2. Estimation of expenses required at health center's level

During the field mission, a recurrent issue was raised about the congestion of physiotherapy services and, we analyzed that this is mostly due to poor patient referrals and a lack of services. Most of them thought that a solution to ease the congestion was to create in each health center a physiotherapy unit with basic equipment and one physiotherapist. This is the reason why we estimated how much it will cost to the government to open a small physiotherapy unit at health centers' level. We used the estimated operating cost of a physiotherapy service, and we included the salary of a A1 physiotherapist. Table 49 and Figure 48 summarize the results.

Based on these estimations around 4,7 billion RWF are required to open a basic physiotherapy service at health center's level and for all health centers in Rwanda. It represents an expense of 0.24% in the government budget, 3.03% in the Ministry of Health budget, 9.90% in the Ministry of Local Governance budget and 84.39% in the rehabilitation budget.

Table 49: Scenarios to implement physiotherapy unit at health center’s level

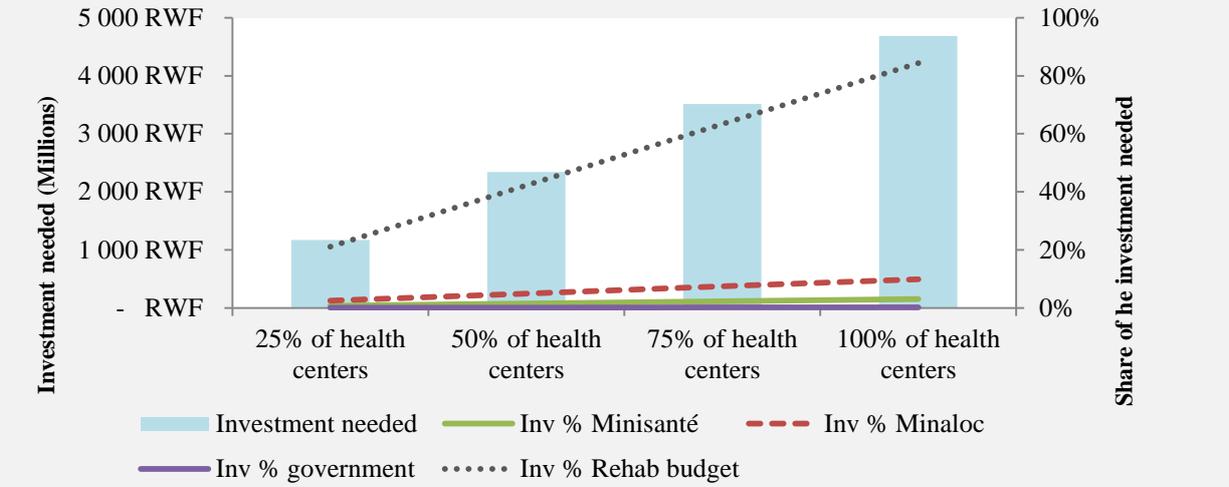
Scenarios	Expenses needed (millions of RWF)	Expenses needed (USD)	Inv % government	Inv % Ministry of Local Governance	Inv % Ministry of Health	Inv % Rehab budget
Expenses needed to provide 1 PT in 25% of health centers	1,171	1.4	0,06%	2,48%	0,76%	21,10%
Expenses needed to provide 1 PT in 50% of health centers	2,343	2.8	0,12%	4,95%	1,51%	42,19%
Expenses needed to provide 1 PT in 75% of health centers	3,514	4.2	0,18%	7,43%	2,27%	63,29%
Expenses needed to provide 1 PT in 100% of health centers	4,685	5.6	0,24%	9,90%	3,03%	84,39%

PT: physiotherapist

Source: Author.

We recommend to the government of Rwanda to implement a basic physiotherapy service in all health centers, as it may help to relieve the congestion in health services for public hospitals. Additionally, it should reduce transportation and accommodation fees for some patients who require long-term and regular sessions of physiotherapy. Figure 48 suggests an implementation process with a gradual opening of physiotherapy services in health centers. During the initial pilot phase an expenses of 1,1 billion RWF (represents 25% of health centers) is expected, then 2,3 billion RWF (represents 50% of health centers), 3,5 billion RWF (represents 75% of health centers), and then a national scaling-up to 100% of health centers for 4,7 billion RWF.

Figure 48: Share of expenses needed in government, Ministry of Local Governance, Ministry of Health and rehabilitation budgets to open a physiotherapy service at health center's level, FY 2016-17.



Source: Author.

7.2. Estimation of economic gains for the government due to rehabilitation expenses

7.2.1. Labor market for people with disabilities in Rwanda

According to the 4th Household Living Conditions Survey (EICV4) (Ministry of Finance and Economic Planning and National Institute of Statistics of Rwanda 2014); the current employed rate for persons with disabilities is around 52.3%, while for persons without a disability it is around 71%. It thus represents 276,891 (47.7%) of persons with disabilities without a job and without the opportunity to earn a regular salary. These figures are probably underestimated compared to the current situation in the country. The average annual salary in Rwanda is around 266,362RWF (\$316.97), Table 50 summarizes incomes data in Rwanda.

Table 50: Employment and incomes in the labor market in Rwanda

	Rate		Value
Currently employed persons with disabilities	52,30%	303 593 persons	
Unemployment rate for persons with disabilities	47,70%	276 891 persons	
Unemployment rate for persons without disabilities	25,00%		
Average income in Rwanda			
Average daily wage (2011 prices)	<i>Daily (RWF)</i>	<i>Annually (RWF)</i>	<i>Annually (USD)</i>
farm workers	247 RWF	59 280 RWF	\$ 70,54
no farm workers	520 RWF	124 800 RWF	\$ 148,51
industry sector	750 RWF	180 000 RWF	\$ 214,20
	<i>Daily (RWF)</i>	<i>Annually (RWF)</i>	<i>Annually (USD)</i>
Permanent employees	52 092 RWF	625 104 RWF	\$ 743,87
Non-permanent employees	28 552 RWF	342 624 RWF	\$ 407,72
	<i>Average</i>	16 432 RWF	266 362 RWF
			\$ 316,97

*pwds: persons with disabilities

Source: Author based on the 2nd and 4th Household living conditions surveys.

Furthermore, the labor force rate participation, as estimated by the 4th Rwanda population and housing census for resident population aged 16 or older, shows that regardless of the age, the labor force participation rate is always higher for persons without disabilities. Persons with disabilities faced unequal access to the labor market due to their condition, and indirectly to their exclusion from social participation (e.g. education).

The estimated number of persons living below the national poverty line and being considered as poor is 4,539,379 (39.1% of the population), and the number of people who are considered as extremely poor is 1,892,376 (16.3%) (NISR 2015).

7.2.2. Estimation of the economic gains for the government

To estimate if there is a potential return on expenses for the government we estimated the economic gains due to the financial coverage of rehabilitation services for persons with disabilities, according to several scenarios (please refer to the [methodology section](#) for more information regarding economic gains' approaches). The main assumption made here is that some persons with disabilities will find a job as a result of their access to rehabilitation care and it will contribute to the increase of the productivity gains.

Defined scenarios are based on a number of different situations potentially faced by persons with disabilities, as described below:

- Access to care with full treatment:
 - 100% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
 - 75% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
 - 50% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
 - 25% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
 - 10% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
 - 5% of persons with disabilities accessed to rehabilitation care and completed their all treatment.
- Employment rate (Ministry of Finance and Economic Planning and National Institute of Statistics of Rwanda 2014):
 - The employment rate of persons with disabilities will remain at the same current level (52.30%)
 - The employment rate of persons with disabilities will reach the same level of the employment rate of the population (71.00%).
 - The employment rate of persons with disabilities will increase (61.65%, the average between employment rate of persons with disabilities and employment rate of the population).
- Salary of persons with disabilities (Ministry of Finance and Economic Planning and National Institute of Statistics of Rwanda 2014):
 - Low salary based on the average salaries of farm and industry workers and non-farm workers from the informal sector: 121,360 RWF.
 - Medium salary based on the average salaries of low and high salaries: 302,612 RWF.
 - High salary based on the average salaries of permanent and non-permanent employees from the formal sector: 483,864 RWF.
- Hours of work:

- The percentage of persons working part-time or short hours (lower than 35 hours per week) was 52% measured in terms of usual hours worked in the general population at all jobs (NISR 2017). We assume that 52% persons with disabilities will work part-time or 75% of persons with disabilities will work part-time. We suppose that all persons with disabilities will not be able to work full time after receiving their treatment and that this rate may be higher than in the general population.

We thus estimate the economic gains through the evaluation of the gathered revenue of the 18% value-added tax (VAT) on an average annual level for consumption in Rwanda and the annual tax band revenue. In Rwanda, the annual tax band revenue represents 20% of annual salaries between 360,000 and 1,200,000 RWF and 30% of annual salaries over 1,200,000 RWF. For salaries below 360,000 RWF, no deduction is made. The table 51 summarizes the results of calculations, according to the several scenarios.

The first scenario represents the ideal and utopian scenario where all persons with disabilities will have access to care and complete their treatment. All of these persons will find a job, there is no unemployment, associated with a high salary and they will work full time in their new job. Thus, the economic gains associated to this scenario are estimated at 121,115 million RWF. According to the budget of the government, this economic gain represents around 6.20% of the government budget and 78.21% of the Minisanté budget.

A medium scenario such as the scenario number 28 presents the case of 75% of persons with disabilities have access to care and complete their treatment. 61.5% of these persons will find a job and 38.35% will remained unemployed. These persons will obtain a medium salary and 52% of them will work part-time. The economic gain of this scenario is around 54 969 million RWF. According to the budget of the government, this economic gain represents around 2.81% of the government budget and 35.50% of the Minisanté budget.

The annual return on expenses for the government varies from 1,236 million RWF in the more pessimistic scenario to 121,115 million RWF in the more optimistic one and represents from 0.06% to 6.20% of its total budget and from 2.61% to 78.21% of the Ministry of Health budget, regarding the scenario considered.

Table 51: Estimations of the economic gains of covering rehabilitation care for all people with disabilities, million RWF.

Scenarios	% of pwds accessed to rehab care & completed their treatment	Employment rate	A annual salary (million RWF)	A: Annual tax band revenue (million RWF)	Total consumption of household per year (million RWF)	B : 18% VAT (million RWF)	Prime gains = A+B (million RWF)	% Pwds working part-time	Economic gains (million RWF)	
1	100%	Full	100,00% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	0%	121 115 RWF
2	100%	High	71,00% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	75%	90 836 RWF
3	100%	High	71,00% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	52%	62 980 RWF
4	100%	High	71,00% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	75%	73 293 RWF
5	100%	High	71,00% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	52%	50 816 RWF
6	100%	High	71,00% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	75%	35 652 RWF
7	100%	High	71,00% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	52%	24 719 RWF
8	100%	Medium	61,65% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	75%	90 836 RWF
9	100%	Medium	61,65% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	52%	62 980 RWF
10	100%	Medium	61,65% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	75%	73 293 RWF
11	100%	Medium	61,65% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	52%	50 816 RWF
12	100%	Medium	61,65% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	75%	35 652 RWF
13	100%	Medium	61,65% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	52%	24 719 RWF
14	100%	Low	52,30% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	75%	90 836 RWF
15	100%	Low	52,30% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	121 115 RWF	52%	62 980 RWF
16	100%	Low	52,30% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	75%	73 293 RWF
17	100%	Low	52,30% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	97 723 RWF	52%	50 816 RWF
18	100%	Low	52,30% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	75%	35 652 RWF
19	100%	Low	52,30% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	47 536 RWF	52%	24 719 RWF
20	75%	High	71,00% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	75%	68 127 RWF
21	75%	High	71,00% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	52%	47 235 RWF
22	75%	High	71,00% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	75%	54 969 RWF
23	75%	High	71,00% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	52%	38 112 RWF
24	75%	High	71,00% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	75%	26 739 RWF
25	75%	High	71,00% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	52%	18 539 RWF
26	75%	Medium	61,65% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	75%	68 127 RWF
27	75%	Medium	61,65% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	52%	47 235 RWF
28	75%	Medium	61,65% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	75%	54 969 RWF
29	75%	Medium	61,65% Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	52%	38 112 RWF
30	75%	Medium	61,65% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	75%	26 739 RWF
31	75%	Medium	61,65% Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	52%	18 539 RWF
32	75%	Low	52,30% High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	75%	68 127 RWF

Scenarios	% of pwds accessed to rehab care & completed their treatment	Employment rate	A annual salary (million RWF)	A:	Annual tax band revenue (million RWF)	Total consumption of household per year (million RWF)	B :	18% VAT (million RWF)	Prime gains = A+B (million RWF)	% Pwds working part-time	Economic gains (million RWF)
33	75%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	90 836 RWF	52%	47 235 RWF
34	75%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	75%	54 969 RWF
35	75%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	73 293 RWF	52%	38 112 RWF
36	75%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	75%	26 739 RWF
37	75%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	35 652 RWF	52%	18 539 RWF
38	50%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	75%	45 418 RWF
39	50%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	52%	31 490 RWF
40	50%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	75%	36 646 RWF
41	50%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	52%	25 408 RWF
42	50%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	75%	17 826 RWF
43	50%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	52%	12 359 RWF
44	50%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	75%	45 418 RWF
45	50%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	52%	31 490 RWF
46	50%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	75%	36 646 RWF
47	50%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	52%	25 408 RWF
48	50%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	75%	17 826 RWF
49	50%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	52%	12 359 RWF
50	50%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	75%	45 418 RWF
51	50%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	60 557 RWF	52%	31 490 RWF
52	50%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	75%	36 646 RWF
53	50%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	48 862 RWF	52%	25 408 RWF
54	50%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	75%	17 826 RWF
55	50%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	23 768 RWF	52%	12 359 RWF
56	25%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	75%	22 709 RWF
57	25%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	52%	15 745 RWF
58	25%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	75%	18 323 RWF
59	25%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	52%	12 704 RWF
60	25%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	75%	8 913 RWF
61	25%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	52%	6 180 RWF
62	25%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	75%	22 709 RWF
63	25%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	52%	15 745 RWF
64	25%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	75%	18 323 RWF
65	25%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	52%	12 704 RWF

Scenarios	% of pwds accessed to rehab care & completed their treatment	Employment rate	A annual salary (million RWF)	A: Annual tax band revenue (million RWF)	Total consumption of household per year (million RWF)	B : 18% VAT (million RWF)	Prime gains = A+B (million RWF)	% Pwds working part-time	Economic gains (million RWF)		
66	25%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	75%	8 913 RWF
67	25%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	52%	6 180 RWF
68	25%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	75%	22 709 RWF
69	25%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	30 279 RWF	52%	15 745 RWF
70	25%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	75%	18 323 RWF
71	25%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	24 431 RWF	52%	12 704 RWF
72	25%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	75%	8 913 RWF
73	25%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	11 884 RWF	52%	6 180 RWF
74	10%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	75%	9 084 RWF
75	10%	High	71,00%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	52%	6 298 RWF
76	10%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	75%	7 329 RWF
77	10%	High	71,00%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	52%	5 082 RWF
78	10%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	75%	3 565 RWF
79	10%	High	71,00%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	52%	2 472 RWF
80	10%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	75%	9 084 RWF
81	10%	Medium	61,65%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	52%	6 298 RWF
82	10%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	75%	7 329 RWF
83	10%	Medium	61,65%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	52%	5 082 RWF
84	10%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	75%	3 565 RWF
85	10%	Medium	61,65%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	52%	2 472 RWF
86	10%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	75%	9 084 RWF
87	10%	Low	52,30%	High	133 977 RWF	107 182 RWF	77 406 RWF	13 933 RWF	12 111 RWF	52%	6 298 RWF
88	10%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	75%	7 329 RWF
89	10%	Low	52,30%	Medium	83 790 RWF	83 790 RWF	77 406 RWF	13 933 RWF	9 772 RWF	52%	5 082 RWF
90	10%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	75%	3 565 RWF
91	10%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	4 754 RWF	52%	2 472 RWF
92	5%	Low	52,30%	Low	33 603 RWF	33 603 RWF	77 406 RWF	13 933 RWF	2 377 RWF	52%	1 236 RWF

Pwds: persons with disabilities; VAT: value-added tax

Source: Author.

To estimate the return on expenses we assumed a 5 years plan where the government will have to make initial expenses in year 0, and collect each year the return of its expenses. This projection revealed a total return on expenses for 5 years for the above selected optimistic, medium and pessimistic scenarios, according to the tariff for patients who benefit from the CBHI/*mutuelle* (31,001 million RWF), of around:

- Scenario 1: 453,458 million RWF or 23.20% of the government budget.
- Scenario 10: 262,169 million RWF or 13.42% of the government budget.
- Scenario 28: 188,876 million RWF or 9.66% of the government budget.
- Scenario 46: 115,584 million RWF or 5.91% of the government budget.
- Scenario 64: 42,291 million RWF or 2.16% of the government budget.
- Scenario 82: -1,684 million RWF or -0.09% of the government budget.
- Scenario 92: -26,057 million RWF or -1.33% of the government budget.

With an initial expense of 31 billion RWF the government has a positive return of expenses from scenarios 1 to 46 (50% of persons with disabilities found a job), or from 36 billion RWF to 121 billion RWF. Furthermore, this economic gain for the government is under estimated as we only take into account the potential tax collected from active persons with disabilities. We assume that the return on expenses should be higher as people who become include in the society conducts to a sequence of macroeconomic impacts. According to The World Bank, costs associated with including people with disabilities are far outweighed by the long term financial benefits to individuals, families, and society (World Bank 2007). Therefore, there is a large, macroeconomic cost of excluding people with disabilities from the national workforce.

8. Conclusion

The present chapter investigated the rehabilitation sector in Rwanda in terms of economic and financial flows. Through this objective, we studied the Rwandan physical and functional rehabilitation sector and we looked at several elements, namely: a) the provision of rehabilitation services within the health system; b) the financial burden of rehabilitation services for patients; and c) the required expenses in the rehabilitation sector to cover unmet needs.

Overview of health and rehabilitation system

Regarding the provision of rehabilitation services within the health system, we find that the rehabilitation sector contains physiotherapy, occupational therapy, and prosthetics and orthotics services. There are 52 physiotherapy services (without private services), and 12 prosthetics and orthotics services, which are not enough to cover the need of the population in term of quantity of services and human resources and in quality of services provided. Overall, there is a gap of rehabilitation professionals as there is no speech therapists and no official training exist for occupational therapists, and the gap of physiotherapists is estimated to be around 828 workers. Prosthetists and Orthotists (P&O) of the category I do not exist in the country, only Prosthetists and Orthotists of category II and technicians work in Rwanda. 52 P&O categories I or II should be implemented at district centers, 11 at provincial center, and 9 at national centers, according to population needs. It is recommended to develop P&O services at this level to facilitate referencing to the upper level, provincial, and then to the national level. Furthermore, as no specific budget is allocated to disability and rehabilitation, we estimated it and we found 5,552 million RWF (\$7 million) for the fiscal year 2016-2017. Rehabilitation budget mainly came from the Ministry of Health, and it represents 0.28% of the total budget of the government. We also estimated the average operating budget for a disability focused center by 472 million RWF (\$561,947). Thus the average operating cost per patient is 304,464 RWF (\$362).

Rehabilitation needs and current coverage

Regarding the financial burden of rehabilitation care for persons with disabilities, we find that there is around 580,483 persons with disabilities in Rwanda with an estimated number of persons who need rehabilitation care of 232,193 persons, and around 58,048 persons required prosthesis or orthosis, according to international standards references. Whereas each physiotherapy service should annually provide a service to around 4,656 persons to satisfy population needs, current average in Rwanda is 848 patients for a physiotherapy service. For prosthetics and orthotics, a Rwandan service is annually providing devices for 703 patients while it is recommended to provide devices to 4, 837 patients per year. Therefore, there is a large part of rehabilitation needs that remains unmet. Concerning social security for rehabilitation services, there are some common elements between existing mechanisms. Main

strengths highlighted are the cover of all primary health care services in the public system and sometimes in the private non-for profit facilities, the inclusion of physiotherapy services in the package of care financially covered. While main weaknesses raised are the coverage of mainly the formal and public sector, other persons are generally left out of these benefits, prosthesis and orthosis are rarely covered, except in the medical scheme of RSSB while there are very expensive devices with a high risk of impoverishment for patients. Therefore, no current social security mechanism include a comprehensive financial coverage of rehabilitation care, particularly for prosthetics and orthotics, the most expensive care for persons with disabilities.

Cost charged to rehabilitation's patients and their risk of impoverishment

De facto, we estimated the cost charged to patients for rehabilitation services for one year, in comparison to the level of catastrophic health expenditures in rural and urban areas. Health expenditure are considered to be catastrophic if they are equal or above 49,179 RWF (\$58.52), equal or above 179,050 RWF (\$213.07) in urban areas and equal or above 23,050 RWF (\$27.43) in rural areas. For all conditions (low back pain, clubfoot, and cerebral palsy), all type of social coverage physiotherapy always represents a catastrophic health expenditure (CHE) for the household in comparison to the level of CHE in rural areas (~23,050Rwf). The unit cost of physiotherapy per patients varies from 126,823 RWF to 228,688 Rwf, according to the type of social protection mechanism. Most of devices represent catastrophic health expenditure for all levels considered, national, rural and urban. The unit cost for patients varies from 267,657 RWF to 439,310 RWF. These estimations reveal that persons with disabilities have to urge the government to take into consideration these facts and act to prevent households from financial risk due to prosthetics and orthotics devices, and more generally for rehabilitation care. Social protection mechanisms are not enough in Rwanda to protect rehabilitation patients from extreme poverty, and persons with disabilities have a “double penalty” as they belong to the poorest population and they have basic and specific health care needs due to their condition.

Economic gains for the government due to rehabilitation expenses

Finally, we estimated the economic gains for the government due to rehabilitation expenses. We defined economic gains as the result of relevant expenses in the rehabilitation sector, and thus the inclusion of people with disabilities in the labor market. Based on previous results, we evaluated the annual cost to cover all rehabilitation needs (cost of care and costs of transport and accommodation) for patients who need rehabilitation treatment varies from 31 billion RWF to 55,6 billion RWF or it varies from 20% (CBHI tariff) to 36% (cost for no health coverage) as a share of the Ministry of Health budget for a given year, and from 66% to 118% as a share of the Ministry of Local Governance budget. If rehabilitation services, at least prosthetics and orthotics, and physiotherapy, will be integrated into the CBHI-*mutuelle*, the government will have to disburse 31 billion of RWF to cover the cost of all needs for a given year. If the government increases by 20% the budget of the Ministry of Health, it will allow this Ministry to dedicate this budget to the coverage of rehabilitation needs for CBHI members. We also evaluated the expenses required at health center's level and we find that 4,7 billion of RWF are necessary to open a basic physiotherapy service in all health centers (investment expenditures on the first year, and operating expenditures in the following years). It represents expenses of 0.24% in the government budget, 3.03% in the Ministry of Health budget, 9.90% in the Ministry of Local Governance budget and 84.39% in the rehabilitation budget.

We estimated the economic gains due to the financial coverage of rehabilitation services for persons with disabilities, according to several scenarios. The main assumption made is that some persons with disabilities will find a job as a result of their access to rehabilitation care and it will contribute to the increase of the productivity gains. Defined scenarios are based on a number of different situations potentially faced by persons with disabilities in terms of access to care with full treatment, employment rate, salary, and hours of work. The annual return on expenses for the government varies from 1,236 million RWF in the more pessimistic scenario to 121,115 million RWF in the more optimistic one and represents from 0.06% to 6.20% of its total budget and from 2.61% to 78.21% of the Ministry of Health budget, regarding the scenario considered. Based on a 5 years plan, the potential return on expenses for the government on this period greatly varies according to the scenario: scenario 1: 453,458 million RWF or 23.20% of the government budget, scenario 10: 262,169 million RWF or 13.42% of the government budget, scenario 28: 188,876 million RWF or 9.66% of the government budget, scenario 46: 115,584 million RWF or 5.91% of the government budget, scenario 64: 42,291 million RWF or 2.16% of the government budget, scenario 82: -1,684

million RWF or -0.09% of the government budget, and the less optimistic scenario 92: - 26,057 million RWF or -1.33% of the government budget. With an initial expense of 31 billion RWF the government has a positive return of expenses from scenarios 1 to 46, or from 36 billion RWF to 121 billion RWF.

Therefore, the potential economic loss of excluding persons with disabilities is higher than potential benefits for the government. Investing in social protection schemes to financially support persons with disabilities to access to productive employment can conduct to an interesting return on expenses and to the economic growth.

General Conclusion

In this thesis, we provided an assessment of current and potential coverage of physical and functional rehabilitation care for persons with disabilities, with the final objective to contribute to more inclusive health systems in low- and middle-income countries (LMICs) for the most vulnerable people.

The access to health care including rehabilitation is a basic human right, as stated in the United Nations Convention for the Rights on People with Disabilities (UNCRPD). However, as we observed throughout this thesis, this statement is not obvious for all government of LMICs. There is a high and growing prevalence of severe disability that conducts to a higher demand for rehabilitation care worldwide, and a demand that is not satisfied. In addition, the demand for rehabilitation services will continue to increase in light of global health and demographic trends: populations are ageing; there is an increase of the prevalence of non-communicable diseases, as well as consequences of injuries.

Overview of rehabilitation in low- and middle-income countries

Firstly, at LMICs level, we analyzed barriers from the supply and demand sides of physical rehabilitation care. All these barriers represent a limitation to access to needed rehabilitation care for people with disabilities and people without disabilities who need it. And secondly, we investigated the rehabilitation sector in two countries, a lower-middle income and a low-income countries Cambodia and Rwanda. Analyses have been done in terms of economic and financial flows. We studied physical and functional rehabilitation sectors in both countries and we looked at several elements, namely: a) the provision of rehabilitation services within the health system; b) the financial burden of rehabilitation services for patients; and c) the required expenses in the rehabilitation sector to cover unmet needs.

As regards to our results, **recent legal framework for rehabilitation and disability has been developed in the past decades** and the first one was the UNCRPD that promoted persons with disabilities equal rights. Since this convention, international community supported by the World health Organization members states committed about rehabilitation and assistive technologies through their commitment to strengthen provision of quality rehabilitation at all levels of the health system.

Globally, we observed a **misalignment of funding compared to the scale of needs for rehabilitation and health in LMICs**. This misalignment is visible from both external and domestic funding. However, there is currently a deep dynamic of the international community to improve health financing, in line with the main objectives, the sustainable development goals. But, even investments raised in the health sectors, there is a problematic between donors' investments and priority needs in low-resources settings, particularly regarding to the volume of investments that goes to HIV/AIDS and the extend of the need if we compare to non-communicable diseases. Moreover, there is a gap between emergency and development assistance for health, and a high dependence of LMICs to external financing. Furthermore, this misalignment of funding to the needs of population can be also observed in domestic health expenditures. Particularly in low-income economies, public health budget remains limited and does not satisfied requirements proposed by the international community. This problematic is even worse for the rehabilitation and disability sectors. Until recently, little attention has been received from this sector in terms of financing and laws and policies. As a result, budget for rehabilitation sector is still limited, and the main consequence is a shortage in rehabilitation workforce that have serious implications for the achievement of the sustainable development goals and thus for population health.

Until recently rehabilitation and disability received little attention from governments, and this conducted to a **poor availability of rehabilitation services, a lack of coordination between these services, and a need to make these services available and affordable and at a high quality**. Rehabilitation, as a mainstream service, should be available across all levels of care and to any person with a health condition.

In addition, significant investments in health protection and efforts to extend coverage have been made over the past years, but to date, SDGs are not achieved, in particular SDG 3 on universal health coverage, and existing gaps mainly concern coverage's equity and access to health services. in health has been at the core of international experts' advocacy since the millennium development goals, and the SDGs. **Social protection systems have a major role to play in order to promote social and economic development, as well as more inclusive societies**, and they intend to reduce poverty and smooth income and consumption over lifetime, and redistribute income and wealth within the population. It is commonly accepted that social protection programs have a high positive impact on poverty reduction, under some conditions such as minimum level of administrative and financial capacity, or political will. A comprehensive social protection system will address all these areas with a set of mix

contributory and non-contributory schemes. Finally, efforts made to build these systems, including social protection floors, remains limited and not fast enough compared to the needs.

Two low- and middle-income countries, Cambodia and Rwanda, have been used to concretely understand how physical and functional rehabilitation services are financed, managed and covered by the government and potential non-governmental actors, and how these services are used by persons with and without disabilities in these countries.

Analysis of their rehabilitation sector provided relevant and essential information to better understand how provision of these services could be improved and how the access for vulnerable people, including people with disabilities, could be enhanced in a specific context.

Regarding the results of Cambodia, the prevalence of disability is about 4% of the total non-institutional population, and about 24% of persons aged 60 years and above have a disability with a majority of women. Rehabilitation needs exist and are growing, the rehabilitation service sector in Cambodia remains limited and faces many challenges, particularly the financial capacity to ensure that rehabilitation is available and affordable for those who require it. In Cambodia, growing rehabilitation needs are due to a range of health conditions, but non-communicable diseases are the top ranking causes of disability in Cambodia in 2015.

Governance of the rehabilitation sector is complex and there is a lack of transparency about its leadership and governance. Rehabilitation services are mainly available outside the health system, and five international organizations operate in the management of physical rehabilitation centers (PRCs) by providing comprehensive services, including assistive devices, for a wide range of impairments. Currently, the MoH provides physical therapy services in a limited number of provincial and national level hospitals, while the MoSVY and international and non-governmental organizations provide functional rehabilitation services (physiotherapy, prosthetics and orthotics (P&O), and other assistive devices) through the 11 PRCs. Moreover, the private sector is the most popular source of treatment before the public sector for first, second and third treatment.

Since 2005, the Ministry of Health has implemented **several health financing schemes:** health equity funds, vouchers and performance-based financing to improve access to basic

health services for the population. In addition, the government works to implement a social health protection scheme for Cambodian people, and There is a variety of social protection schemes in Cambodia: National Social Security Fund (NSSF), the National social security fund for civil servants (NSSF-CS) both, the Social Health Insurance (SHI) both managed by the government, voluntary health insurance (community based health insurance (CBHI) and private companies), Health Equity Funds (HEFs), Government subsidy schemes (SUBO), Vouchers schemes and, other experiences (innovative fundraising and parallel health systems). The **social protection system is very fragmented**, each scheme target a specific part of the population, and management of these mechanisms are operated by various ministries and non-governmental organizations. We noted a limited coverage of the population mainly due to a poor targeting of the population.

Out-of-pocket payments remain high in Cambodia and higher than East Asia and Pacific countries and low- and middle-income countries' average. There is no figure available for the share of rehabilitation within the health sector, but some key actors met during field assignment, estimated that it is between \$3.5 and 4.5 million in Cambodia.

We compared the levels of catastrophic health expenditures to the costs charged to patients of rehabilitation services. Physical therapy services usually do not represent catastrophic health expenditures for patients in public health facilities or in PRCs. But some conditions, such as cerebral palsy, require a high annual number of sessions and therefore the cost charged to the patient is higher. On average, physical therapy sessions are less expensive when patients are seeking care at the nearest facility, mainly because of transport costs. A need for transport financial support may be a possible solution to reduce the cost of patient and improve access to physical therapy services. Currently most of PRCs provide free services to their patients, and according to our estimations, for any prosthesis or orthosis provided the patient does not risk catastrophic health expenditures, even if he follows 10 physical therapy sessions. But when PRCs request fees (full or average price, according to patient's score) there is a risk of poverty for patients when they are seeking for treatment, particularly for lower limb prosthesis and when we include the physical therapy sessions. Therefore, as some costs have not been taken into account in the estimation of the cost charged to the patient (up-stream costs, down-stream costs, and companion(s)'s costs), there is a high probability that the provision of some devices, especially the most expensive (lower limb prosthesis and orthotics) could conduct to catastrophic health expenditures and notably for people living in rural areas, regardless that the PRC charge fees for services or not. And, **if PRCs are**

handover to the government, fees will be applied to patients, thus there will be a need for better rehabilitation coverage in social protection mechanisms in order to avoid systematic catastrophic health expenditures for patients.

Therefore, some initiatives have been done in Cambodia for the rights of access of persons with disabilities to health and rehabilitation services but there is still much to be done. The health system should be less fragmented, more efficient, with a strong governance and leadership from the government, especially the Ministry of Health and the MoSVY. The provision of rehabilitation services should be strengthening in terms of efficiency, quality and quantity of services. A very strong commitment should be undertaken by the government about physical rehabilitation centers, and regulation policies should harmonize the delivery of services for rehabilitation and health in order to build a sustainable, resilient and efficient health system for the population.

As regards to Rwanda's findings, the provision of rehabilitation services within the health system, we find that the rehabilitation sector contains physiotherapy, occupational therapy, and prosthetics and orthotics services. There are 52 physiotherapy services (without private services), and 12 prosthetics and orthotics services, which are not enough to cover the need of the population in term of quantity of services and human resources and in quality of services provided. Overall, there is a gap of rehabilitation professionals as there is no speech therapist, no official training exists for occupational therapists, and many physiotherapists professionals from prosthetics and orthotics services are missing to satisfy demand of rehabilitation services. In addition, as no specific budget is allocated to disability and rehabilitation, we estimated it and we found 5,552 million RWF (\$7 million) for the fiscal year 2016-2017. Rehabilitation budget mainly came from the Ministry of Health, and it represents 0.28% of the total budget of the government. We also estimated the average operating budget for a disability focused center by 472 million RWF (\$561,947). Thus the average operating cost per patient is 304,464 RWF (\$362).

In regards to social security for rehabilitation services, main strengths highlighted are the cover of all primary health care services in the public system and sometimes in the private non-for profit facilities, the inclusion of physiotherapy services in the package of care financially covered. While main weaknesses raised are the coverage of mainly the formal and

public sector, other persons are generally left out of these benefits, prosthesis and orthosis are rarely covered, except in the medical scheme of RSSB while there are very expensive devices with a high risk of impoverishment for patients. Therefore, **no current social security mechanism include a comprehensive financial coverage of rehabilitation care**, particularly for prosthetics and orthotics, the most expensive care for persons with disabilities.

We estimated the cost charged to patients for rehabilitation services for one year, in comparison to the level of catastrophic health expenditures in rural and urban areas. For all conditions (low back pain, clubfoot, and cerebral palsy), all type of social coverage (Government official tariffs from A to E) physiotherapy always represents a catastrophic health expenditure for the household in comparison to the level of CHE in rural areas. Most of devices represent catastrophic health expenditure for all levels considered, national, rural and urban. These estimations reveal that persons with disabilities have to urge the government to take into consideration these facts and act to prevent households from financial risk due to prosthetics and orthotics devices, and more generally for rehabilitation care. **Social protection mechanisms are not enough in Rwanda to protect rehabilitation patients from extreme poverty**, and persons with disabilities have a “double penalty” as they belong to the poorest population and they have basic and specific health care needs due to their condition.

The economic gains for the government due to rehabilitation expenses have been estimated in Rwanda. We defined economic gains as the result of relevant expenses in the rehabilitation sector, and thus the inclusion of people with disabilities in the labor market. If rehabilitation services, at least prosthetics and orthotics, and physiotherapy, will be integrated into the *CBHI-mutuelle*, the government will have to disburse 31 billion of RWF to cover the cost of all needs for a given year. If the government increases by 20% the budget of the Ministry of Health, it will allow this Ministry to dedicate this budget to the coverage of rehabilitation needs for CBHI members. We also evaluated the expenses required at health center’s level and we find that 4,7 billion of RWF are necessary to open a basic physiotherapy service in all health centers (investment expenditures on the first year, and operating expenditures in the following years). It represents expenses of 0.24% in the government budget, 3.03% in the Ministry of Health budget, 9.90% in the Ministry of Local Governance budget and 84.39% in the rehabilitation budget. We estimated the economic gains due to the financial coverage of rehabilitation services for persons with disabilities, according to several scenarios. The annual return on expenses for the government varies from 1,236 million RWF in the more pessimistic

scenario to 121,115 million RWF in the more optimistic one and represents from 0.06% to 6.20% of its total budget and from 2.61% to 78.21% of the Ministry of Health budget, regarding the scenario considered. Based on a 5 years plan, the potential return on expenses for the government on this period greatly varies according to the scenario: scenario 1: 453,458 million RWF or 23.20% of the government budget, scenario 10: 262,169 million RWF or 13.42% of the government budget, scenario 28: 188,876 million RWF or 9.66% of the government budget, scenario 46: 115,584 million RWF or 5.91% of the government budget, scenario 64: 42,291 million RWF or 2.16% of the government budget, scenario 82: -1,684 million RWF or -0.09% of the government budget, and the less optimistic scenario 92: -26,057 million RWF or -1.33% of the government budget. With an initial expense of 31 billion RWF the government has a positive return of expenses from scenarios 1 to 46, or from 36 billion RWF to 121 billion RWF.

Therefore, **the potential economic loss of excluding persons with disabilities is higher than potential benefits for the government.** Investing in social protection schemes to financially support persons with disabilities to access to productive employment can conduct to an interesting return on expenses and to the economic growth.

The added value of the results of this thesis lies in its very operational dimension due to its implementation methods (CIFRE scholarship) with a non-governmental organization. The case study methodology presented in this thesis has been the subject of other similar studies in other low- and middle-income countries. An analysis of the lessons learned from these studies will soon be the subject of a scientific publication. And, policy communications will be developed for policy makers of the countries studied with an overall advocacy objective. In addition, Humanity & Inclusion will use the results of this thesis to refine its knowledge in the field of health and rehabilitation economics and it also opens the way to new economic perspectives within the projects of this organization. As an example, the methodology presented in the chapter 1 about the cost analysis of a rehabilitation center will be deployed at the level of HI's programs in order to obtain data, non-existent to date, to assist the joint decision-making process between the NGO and the government on the implementation of actions in the rehabilitation sector. Thus the work of a health economist is certainly necessary to help these humanitarian actors to extend their knowledge, refine decision-making, and advocate with governments or technical and financial partners.

Recommendations of good practices for healthy rehabilitation services integrated in the health system in low- and middle-income countries, including Rwanda and Cambodia:

- Conduct a systematic assessment of the rehabilitation sector in order to obtain a baseline that will provide support to policy makers for better evidence-based decisions, particularly in countries where demand for rehabilitation care is high and provision of services is limited.
- Assess existing policies and services, identify priorities to reduce health inequalities and plan improvements for access and inclusion.
- Develop, finance and promote research studies and data collection on disability and rehabilitation. There is an urgent need to improve data collection, analysis, synthesis and dissemination on rehabilitation and disability in order to obtain accurate and comparable data across different countries.
- Prioritization of rehabilitation in national strategy is essential for countries and has to be adapted to their level of maturity, availability of resources elements of the health system.
- In the context of universal health coverage, implementing a social protection system in LMICs is an absolute necessity to counter the barriers to access to health care faced by the population. However, each country is different, and therefore each health insurance package must be developed according to the needs of the population.
- Rehabilitation services should be integrated in the health system, and they should be integrated in and between primary, secondary and tertiary levels of the health system. Multidisciplinary rehabilitation should be provided to those who need it, both community and hospital rehabilitation services should be made available, and hospitals should include specialized rehabilitation units that provide inpatient rehabilitation.
- A situational efficiency analysis on rehabilitation financing should be conducted by the government to identify potential bottlenecks and address identified issues.
- Following the situational efficiency analysis and if applicable, resources should be allocated to rehabilitation services in order to meet the recommendations on service delivery. And when health insurance exists, it should cover rehabilitation services.

- Regarding the provision of assistive products, it is recommended to provide them in priority to those who need them, as well as providing adequate and quality training to patients when assistive products are provided.
- Improving access to quality, affordable health care services, which make the best use of available resources.
- As rehabilitation is a crosscutting sector and several factors interact to inhibit access to health care, reforms in all the interacting components of the health care system are required.
- Make changes to comply with the CRPD.
- Establish health care standards related to care of persons with disabilities with enforcement mechanisms.
- Where private health insurance dominates health care financing, ensure that people with disabilities are covered and consider measures to make the premiums affordable.
- Ensure that people with disabilities benefit equally from public health care programs.
- Use financial incentives to encourage health-care providers to make services accessible and provide comprehensive assessments, treatment, and follow-ups.
- Consider options for reducing or removing out-of-pocket payments for people with disabilities who do not have other means of financing health care services.
- Provide a broad range of modifications and adjustments (reasonable accommodation) to facilitate access to health care services.
- Empower people with disabilities to maximize their health by providing information, training, and peer support.
- Promote community-based rehabilitation to facilitate access for disabled people to existing services.
- Identify groups that require alternative service delivery models, for example, targeted services or care coordination to improve access to health care.
- Integrate disability education into undergraduate and continuing education for all health-care professionals.
- Train community workers so that they can play a role in preventive health care services.
- Provide evidence-based guidelines for assessment and treatment.

The most important key to improve access to rehabilitation services in LMICs is the willingness of the government and its ability to mobilize its resources, and to apply governance functions in order to work towards the UHC objective.

There are many sources of inefficiency, ineffectiveness, lack of governance, funding, human resources, etc., from the supply side of the rehabilitation sector in terms of misalignment of funding and governance and leadership. However, it seems that there is not one model that fits all approach to reform health systems, and to address these issues. Governments of low- and middle-income countries can use best practices principles in order to improve effectiveness and efficiency of health systems and provide high quality, in sufficient quantity, affordable rehabilitation services to the population.

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Appendix

1. Appendix of the General introduction

List of the pre-selected 27 countries for the case studies:

- Afghanistan
- Bangladesh
- Burkina Faso
- Burundi
- Cambodia
- Chad
- China
- Democratic Republic of Congo
- Ethiopia
- Haiti
- India
- Iraq
- Kenya
- Korea, Dem. People's Rep.
- Lao PDR
- Mali
- Morocco
- Nepal
- Palestine
- Rwanda
- Somalia
- South Sudan
- Sri Lanka
- Tajikistan
- Thailand
- Togo
- Vietnam

2. Appendix of Chapter 1

2.1. Information to be prepared for the workshop

Information to be gathered	Person(s) in charge of the data collection
Excel file: CC-Rehab tool	
1. “Staff and wages”: List of all centre staff, either full time or part time, technical, clinical, and support; List of basic monthly salaries paid by the employer.	Administrative staff
2. “Direct labour cost”: All book keeping information concerning benefits such as insurance policies, list of extra pay due to various reasons (assistance of individuals, bonuses for excellent performance, paid overtimes), bills for providing uniforms and their periodic cleaning, benefits for the team such as free tea/coffee/water/medicine or lunch, expenses of daily transport, if paid by the employer (transport may be organized by the employer or the expenses for public transport is reimbursed); Number of official hours worked (does working time include breakfast break, break for lunch, etc.?). The number of hours worked must be taken as net for the calculation. Public/governmental regulation concerning workforce; Calendar to identify public and religious holidays.	Administrative staff
3. “Indirect cost of production”: Inventory of equipment and furniture; Construction costs of buildings, drawings; Standard lists of equipping or purchasing created by headquarters, if an ongoing project is considered; Receipts and/or book-keeping data concerning running costs, as named in this sheet; Contracts with sub-contractors or leasing contracts, etc.	Administrative staff
5. “Statistics of the centre”: Statistics of patients by gender, age, type of cases, and type of care received; Data on the utilization of beds in the centre and on the number of days of care of patients; Number of devices produced and number of sessions provided to patients.	Administrative staff Clinical staff
Excel file: Annex CC-Rehab tool	
0. “Selection of costed care”: List of rehabilitation care to be costed. List of PT, OT and ST sessions to be costed. List of AT products to be costed.	Clinical staff
1. “PT/OT/ST time”: List of technics used per physiotherapy, occupational therapy and speech therapy sessions. List of average time spent per session provided.	Physiotherapists, occupational therapists, and speech therapists
2. “PT/OT/ST material”: List of material used per physiotherapy, occupational therapy and speech therapy sessions. Price of the used material as billed without any add-on for transport, insurance, losses, etc.	Physiotherapists, occupational therapists, and speech therapists

1. “AT time”: List of time spent per P&O and bench workers for the production of assistive products.	Prosthetists and orthotists
2. “AT material”: List of material and components used per assistive products. Price of the used material and components as billed without any add-on for transport, insurance, losses, etc.	Prosthetists and orthotists

2.2. Costs analysis of rehabilitation service: extracts from the tool

Extract from the main Excel file, the tab “Staff and wages”.

Level of training / Status	Name	Surname	Full-time/Part-time %	Occupational level in %	Post	Monthly gross salary 100% full-time as paid by the employer	Salary according to the post
Prosthetics and Orthotics' service							
Head of P&O service					0		0,00
<i>Sum of posts</i>					0		0,00
P&O Category I (ISPO)					0		0,00
					0		0,00
					0		0,00
<i>Sum of posts</i>					0		0,00
P&O Category II (ISPO)					0		0,00
					0		0,00
					0		0,00
					0		0,00
<i>Sum of posts</i>					0		0,00
Technicians / Bench workers							
					0		0,00
					0		0,00
					0		0,00
					0		0,00
					0		0,00
<i>Sum of posts</i>					0		0,00
Apprentices							
					0		0,00
<i>Sum of posts</i>					0		0,00
Helping Hands in Production							
					0		0,00
<i>Sum of posts</i>					0		0,00
Stock Keepers							
					0		0,00

Extract from the main Excel file, the tab “Direct labor cost”.

69	Time Budget of services	
70	Assistive technology service	
71	Quantity of P&O, see above	0,00
72	minus Head of AT service (so far as not directly producing)	1,00
73	= Quantity of P&O in Direct Production	-1,00
74	Quantity of Benchworkers Staff, see above	0,00
75	= Quantity of Benchworkers in Direct Production	0,00
76		
77	Physiotherapy service	
78	Quantity of PT Staff, see above	0,00
79	minus Quantity of Apprentices, see above	0,00
80	minus Head of PT service (so far as not directly producing)	1,00
81	= Quantity of PT Staff in Direct Production	-1,00
82		
83	Occupational therapy service	
84	Quantity of OT Staff, see above	0,00
85	minus Quantity of Apprentices, see above	0,00
86	minus Head of OT service (so far as not directly producing)	1,00
87	= Quantity of OT Staff in Direct Production	-1,00
88		
89	Speech therapy service	
90	Quantity of ST Staff, see above	0,00
91	minus Quantity of Apprentices, see above	0,00
92	minus Head of ST service (so far as not directly producing)	1,00
93	= Quantity of ST Staff in Direct Production	-1,00
94		
95		
96	Working Days per Year : see note I (263 or 289 or 314)	263,00
97	plus Overtime per Head of Staff in Days (pHoSiD)	
98	minus Leave pHoSiD	
99	minus Public Holidays pHoSiD	
100	minus Sick Leave (Average) pHoSiD	
101	minus Paid Release due to Political Regulations posed	
102	minus Paid Release due to Other Reasons pHoSiD	
103	= Working Time per Head of Staff in Days	263,00
104		
105	Hours per Working Day	
106	Official Working Time per Head of Staff in Hours	0,00

Extract from the main Excel file, the tab “Indirect cost of production”.

A. INDIRECT COSTS OF PRODUCTION								
	Value of investment (including all additional expenses)	Years of use	Sum of depreciation and/or consumption as documented (bill)	Proposed % per year	Alternatives if no information available	Sum of depreciation and/or consumption as estimated: Value of investment X Yearly rate of depreciation	Costs per gear (sum of documented and/or estimated figures)	
11	DEPRECIATION (out of sum of investment as listed in the							
12	of building (roofed with corrugated iron) & general outdoor investment		#DIV/0!	0,04	2,50 USD per sm under roof		#DIV/0!	
13	of building (roofed with tiles) & general outdoor investment		#DIV/0!	0,03	3,75 USD per sm under roof		#DIV/0!	
14	of central / decentral heating system(s) or A/C		#DIV/0!	0,07			#DIV/0!	
15	of fixed machinery		#DIV/0!	0,07			#DIV/0!	
16	of mobile machinery		#DIV/0!	0,20			#DIV/0!	
17	of service furniture		#DIV/0!	0,07			#DIV/0!	
18	of vehicle park (fill in the following categories):							
19	pick-up		#DIV/0!	0,20	20% out of 17.300 USD, insert 3.460		#DIV/0!	
20	4-wheel-drive		#DIV/0!	0,20	20% out of 26.500 USD, insert 5.300		#DIV/0!	
21	motor bike		#DIV/0!	0,20	20% out of 1.250 USD, insert 250		#DIV/0!	
22	bicycle		#DIV/0!	0,10			#DIV/0!	
23	of hand tools in use		#DIV/0!	0,25	ca. 120 USD per technician and year		#DIV/0!	
24	of investment in the clinical area (indoor) and in gait training area (outdoor)		#DIV/0!	0,07			#DIV/0!	
25	rent or leasing of land and/or building(s)		#DIV/0!				#DIV/0!	
26	rent or leasing of equipment without vehicles		#DIV/0!				#DIV/0!	
27	RUNNING COSTS PER YEAR							
28	MAINTENANCE OF TECHNICAL SERVICES							
29	of building carried out by external enterprises on regular basis		#DIV/0!		1,25 USD per sm under roof		#DIV/0!	
30	of building carried out by internal means on regular basis		#DIV/0!		0,55 USD per sm under roof		#DIV/0!	
31	of equipment carried out by external enterprises on regular basis		#DIV/0!		3,00% p.a. out of the investment		#DIV/0!	
32	of equipment carried out by internal means on regular basis		#DIV/0!		1,50% p.a. out of the investment		#DIV/0!	
33	consumables of machinery, such as sandpaper, etc.		#DIV/0!		2,60% p.a. out of the investment		#DIV/0!	
34	minor replacement in center utilities		#DIV/0!		ca. 125 USD per head of techn. staff		#DIV/0!	
35	RUNNING COSTS OF TRANSPORT UTILITIES							
36	fuel (may include fuel for generators, if impossible to be separated)		#DIV/0!				#DIV/0!	
37	maintenance and repair		#DIV/0!				#DIV/0!	
38	insurance and permanent tax & fees		#DIV/0!				#DIV/0!	
39	pick-up		#DIV/0!		3.200 USD total cost per year		#DIV/0!	
40	4-wheel-drive		#DIV/0!		4.000 USD total cost per year		#DIV/0!	
41	motor bike (2.500 km per year)		#DIV/0!		500 USD total cost per year		#DIV/0!	
42	add-on for off-road drive, if off-road use > 25% of total mileage		#DIV/0!		+ 30% on the above named amounts		#DIV/0!	
43	rent or leasing of vehicles		#DIV/0!				#DIV/0!	
44	ELECTRICITY AND WATER							
45	consumption delivered by external means		#DIV/0!				#DIV/0!	
46	fuel for generator		#DIV/0!		ca. 7 USD/h at 100 KVA		#DIV/0!	
47	maintenance of generator (not stand-by type)		#DIV/0!		550 USD per year		#DIV/0!	
48	depreciation of generator		#DIV/0!	0,07	550 USD per year and generator		#DIV/0!	
49	solar energy - depreciation		#DIV/0!	0,08	0,70 USD per sm and year		#DIV/0!	
50	solar energy - maintenance		#DIV/0!		0,05 USD per sm		#DIV/0!	
51	water (if no own well available) / disposal		#DIV/0!				#DIV/0!	
52	HEATING, if not based of electricity							
53	PROFESSIONAL SHORT TERM TRAINING							
54						300 USD p. technician		#DIV/0!
55	SUBCONTRACTED WORK & SERVICES							
56	OTHER COSTS					5% out of running costs (no depr.) name	#REF!	#DIV/0!
57	SUM OF INDIRECT PRODUCTION COSTS PER YEAR FOR THE ENTIRE CENTER							#DIV/0!

Extract from the Annex of the main Excel file, the tab “Physiotherapy calculations”.

Costs of Physiotherapy										
Cells in yellow need to be filled in by the user. No other cells should be changed.										
* This table includes only automatic formulas.										
* Below the table, you can analyze findings for physiotherapy service.										
Physiotherapy session	Cost of material and components			Standard labour minutes	Cost per standard minute (based on 8 hour day, net)	Add-on for unavailable idle times	Labour cost	PT Add-on per minute (see calculation of indirect production costs)	Administrative Add-on per minute (see calculation of indirect production costs)	Prime cost
	Imported	Local	Total (including add-on of 10%)							
0	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
1	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
21	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
22	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
23	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
24	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
25	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
26	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
27	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
28	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
29	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
30	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
31	0,00	0,00	0,00	0	#DIV/0!	1,45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

3. Appendix of the Chapters 2 and 3

3.1. Assessment of the technical level of rehabilitation services

3.1.1. Questionnaire for physiotherapy services

Number	Question	Scoring standard
GENERAL LEVEL OF EQUIPMENT		
1	<i>How would you evaluate the level and operational condition of the equipment?</i>	
	Good	3
		2
	Inadequate	1
2	<i>Does this service have procedures to apply when providing services?</i>	
	Yes	1
	No	0
3	<i>If Yes, to what degree are procedures followed?</i>	
	Always	3
	As often as possible	2
	Rarely	1
	Never	0
4	<i>If Yes, Are procedures regularly kept up to date?</i>	
	Every year	3
	Every 5 years	2
	Every 10 years	1
	Never updated	0
LEVEL OF PERFORMANCE PER ACTIVITY		
5	<i>Does this service have a separate area for child rehabilitation?</i>	
	Yes	1
	No	0
6	<i>Does this service have a separate area for adult rehabilitation?</i>	
	Yes	1
	No	0
7	<i>Are there physiotherapy tables in this service?</i>	
	Yes	1

	No	0
8	<i>If yes, do you use the equipment:</i>	
	Regularly	2
	Sometimes	1
	Never	0
9	<i>If never, why?</i>	
	Maintenance problems	
	Lack of training	
	Rarely needed	
	Other	
10	<i>Do you have parallel bars available in this service?</i>	
	Yes	1
	No	0
11	<i>If yes, do you use the equipment:</i>	
	Regularly	2
	Sometimes	1
	Never	0
12	<i>If never, why?</i>	
	Maintenance problems	
	Lack of training	
	Rarely needed	
	Other	
13	<i>Do you have wall bars available in this service?</i>	
	Yes	1
	No	0
14	<i>If yes, do you use the equipment:</i>	
	Regularly	2
	Sometimes	1
	Never	0
15	<i>If never, why?</i>	
	Maintenance problems	
	Lack of training	
	Rarely needed	

		Other	
16	<i>Do you have a rehabilitation bike in this service?</i>		
		Yes	1
		No	0
17	<i>If yes, do you use the equipment:</i>		
		Regularly	2
		Sometimes	1
		Never	0
18	<i>If never, why?</i>		
		Maintenance problems	
		Lack of training	
		Rarely needed	
		Other	
19	<i>is there a pulley-therapy area?</i>		
		Yes	1
		No	0
20	<i>If yes, do you use the equipment:</i>		
		Regularly	2
		Sometimes	1
		Never	0
21	<i>If never, why?</i>		
		Maintenance problems	
		Lack of training	
		Rarely needed	
		Other	
22	<i>Is there an electrotherapy area?</i>		
		Yes	1
		No	0
23	<i>If yes, do you use the equipment:</i>		
		Regularly	2
		Sometimes	1
		Never	0
24	<i>If never, why?</i>		

	Maintenance problems	
	Lack of training	
	Rarely needed	
	Other	
25	<i>Is there a stock for consumables?</i>	
	Yes	1
	No	0
26	<i>The consumables stock-level is:</i>	
	Good	3
	Some non-operational equipment	2
	Inadequate	1
27	<i>What is the waiting time for an appointment in your service?</i>	
	No waiting	3
	<1week	2
	1w-1month	1
	>1month	0
28	<i>How long patients are waiting in average to receive care in your service?</i>	
	<30m	3
	30-60m	2
	1-2h	1
	>4h	0
29	<i>Among people who requested rehabilitation care, how many have renounced to cares during the last year?</i>	
	<10	
	[10;20[
	[20;30[
	[30;40[
	[40;50[
	>50	

3.1.2. Questionnaire for prosthetics and orthotics

Number	Question	Scoring standard
GENERAL LEVEL OF EQUIPMENT		
1	<i>How would you evaluate the level and operational condition of the equipment?</i>	
	Good	4
	Some improvement needed	3
	Some non-operational equipment	2
	Inadequate	1
2	<i>Does this service have procedures to apply when providing services?</i>	
	Yes	1
	No	0
3	<i>If Yes, to what degree are procedures followed?</i>	
	Always	3
	As often as possible	2
	Rarely	1
	Never	0
4	<i>If Yes, Are procedures regularly kept up to date?</i>	
	Every year	3
	Every 5 years	2
	Every 10 years	1
	Never updated	0
LEVEL OF PERFORMANCE PER ACTIVITY		
5	<i>In the measurement room, the taking of plaster impressions and measurement is:</i>	
	Good	3
	Needs to be improved	2
	Inadequate	1
6	<i>in the plaster-cast room, the taking of plaster impressions and measurement is:</i>	
	Good	3
	Needs to be improved	2
	Inadequate	1
7	<i>In the assembly room for manufacturing components, assembly and adjustments, the level of equipment is:</i>	
	Good	3

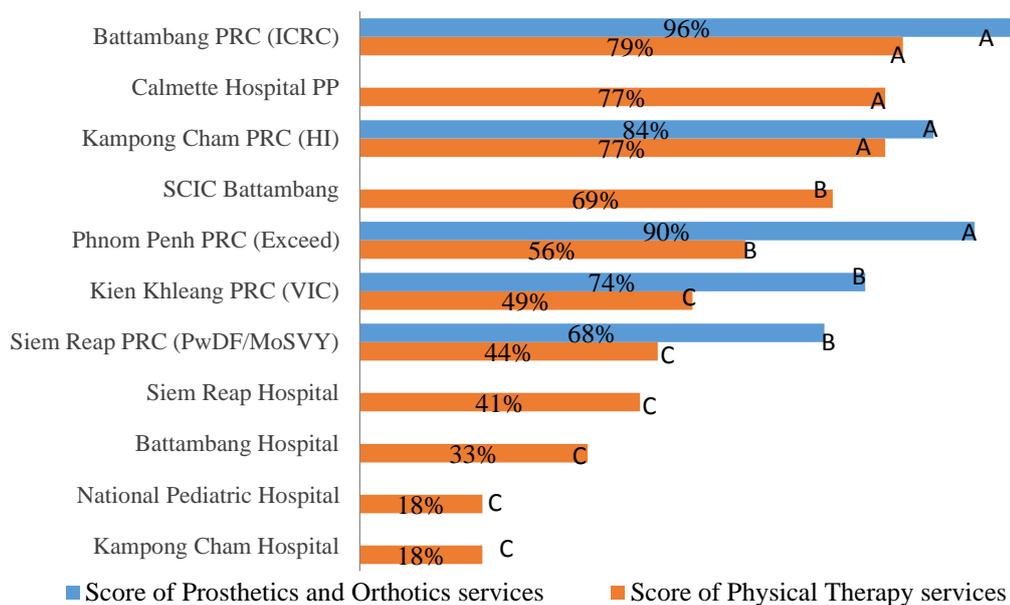
		Needs to be improved	2
		Inadequate	1
8	<i>In the machine room for drilling, milling and welding, the level of equipment is:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
9	<i>In the small store for storing equipment and components, the workshop managed by the workshop manager is:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
10	<i>In the plastics room, the level of equipment is:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
11	<i>In the room for shoemaking, finishing equipment and fabricating shoes, sandals and orthopaedic insoles, the equipment is:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
12	<i>In the equipment fitting room, the equipment and tools are:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
13	<i>In the storage room for equipment and components are:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1
14	<i>The stock levels of equipment and components are:</i>		
		Good	3
		Needs to be improved	2
		Inadequate	1

15	<i>What type of technologies is used in your service?</i>	
	Essentially local products	
	Imported products and components – high quality	
	Imported products and components – ordinary quality	
16	<i>What is the waiting time for measurement in your service?</i>	
	Less than a week	3
	From a week to a month	2
	Longer than a month	1
17	<i>What is the waiting time between measurement and fitting in your service?</i>	
	Less than a week	3
	From a week to a month	2
	Longer than a month	1
18	<i>What is the waiting time between fitting and adjustment in your service?</i>	
	Less than a week	3
	From a week to a month	2
	Longer than a month	1

3.1.3. Main outcomes

Facility	Score Physical therapy	Score in %	Category (A, B, C)	Score P&O and technical aids	Score in %	Category (A, B, C)
Battambang PRC (ICRC)	31	79%	A	48	96%	A
Kampong Cham PRC (HI)	30	77%	A	42	84%	A
Calmette Hospital PP	30	77%	A			
SCIC Battambang	27	69%	B			
Phnom Penh PRC (Exceed)	22	56%	B	45	90%	A
Kien Khleang PRC (VIC)	19	49%	C	37	74%	B
Siem Reap PRC (PwDF/MoSVY)	17	44%	C	34	68%	B
PT unit Siem Reap Hospital	16	41%	C			
PT unit Battambang Hospital	13	33%	C			
PT unit Kampong Cham Hospital	7	18%	C			
National Hospital Pediatric	7	18%	C			
Out of	39	100%		50	100%	

Figure 49 : Technical level of physical therapy and prosthetics and orthotics services of facilities of the sample, 2016



Source: Author, based on data collected.

3.2. Overview of provincial rehabilitation centers (PRCs) costs in 2013 in

Cambodia

GENERAL OVERVIEW CAMBODIA PRC'S 31 December 2013																			
	National HR				Main responsibility		Services								Approximative costs per partner in USD				Cost per client* USD
	IO contract	Daily Worker	Contract Worker	Civil Servant	Total	Technical	Management	Prostheses	Orthoses	Wheel chairs	PT clients	SEI clients	Total clients	Covered population (2008x107%)	%	PWDF	PoVSY	IO	
ICRC			16	25	41	PWDF	PWDF									89,831		196,281	286,112
		1	30	27	58	PWDF	PWDF	1,162	614	352		51	7,747	2,599,727	0.30%	78,093		414,878	492,971
		19	1	18	38	PWDF	PWDF	435	552	228		42	3,316	842,764	0.39%	48,593		206,729	255,322
ICRC subtotal	1	20	47	70	137			1,597	1,166	580	0	93	11,063	3,442,491	0.32%	225,472		842,774	1,068,246
\$	0%	15%	34%	51%	100%			48%	30%	63%	0%	15%	40%			21%		79%	100%
EXCEED																			
		30		6	36	EXCEED	EXCEED	256	457				2,778	1,408,562	0.20%				
		15		6	21	EXCEED	EXCEED	186	347				2,342	513,188	0.46%				
		8	11	1	20	EXCEED	EXCEED	243	229				1,118	399,671	0.28%				
EXCEED subtotal	53	11	13	77	100%			685	1,033	143	0	492	6,238	2,321,421	0.27%	47,500		352,500	400,000
%	69%		14%	17%	100%			20%	27%	16%	0%	78%	22%		12%		88%	100%	
HIF	1	21		8	29	HIF	HIF	256	443	192	9,035	43	2,118	1,996,777	0.11%	10,800		209,200	220,000
%	72%	0%	0%	28%	100%			8%	12%	21%	100%	7%	8%		5%		95%	100%	
VIC		3	23	9	35	PWDF	PWDF	239	662				3,723	1,408,562	0.26%	160,000		240,000	400,000
		1	10	1	12	PWDF	PWDF	116	161				736	346,822	0.21%	48,000		135,000	183,000
			11	5	16	PWDF	PWDF	152	233				1,464	1,553,837	0.09%	54,338		164,000	218,338
VIC subtotal	0	3	44	15	63			507	1,056	0	0	0	5,923	3,309,221	0.18%	262,338		539,000	801,338
%	2%	5%	70%	24%	100%			15%	28%	0%	0%	0%	21%					67%	
PWDF			8	9	17	PWDF	PWDF	168	81				1,489	1,845,916	0.08%				93,500
			9	7	16	PWDF	PWDF	141	48				894	907,272	0.10%				87,500
													60						48,000
																			#DIV/0!
																			#DIV/0!
		0	17	16	33			309	129	0	0	0	2,443	2,753,188	0.09%	299,000		0	299,000
		0%	52%	48%	100%			9%	3%	0%	0%	0%	9%		0%		0%	0%	100%
PWDF subtotal	75	23	119	122	339			3,354	3,827	915	9,035	628	27,785	13,823,098	0.20%	845,110		1,943,474	2,788,584
%	22%	7%	35%	36%	100%			100%	100%	100%	100%	100%	100%		30%		70%	100%	

* NB: total program costs divided by total beneficiaries. Cannot be compared as it needs differentiation between types of provided services/beneficiary etc.

Source: ICRC, Cambodia Physical Rehabilitation Programme and the Physical Rehabilitation Sector, 2014.

3.3.Socio-economic assessment tool for PRCs

3.3.1. Tab “Board” of the SE Assessment form



Socio-Economic Assessment Form
Kampong Cham Physical Rehabilitation Center



Date of the first assessment		01/01/17
Interviewer	Name	
	Position	

Date of the second assessment		01/01/18
Interviewer	Name	
	Position	

Check if the situation of the client have changed since the Assessment N°1

Client		Yes / No	Comments
Client identification number			
Name			
Date of Birth			
Sex			
Province			
District			
Commune			
Village			
Rural or Urban area			
Full address (House N°, street name/N°, if it exists)			
Phone number			
Does the head of households have a national ID card? What is the ID number?	ID Card No.		
Other information			

3.3.2. Tab “Assessment n°1” of the SE assessment Excel file.



Socio-Economic Assessment N°1

Kampong Cham Physical Rehabilitation Center



Date of the assessment: 01/01/17

1. Is your house the property of your household? Or does your household rent it from other people?

	Patient Answer
a) No house	
b) Not own house but don't pay rent	
c) Rent house	
d) Own house or live with parents	

2. Main construction material of the house's roof.

	Points	Patient Score
No house /Leaves, Thatch	8	
Thatch, palm leaves, plastic sheet, ta	4	
Corrugated iron	2	
Tiles, fibrous cement, or concrete	0	

3. Main construction material of the house's exterior walls.

	Points	Patient Score
thatch, palm leaves, or other soft materials	4	
Plywood or corrugated iron	2	
Wood	1	
Cement, bricks or concrete	0	

4. Main construction material of the house's floor.

	Points	Patient Score
No house/ Ground	4	
Bamboo	2	
Wood	1	
Wood (good)/Cement/Tile	0	

5. How many meters is the floor area of your house?

	Points	Patient Score
No house/ <20M2 (live with other or rent house)	4	
20-50M2	2	
51-60 M2	1	
> 61M2	0	

6. General condition of the house.

	Points	Patient Score
No house/ Dilapidated	4	
Livable	2	
Average	1	
Good (safe)	0	

7. Does your household have radio, phone, TV, video player, karaoke machine, water pump, video camera, threshing machine, computer ...

	Points	Patient Score
Nothing or one small radio	6	
Large radio OR black and white TV OR mobile telephone	3	
Colour TV and/or stereo and/or video player/karaoke machine and/or water pump	1	
Phone (expensive), Video camera or threshing machine or rice milling machine or generator, Computer (expensive)	0	

8. Does your household have any means of transport?

	Points	Patient Score
(Total value less than 150,000 riel) • No means of transportation • Or one old bicycle only • Or one small old rowboat or canoe	8	
(Total value from 150,000 to less than 500,000 riel) • Old bicycle • Very old motorbike • Old horse or oxen cart • Old, medium-size rowboat (without motor)	4	
(Total value over 500,000 riel) • Bicycle in fair condition • Motorcycle in fair condition • New horse/oxen cart • New, large rowboat or canoe OR boat with motor • Motorbike remorque • Kou yon (hand tractor)	2	
(Very high total value) • Tractor • Car/van/truck	0	

9. Which activity is the main income source for your household: growing rice or other crops or orchard; fishing; or other activities?

According to the answer, ask the related question

Growing rice or other crops or orchard	Ask Q9
Fishing	Ask Q10
Other activities	Ask Q11

10. How many ar of land does your household use for growing rice, other crops or an orchard?

(Please include your own land, land rented from others, and land around the house.)

	Points	Patient Score
From 0 to 0.2 ha	8	
From 0.2 to 0.5 ha	4	
From 0.5 to 2 ha	2	
More than 2 ha	0	

11. What types of fishing equipment do you have: line hooks, throw net, set net, drag net, other? (not including

	Points	Patient Score
None or very little equipment and in poor condition	8	
Little equipment and in fair condition	4	
Enough equipment	2	
Enough equipment and of good quality	0	

0

12. What activity provides the main source of income for your household?

	Points	Patient Score
No work/job or beg, supported by others	8	
Work as labourer or occasionally working	4	
Micro business, skilled labourer or job with monthly permanent wage	2	
Medium- or large-size business	0	

13. Where do you live?

According to the answer, ask the related question

Living on land	Ask Q12
Living on water	Ask Q13

14. Does your household have pigs? goats? cows? buffaloes? horses? How many..?

Count weaners and older

	Points	Patient Score
• No pigs or goats • No cows, buffaloes or horses • No fish raising for sale	10	
• 1-3 pigs • OR 1-5 goats • OR 1-2 cows, buffaloes or horses • No fish raising for sale	5	
• 4-9 pigs • AND/OR 6-19 goats • AND/OR 3-9 cows, buffaloes or horses • AND/OR does fish raising for sale	3	
• 10 or more pigs • AND/OR 20 or more goats AND/OR 10 or more cows, buffaloes or horses (total)	0	



0

15. Does your household have pigs? How many are weaners and older?		
	Points	Patient Score
• No pigs • No fish raising for sale	10	
• 1-3 pigs OR fish raising for sale, but not both	5	
• 4-9 pigs • AND/OR does fish raising for sale	2	
• 10 or more pigs • AND/OR does fish raising for sale	0	

16. During the last 12 months, did your household owe rice or borrow rice from other people?		
	Points	Patient Score
8-12 months	8	
3-7 months	4	
0-2 months	2	
Never	0	

17. How many persons in your household cannot produce an income? Because of young or old age, school pupil, poor health, disability, looking after children, or any other reasons		
	Points	Patient Score
Nobody can produce an income	8	
More than half of all household members	4	
Equal to or less than a half, but more than one quarter of all household members	2	
Equal to or less than one quarter of all household members	0	

3.4. Tariffs, Ministry of Health, Republic of Rwanda

Images below are official tariffs for Prosthetics and orthotics services implemented by the Ministry of Health in Rwanda since January 2017.

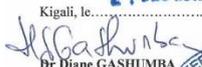
DENOMINATION APPAREILLAGE ORTHOPEDIQUE	UNITE	MUTUELLE DE SANTE	MMI, MUTUELLES D'UNIVERSITE ET INSTITUTS SUPERIEURS	RAMA	INGO, DIPLOMAT AND PRIVATE
AIDES DE MARCHÉ					
Béquille sous axillaire locale(Local axillary crutch)	Paire	5,000	6,900	7,500	8,280
Béquille sous axillaire locale pour enfant moins de 12ans	paire	2,500	3,450	3,750	4,140
Béquille sous axillaire importée(Imported axillary crutch)	Paire	40,000	55,200	60,000	66,240
Canne anglaise locale	paire	8,600	11,868	12,900	14,242
Canne anglaise locale pour enfant moins de 12 ans	1 Pièce	4,300	5,934	6,450	7,121
Canne anglaise importée(Imported Elbow crutch):	1 Pièce	15,000	20,700	22,500	24,840
Deambulateur (Walking frame)	Pièce	82,000	113,160	123,000	135,792
Chaise roulante (Wheel chairs)	Pièce	250,000	345,000	375,000	414,000
ORTHESES					
Orthèses du membre inférieur					
Orthèses du pied					
Semelle orthopédique locale (Local Insoles)	Pièce	3,970	5,479	5,955	6,574
Semelle orthopédique importée (Imported insoles)	Pièce	13,860	19,127	20,790	22,952
Compensation externe en caoutchouc (1 cm d'ép.)/Externe compensation of rubber	Pièce	2,500	3,450	3,750	4,140
Compensation externe en liège (1 cm d'ép.)/Externe compensation of cork	Pièce	2,500	3,450	3,750	4,140
Coque talonnière en polypropylène (supramalleora foot orthosis in PPP)	Pièce	19,106	26,366	28,659	31,640
Coque talonnière en cuir à mouler (supramalleora foot orthosis in leather)	Pièce	19,106	26,366	28,659	31,640
Coque talonnière en résine (supramalleora foot orthosis in resin)	Pièce	19,106	26,366	28,659	31,640
Orthèses suro pédièuse - AFO					
Orthèse suro pédièuse sur tracé avec articulations de cheville à étrier locales(Traced AFO with local ankle joint)	Pièce	43,711	60,321	65,567	72,385
Orthèse suro pédièuse sur tracé avec articulations de cheville à étrier importées(Traced AFO with imported ankle joint) pour enfant moins de 12 ans	Pièce	21,856	30,161	32,784	36,194
Orthèse suro pédièuse sur tracé avec articulations de cheville à étrier importées(Traced AFO with imported ankle joint)	Pièce	83,611	115,383	125,417	138,460
Orthèse suro pédièuse sur moulage avec articulation des chevilles Oklahoma	Pièce	70,959	97,923	106,439	117,508
releveur du pied rigide en polypropylène sur moulage (Anti drop foot splint)	Pièce	30,159	41,619	45,239	49,943
releveur du pied rigide en polypropylène sur moulage (Anti drop foot splint) pur enfant de 12 ans	Pièce	15,079	20,809	22,619	24,971
releveur du pied en polypropylène sur moulage avec décharge sous rotulienne (Patella tendon bearing orthosis)	Pièce	34,387	47,454	51,581	56,945
Orthèse suro pédièuse / releveur du pied en polypropylène sur moulage avec articulations de cheville à étrier importées	Pièce	77,559	107,031	116,339	128,438
Orthèses cruro pédièuse - KAFO					
KAFO rigide sur tracé (Traced rigid KAFO)	Pièce	70,899	97,841	106,349	117,409

KAFO rigide sur tracé (Traced rigid KAFO) pour enfant de moins de 12ans	Pièce	35,450	48,921	53,175	58,705
KAFO sur tracé avec articulations de genou locales (Traced KAFO with local knee joint)	Pièce	100,899	139,241	151,349	167,089
KAFO sur tracé avec articulations de genou locales (Traced KAFO with local knee joint) pour enfant de moins de 12 ans	Pièce	50,550	69,759	75,825	83,711
KAFO sur tracé avec articulations de genou & de chevilles à étrier locales (Traced KAFO with knee and ankle local joints)	Pièce	108,399	149,591	162,599	179,509
KAFO sur tracé avec articulations de genou & de chevilles à étrier locales (Traced KAFO with knee and ankle local joints pour enfants de moins de 12 ans)	Pièce	54,200	74,796	81,300	89,755
KAFO sur tracé avec articulations de genou à coulisseaux importées (traced KAFO with imported drop lock knee joint)	Pièce	272,499	376,049	408,749	451,258
KAFO sur tracé avec articulations de genou Hoffa importées(traced KAFO with imported Swiss lock knee joint)	Pièce	334,699	461,885	502,049	554,262
KAFO sur tracé avec articulations de genou à coulisseaux & de cheville à étrier importées	Pièce	319,899	441,461	479,849	529,753
KAFO sur tracé avec articulations de genou Hoffa & de cheville à étrier importées(Traced KAFO with Swiss lock knee joint and Imported ankle joint)	Pièce	374,699	517,085	562,049	620,502
KAFO rigide sur moulage sans articulation (Casted rigid KAFO): Adulte	Pièce	105,986	146,261	158,979	175,513
KAFO rigide sur moulage sans articulation (Casted rigid KAFO): Enfant moins de 12 ans	Pièce	52,993	73,130	79,490	87,756
KAFO sur moulage avec articulations de genou locales(Casted KAFO with local knee joint)	Pièce	135,986	187,661	203,979	225,193
KAFO sur moulage avec articulations de genou locales(Casted KAFO with local knee joint) pour enfant de moins de 12 ans	Pièce	67,993	93,830	101,990	112,596
KAFO sur moulage avec articulations de genou & de cheville à étrier locales(Casted KAFO with local knee and ankle joints)	Pièce	150,986	208,361	226,479	250,033
KAFO sur moulage avec articulations de genou & de cheville à étrier locales(Casted KAFO with local knee and ankle joints) pour enfant de moins de 12 ans	Pièce	75,493	104,180	113,240	125,016
KAFO sur moulage avec articulations de genou à coulisseaux importées (casted KAFO with imported drop lock knee joint)	Pièce	307,586	424,469	461,379	509,362
KAFO sur moulage avec articulations de genou Hoffa importées (casted KAFO with imported Swiss Lock knee joint)	Pièce	369,786	510,305	554,679	612,366
KAFO sur moulage avec articulations de genou à coulisseaux & de cheville à étrier importées(casted KAFO with imported Drop Lock knee joint and ankle joint)	Pièce	354,986	489,881	532,479	587,857
KAFO sur moulage avec articulations de genou Hoffa & de cheville à étrier importées (Casted KAFO with Swiss Lock and ankle joints)	Pièce	417,186	575,717	625,779	690,860
Orthèse ischio pédièuse rigide sur moulage (Casted Rigid KAFO with Ischio weight bearing)	Pièce	112,811	155,679	169,217	186,815
Orthèse ischio pédièuse sur moulage avec articulations de cheville à étrier locales(Casted Rigid KAFO weight bearing knee joint with local ankle joint)	Pièce	127,811	176,379	191,717	211,655
Orthèse ischio pédièuse sur moulage avec articulations de cheville à étrier locales(Casted Rigid KAFO weight bearing knee joint with local ankle joint) pour enfant	Pièce	63,905	88,189	95,858	105,827
Orthèse ischio pédièuse sur moulage avec articulations de genou locales(Casted KAFO weight bearing knee joint with local ankle joint)	Pièce	142,811	197,079	214,217	236,495

Orthèse ischio pédieuse sur moulage avec articulations de genou locales(Casted KAFO weight bearing knee joint with local ankle joint)pour enfant de 12 ans	Pièce	71,405	98,539	107,108	118,247
Orthèse ischio pédieuse sur moulage avec articulations de genou & de cheville à étrier locales(Casted KAFO weight bearing knee joint with knee local and ankle joint)	Pièce	157,811	217,779	236,717	261,335
Orthèse ischio pédieuse sur moulage avec articulations de genou & de cheville à étrier locales(Casted KAFO weight bearing knee joint with knee local and ankle joint)pour enfant de moins de 12 ans	Pièce	78,905	108,889	118,358	130,667
Orthèse ischio pédieuse sur moulage avec articulations de genou à coulisseaux importées	Pièce	314,411	433,887	471,617	520,665
Orthèse ischio pédieuse sur moulage avec articulations de genou Hoffa importées	Pièce	376,611	519,723	564,917	623,668
Orthèse ischio pédieuse sur moulage avec articulations de genou à coulisseaux & de cheville à étrier importées	Pièce	361,811	499,299	542,717	599,159
Orthèse ischio pédieuse sur moulage avec articulations de genou Hoffa & de cheville à étrier importées	Pièce	416,611	574,923	624,917	689,908
Orthèses pelvi pédieuse					
Orthèse pelvi pédieuse sur moulage avec articulations du genou local	Pièce	363,472	501,591	545,208	601,910
Orthèse pelvi pédieuse sur moulage avec articulations du genou local pour enfants de moins de 12ans	Pièce	181,736	250,796	272,604	300,955
Orthèse pelvi pédieuse sur moulage avec articulations du genou et de la cheville locales	Pièce	373,148	514,944	559,722	617,933
Orthèse pelvi pédieuse sur moulage avec articulations du genou et de la cheville localespour enfants de moins de 12ans	Pièce	186,574	257,472	279,861	308,967
Orthèse pelvi pédieuse sur moulage avec articulations du genou verrou coulisseau importé	Pièce	535,072	738,399	802,608	886,079
Orthèse pelvi pédieuse sur moulage avec articulations Hoffa	Pièce	600,624	828,861	900,936	994,633
Orthèse pelvi pédieuse sur moulage avec articulations achappe et verrou coulisseau et cheville importé	Pièce	582,472	803,811	873,708	964,574
Orthèse pelvi pédieuse sur moulage avec articulations Hoffa importées et cheville importée	Pièce	648,024	894,273	972,036	1,073,128
Orthèse d'abduction					
Orthèse d'abduction en polypropylène	Pièce	85,723	118,298	128,585	141,957
Orthèses du membre supérieur					
Orthèse d'extension du poignet sur moulage ou Attèle palmaire	Pièce	20,175	27,842	30,263	33,410
Orthèse du coude / coudière avec articulations locales	Pièce	76,867	106,076	115,301	127,292
Orthèse du coude / coudière avec articulations locales pour enfant de moins de 12 ans	Pièce	38,433	53,038	57,650	63,645
Orthèse thoraco brachiale	Pièce	29,283	40,411	43,925	48,493
Orthèses du crâne et du cou					
Collier cervical / Collier de Schanz	Pièce	8,312	11,471	12,468	13,765
Minerve cervicothoracique	Pièce	47,281	65,248	70,922	78,297
Orthèses du tronc / Corset					
Corset de Cheneau	Pièce	170,212	234,893	255,318	281,871
Corset de Milwaukee	Pièce	353,492	487,819	530,238	585,383
Corset de maintien lombaire pour enfants de moins de 12 ans	Pièce	88,612	122,285	132,918	146,741
Corset de maintien lombaire	Pièce	44,306	61,142	66,459	73,371

Corset de maintien dorso lombaire pour enfants de moins de 12 ans	Pièce	170,378	235,122	255,567	282,146
Corset de maintien dorso lombaire		85,189	117,561	127,784	141,073
Orthèses de positionnement					
Corset siège sans appuis	Pièce	133,484	184,208	200,226	221,050
Corset siège avec adjonction d'appui tête	Pièce	143,572	198,129	215,358	237,755
Corset siège avec adjonction tablette	Pièce	155,501	214,591	233,252	257,510
Corset siège avec adjonction repause pied	Pièce	150,937	208,293	226,406	249,952
Corset siège avec plot d'abduction	Pièce	173,313	239,172	259,970	287,006
Verticalisateur sans adjonction	Pièce	114,067	157,412	171,101	188,895
Verticalisateur avec adjonction d'appui tête	Pièce	123,481	170,404	185,222	204,485
Verticalisateur avec adjonction d'appui tablette	Pièce	144,825	199,859	217,238	239,830
Verticalisateur avec adjonction d'appui roulette	Pièce	134,624	185,781	201,936	222,937
CHAUSSURES ORTHOPEDIQUES					
Chaussures orthopédiques sur mesures	Paire	81,396	112,326	122,094	134,792
Chaussures orthopédiques sur mesures (moins 10% pour enfant de moins de 12 ans)	Paire	73,256	101,093	109,884	121,312
Chaussures orthopédiques sur moulage	Paire	102,420	141,340	153,630	169,608
Chaussures orthopédiques sur moulage (moins 10% pour enfant de moins de 12 ans)	Paire	92,178	127,206	138,267	152,647
PROTHESES					
Prothèses du membre inférieur					
Prothèses du pied					
Prothèse de Lisfranc ou de Chopart en polypropylène	Pièce	64,840	89,479	97,260	107,375
Prothèse de Lisfranc ou de Chopart en résine	Pièce	70,103	96,742	105,155	116,091
Prothèse de Syme ou de Pirogoff en polypropylène	Pièce	100,249	138,344	150,374	166,012
Prothèse de Syme ou de Pirogoff en résine	Pièce	122,834	169,511	184,251	203,413
Prothèses trans tibiales					
Prothèse trans tibiale endosquelettique en polypropylène(CICR)	Pièce	182,568	251,944	273,852	302,333
Prothèse trans tibiale classique endosquelettique en polypropylène	Pièce	231,504	319,476	347,256	383,371
Prothèse trans tibiale endosquelettique en résine avec pied prothétique Sach (Otto bock)	Pièce	322,829	445,504	484,244	534,605
Prothèse trans tibiale classique exosquelettique en polypropylène (CICR)	Pièce	278,117	383,801	417,176	460,562
Prothèse trans tibiale exosquelettique en résine avec pied prothétique Sach (OttoBock)	Pièce	211,498	291,867	317,247	350,241
Prothèse trans tibiale classique exosquelettique en résine avec pied prothétique Sach(OttoBock)	Pièce	321,687	443,928	482,531	532,714
Prothèses de désarticulation du genou					
Prothèse de désarticulation du genou endosquelettique en polypropylène(CICR)	Pièce	309,487	427,092	464,231	512,510
Prothèse de désarticulation du genou exosquelettique en résine avec pied prothétique Sach(OttoBock)	Pièce	380,624	525,261	570,936	630,313
Prothèse Transfemorale					
Prothèse trans fémorale endosquelettique en polypropylène (CICR)	Pièce	458,983	633,397	688,475	760,076
Prothèse trans fémorale contact endosquelettique en résine avec genou à verrou & pied prothétique Sach (OttoBock)	Pièce	672,887	928,584	1,009,331	1,114,301
Prothèse trans fémorale contact exosquelettique en résine avec genou monoaxial & pied prothétique Sach	Pièce	491,581	678,382	737,372	814,058

Prothèses de hanche					
Prothèse de désarticulation de hanche en polypropylène(CICR)	Pièce	791,894	1,092,814	1,187,841	1,311,376
Prothèse de désarticulation de hanche en résine genou monoaxial et pied sach (Ottobock)	Pièce	1,286,514	1,775,389	1,929,771	2,130,467
Prothèses du membre supérieur					
Prothèses de désarticulation du poignet					
Prothèse esthétique de désarticulation du poignet en polypropylène(CICR)	Pièce	80,076	110,505	120,114	132,606
Prothèse mécanique de désarticulation du poignet en polypropylène avec pince crochet	Pièce	480,956	663,719	721,434	796,463
Prothèse esthétique de désarticulation du poignet en résine(Ottobock)	Pièce	2,110,535	2,912,538	3,165,803	3,495,046
Prothèse mécanique de désarticulation du poignet en résine(Ottobock)	Pièce	3,453,906	4,766,390	5,180,859	5,719,668
Prothèse mécanique de désarticulation du poignet en résine avec crochet pince(Ottobock)	Pièce	480,956	663,719	721,434	796,463
Prothèses d'avant bras / trans radiale					
Prothèse esthétique d'avant bras / trans radiale en polypropylène (CICR)	Pièce	116,010	160,094	174,015	192,113
Prothèse mécanique d'avant bras / trans radiale en polypropylène avec pince crochet ou anneau (CICR)	Pièce	252,970	349,099	379,455	418,918
Prothèse esthétique d'avant bras / trans radiale en résine(Ottobock)	Pièce	2,110,535	2,912,538	3,165,803	3,495,046
Prothèse mécanique d'avant bras / trans radiale en résine(Ottobock)	Pièce	3,453,906	4,766,390	5,180,859	5,719,668
Prothèses de bras / trans humérale					
Prothèse esthétique de bras / trans humérale en polypropylène(CICR)	Pièce	212,780	293,636	319,170	352,364
Prothèse mécanique de bras / trans humérale en résine(Ottobock)	Pièce	2,922,816	4,033,486	4,384,224	4,840,183

Kigali, le 21 DEC 2016

Dr Diane GASHUMBA
 Ministre de la Santé

