J Rehabil Med 2015; 47: 809–815

SPECIAL REPORT

ISPRM DISCUSSION PAPER: PROPOSING DIMENSIONS FOR AN INTERNATIONAL CLASSIFICATION SYSTEM FOR SERVICE ORGANIZATION IN HEALTH-RELATED REHABILITATION

Christoph Gutenbrunner, MD, PhD[1], Jerome Bickenbach, LLB, PhD[2,3], Carlotte Kiekens, MD[4], Thorsten Meyer, PhD[5], Dimitrios Skempes, PT, MPH[2,3], Boya Nugraha, MS, PhD[1], Matthias Bethge, MS, PhD[6] and Gerold Stucki, MD, PhD[2,3]

From the [1]Department of Rehabilitation Medicine, Hannover Medical School, Hannover, Germany, [2]Swiss Paraplegic Research, Nottwil, [3]Department of Health Sciences and Health Policy, University of Lucerne, Lucerne, Switzerland, [4]Physical and Rehabilitation Medicine, University Hospitals Leuven, Leuven, Belgium, [5]Integrative Rehabilitation Research Unit, Institute for Epidemiology, Social Medicine and Health Systems Research, Hannover Medical School and [6]Institute of Social Medicine and Epidemiology, University of Lübeck, Lübeck, Germany

Objective: **Rehabilitation is one of 4 main health strategies. The World Report on Disability identifies deficits in rehabilitation care for people with disabilities as an important barrier to full inclusion in society or to achieve optimal functioning. In order to overcome such deficits, to close gaps in national and/or regional rehabilitation systems, and to develop appropriate rehabilitation services, it is crucial to define uniform criteria and a widely accepted language to describe and classify rehabilitation services. The aim of this paper was therefore to develop a list of dimensions and categories to describe the organization of health-related rehabilitation services.**

Methods: **The classification is based on a series of expert workshops including members of the International and European Society of Physical Medicine and Rehabilitation.**

Results: **The proposed classification has 2 levels (dimensions and categories). The upper level distinguishes 3 dimensions: the service provider (with 9 categories), the funding of the service (with 3 categories), and the service delivery (8 subcategories). A further specification of the categories in a 3-level classification (including value sets) is needed.**

Conclusion: **This paper is an intermediate step towards development of a classification system with distinct categories and dimensions.**

Key words: health-related rehabilitation; service organization; classification system; dimensions; categories.

J Rehabil Med 2015; 47: 809–815

Correspondence address: Christoph Gutenbrunner, Department of Rehabilitation Medicine, Coordination Centre for Rehabilitation Research, Hannover Medical School, Carl-Neuberg-Str. 1, DE-30625 Hannover, Germany. E-mail: gutenbrunner.christoph@mh-hannover.de

Accepted Jun 10, 2015; Epub ahead of print Sep 7, 2015

INTRODUCTION

Rehabilitation can be understood as one of 4 main health strategies (1–3). It aims at enabling persons experiencing disability to achieve optimal functioning (4). Thus, it is one of the most important tools for overcoming disability in persons with health conditions, such as congenital deformities, chronic diseases or trauma (5). In this context, disability may be defined as the result of an interaction between the person with a health condition and his or her environment (5, 6). Thus rehabilitation must aim both at empowering persons experiencing disability to enhance their level of activity and participation, and at removing barriers from the environment (4). Physical and Rehabilitation Medicine integrates medical interventions to improve body functions and activities and actions to overcome environmental barriers, e.g. providing assistive technology or advising employers to create a supportive work environment (7).

The World Report on Disability (WRD) (5) identifies deficits in rehabilitation care for people with disabilities as an important barrier to full inclusion into society. On the other hand, the report demonstrates that good rehabilitation services can help significantly to enable participation. Consequently the WRD states "the priority is to ensure access to appropriate, timely, affordable, and high-quality rehabilitation interventions, (…) for all those who need them" (5). For stakeholders the report claims that:

- "Governments should develop, implement, and monitor policies, regulatory mechanisms, and standards for rehabilitation services, as well as promoting equal access to those services.
- Service providers should provide the highest quality of rehabilitation services.
- Other stakeholders (users, professional organizations, etc.) should increase awareness, participate in policy development, and monitor implementation.
- International cooperation can help share good and promising practices and provide technical assistance to countries that are introducing and expanding rehabilitation services." (5).

And, very concretely, the WRD states that "plans should be based on analysis of the current situation, consider the main aspects of rehabilitation provision – leadership, financing, information, service delivery, products and technologies, and the rehabilitation workforce" (5). This assumes that there are

 doi: 10.2340/16501977-2002

 ISSN 1650-1977

tools to analyse the provision of rehabilitation services and to identify gaps in relation to the needs of persons with disabilities. Other related points are the improvement in funding and the enhancement of the rehabilitation workforce (8).

In order to overcome deficits and to close gaps in national and/or regional rehabilitation systems, as well as to build up appropriate rehabilitation services, it is crucial to define uniform criteria and widely accepted language to describe and classify rehabilitation services. For international comparisons such a classification must be accepted internationally. It must be feasible and applicable in different world regions and cultures. Such a classification for rehabilitation service organization has not yet been developed.

There are, however, several classifications within the health system that have been published at national and international levels that make some reference to the description of health-related rehabilitation services. The most relevant are:

- the International Classification of Health Accounts (ICHA) (3),
- the International Classification of Health Interventions (ICHI) (9), and
- the International Standard Classification of Health Occupations (ISCO-08) (10).

Certainly, classifications for diseases and the functioning of patients are of also major relevance, especially:

- the International Classification of Diseases (ICD-10) (11) and
- the International Classification of Functioning, Disability and Health (ICF) (6).

Many aspects of the classifications listed above are useful in many different ways, e.g. to describe rehabilitation services. However, due to the specific goals and methods of these classifications, there is a need to adapt their items and to combine them in a new system that covers all aspects of rehabilitation service organization.

Recently, Meyer et al. (12) published a conceptual description of health-related rehabilitation services, describing them as "personal and non-personal intangible products provided to persons with a health condition experiencing or likely to experience disability or to their informal care-givers within an organisational setting (…) addressing individual functioning needs (…) delivered by rehabilitation professionals, other health professionals, or appropriately trained community-based workers." This description implies that rehabilitation services are, on the one hand, characterized by their goals, but, on the other hand, can be described by their organizational setting, including technical and human resources.

The aim of this paper is to develop a list of dimensions and categories to describe the organization of health-related rehabilitation services. The classification starts from the above-mentioned definition of a rehabilitation service, as given by Meyer et al. (12). It will take into account existing descriptions of health-related rehabilitation services at national and regional levels (13, 14) and criteria being used to compare specific types of health-related rehabilitation services (15, 16).

This paper is intended as an initial proposal for further discussion and consensus by experts from all International Society of Physical and Rehabilitation Medicine (ISPRM) areas and subareas (17).

METHODS AND CLASSIFICATION PRINCIPLES

The dimensions and categories described here were developed in working groups of the "Strengthening Medical Rehabilitation Subcommittee" within the "WHO Liaison Committee" of ISPRM and Public Health Committee within ESPRM. These working groups have specific expertise in Physical and Rehabilitation Medicine, and Rehabilitation, and Public Health Research. The process was continued in a total of 6 2-day workshops with intermediate literature search and reflections in between the meetings.

In the first meeting the following principles were agreed:

- In order to make the classification feasible for use, it should be as short as possible. The dimensions and categories should be clearly defined and easy to understand. The categories should be distinctive. However, some dimensions might be associated with others (e.g. long-term services will more often be associated with maintenance as the main health strategy, and multi-professional team structure will more often be associated with a higher intensity of care interventions). However, the selection of dimensions and categories aimed to avoid overlaps.
- For the definition of categories other internationally recognized classifications were available. This is the case for the classification of providers, which can use many of the dimensions of the ICHA-HC (3) and the classification of health professionals, which refers to the ISCO-08 (10). The proposed classification also refers to the ICHI (9).
- Regarding the use of terms and their application in dimensions and categories, either term with clear and commonly accepted definitions should be used. For other terms explanations should be provided or published descriptions should be cited (e.g. health strategies; 1, 3). Last, but not least, terms are taken from more specialized literature and used in the most common way (e.g. "human resources" is used for "staffing").
- Conceptually, a 3-level classification was aimed at. It should include dimensions, categories, and value sets. In order to perform a stepwise approach, the working group decided at this stage to propose only a 2-level approach. This can ensure an early debate and consensus process as a sound basis for the development of value sets.

In the literature, the term "rehabilitation service" is not used uniformly (12). Sometimes it is used for the offer of a set of interventions applied to a target group and seen as the treatment process. Other authors, e.g. Meyer et al. (12), have used it as an organizational term related to the setting or organization that provides rehabilitation measures. In this paper we use the term in the latter sense. This also refers to the conceptual description of rehabilitation as a health strategy (4). Furthermore, it is in line with the World Health Organization (WHO)'s definition of rehabilitation as "a set of measures that assist individuals who experience, or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments".

The dimensions and categories aim to describe rehabilitation services, as defined by Meyer et al. (12), at the meso level. However, some overlap with the macro level (health policy and health system) and the micro level (programmes, interventions, patients) may occur (Fig. 1).

The proposed classification is not a measurement tool in itself. The dimensions at the present stage are still at a conceptual level. Thus, another step is needed to define value sets and measurement tools, and their application.

Classification dimensions

At this point the classification consists of 2 levels:

- Level 1: Dimensions
- Level 2: Categories

A third level with value sets may be added at a later stage of development.

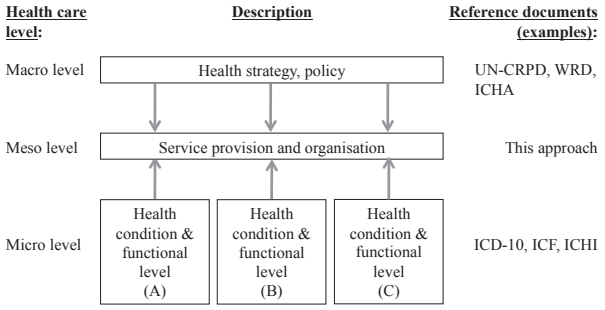

Fig. 1. Healthcare levels and reference documents. UN-CRPD: UN-Convention for the Rights of People with Disabilities; WRD: World Report on Disability; ICHA: International Classification of Health Accounts; ICD-10: International Classification of Diseases 2010; ICF: International Classification of Functioning, Disability and Health; ICHI: International Classification of Health Interventions.

The dimensions consist of 3 main characteristics of service organization. Level 1 distinguishes between 3 dimensions:

1. Service provider: the categories to describe the provider include the framework of the institution (location, organization, etc.) the resources (human and technical resources) and some aspects of service organization, such as profit-orientation and quality-assurance programmes. These categories respond to questions concerning where, by whom, and in which context the service is delivered.
2. Funding of the service: the categories of funding describe the main sources of income and refunding of services. They include the basic principles of payment, such as diagnosis-related groups, per-day payment or other forms of service refund. The underlying question here is what are the principles of founding a service.
3. Service delivery: the categories for service delivery contain the main strategy applied to the users, aspects of intensity and duration of intervention and the way the service is organized (e.g. team structure). It focuses on the question what, for what, and how the services are delivered to the user.

These 3 dimensions are categorized in the level 2 classification. It contains the following categories, with some examples in parentheses:

1. Provider

- 1.1 Location (centralized vs. decentralized service, situated in rural area vs. urban area, accessibility (transport systems and others) and other dimensions of location).
- 1.2 Organization (independent organization, affiliation, or other dimensions of organization).
- 1.3 Context (single practise, community-based service, institutional care, such as nursing home or hospital-based service, home-based or other dimensions of context).
- 1.4 Facility (building, hotel service and other aspects of facility).
- 1.5 Human resources (health professionals, administrative staff, technical staff, and other personnel).
- 1.6 Technical resources and equipment (diagnostic devices, therapeutic devices and treatment modalities, data procession and communication, and other technical resources).
- 1.7 Quality assurance (total quality assurance system, single quality assurance measures and other methods of quality assurance).
- 1.8 Profit-orientation (profit-oriented, non-profit organization as charity organization and others, and other aspects of profit-orientation).
- 1.9 Other categories of provider.

2. Funding

- 2.1 Source of money (health insurances, pension insurances, accident insurance or other insurances, social welfare system, private payment, e.g. out-of-pocket payment, founds, or other sources of money).
- 2.2 Criteria of cost refund (Diagnosis related group-system, day-based payment, or other systems).
- 2.3 Other criteria of funding.

3. Service delivery

- 3.1 Strategy (prevention (preventive strategy), therapy (curative strategy), rehabilitation (rehabilitation strategy), maintenance (supportive strategy), or other health strategies).
- 3.2 Target groups (e.g. patients with defined health conditions, persons with specific deficits in body functions, activities and participation, case mix index and other target groups).
- 3.3 Service goals (restitutio ad integrum, improvement of health status, improvement of self-care, return to normal life, return-to-work, or other service goals).
- 3.4 Aspects of time (phase of disease (acute phase, post-acute phase, long-term phase), time-frame of intervention (short-term intervention, long-term intervention, intermittent interventions), number and duration of treatment time per day, and other aspects of time).
- 3.5 Intensity (high, medium or low itensity or other dimensions of intensity).
- 3.6 Team structure (involved professions, team organization (e.g. multidisciplinary team, interdisciplinary team), or other dimensions of team structure).
- 3.7 Mode of production (hospitalization, inpatient service, day clinic, outpatient service or other modes of production).
- 3.8 Other categories of service delivery.

If education and training are part of service provision (e.g. in university hospital), students and trainers could be classified as target groups (point 3.2) and education and training as service goals (point 3.3). Consequently, trainers should be included in human resources (point 1.5). The same principle applies to scientific programme and research (see Table I).

As mentioned above, a further specification of the categories in a 3-level classification is needed. Such value sets should be suitable for describing the categories; however, they are not intended to provide parameters or value sets to measure the categories.

DISCUSSION

This paper offers a proposal for the dimensions and categories required to describe and compare service organization in health-related rehabilitation services at the regional, national and international level. The classification includes 3 dimensions, comprising a total of 20 categories. These categories should be described by values sets that have not been defined previously. Such value sets could further specify the categories in the following way:

- The location of a service could be characterized by value sets as centralized vs. decentralized services, the situation in a rural or an urban area or accessibility (e.g. by public transport).
- The aspects of time in the service delivery could be specified by the phase of disease (acute, post-acute or long-term) and the time-frame of interventions (short-term vs. long-term, intermittent applications, hours of interventions per day, etc.).
- The team structure could be described by the health professionals involved and the way the team is organized (multi- vs. interdisciplinary or other team structure).

The proposed classification on 2 levels is comprehensive and has the potential to be used as a basis for the development of a distinct classification system.

Table I. *Application of the dimensions and categories of the 2-level classification to the selected rehabilitation services*

Number	Dimension and category	Rehabilitation service A	Rehabilitation service B	Rehabilitation service C	Rehabilitation service D
Type		University department	Inpatient and outpatient rehabilitation service	Inpatient and outpatient rehabilitation service	Community-based rehabilitation service
Name, place		Department for Rehabilitation Medicine, Hannover Medical School, Hannover, Germany	Department for Rehabilitation Medicine, Fatmawati, Jakarta, Indonesia	Saint Joseph's Children and Adult Home, Mambu, Bafut, NWR, Cameroon	Functional rehabilitation programme for achieving independence and autonomy in the community, Medellin, Colombia
1.	*Provider*				
1.1.	Location	City	City	Village	Poor neighbourhoods in a city
1.2.	Organization	Public	Public/government hospital	Private	Non-governmental
1.3.	Context	University hospital	General hospital	Rehabilitation centre	City neighbourhoods
1.4.	Facility	Rehabilitation department	Rehabilitation department for outpatient and inpatient ward, orthotic and prosthetic workshop and wheelchair workshop	Rehabilitation department with vocational training, orthopaedic workshop, Infirmary, shoe-making works, embroidery workshop, cane workshop, bakery and the resource room for the visually impaired	Community centres and homes
1.5.	Human resources	Multiprofessional team: physicians, physiotherapists, occupational therapists, dysphagia therapists, sport therapist, researchers	Multiprofessional team: PRM specialists, physiotherapists, occupational therapists, speech therapist, prosthetics and orthotics, social workers, nurse, psychologists	Physical therapists, orthopaedic technicians, prosthetic technicians, special education teachers, technical workers	Interdisciplinary team: physiotherapists, psychologists, social workers, special trainer, sign language interpreter, sign language teacher (hearing impaired)
1.6.	Technical resources	Physical medicine devices, medical training, gymnasium, pool, laboratory diagnostics, functional assessment	Physical medicine devices, training gymnasium, pool, workshop for prosthetics and orthotics and wheel chairs	Gymnasium, mechanical electrical and gait devices. Workshop for the production of wheelchairs and tricycles, cane devices, beads and bangles, shoes	Not required
1.7.	Quality assurance	Single quality assurance measures	Single quality assurance measures	No feedback with the patient	Single quality assurance measures and feedback with the community
1.8.	Profit-orientation	Non-profit	Non-profit	Non-profit	Non-profit
1.9.	Other categories	Teaching hospital	Affiliation teaching hospital for PRM residence (education to become PRM specialist), practical ground for physiotherapists, occupational therapists, psychologist	Rehabilitation services and practical ground for physiotherapists, occupational therapists and special education teachers for internship	Education and training services for people with disabilities
2.	*Funding*				
2.1.	Source of money	Public, health insurance	Public, mostly government insurance	Patients, well-wishers and non-governmental organizations	Special public resources of the Medellin township called "participatory budgeting" whose destination is defined by the boards of the involved communities
2.2.	Criteria of cost refund	Budget, internal settlement with other department, health insurance	Budget and government health insurance	No refund from the government	Budget

Table I. *Condt.*

2.3.	Other categories	Research grants	Donations	Donations	Social fund resources (institutional fund for payment of services not included in the programme)
3.	*Service delivery*				
3.1.	Strategy	Rehabilitation, therapy, maintenance	Rehabilitation, maintenance and prevention	Rehabilitation and vocational training	Group work for instruction in achieving independence and autonomy in activities of daily living, teaching sign language and Braille, field work with disabled people in different areas of the city
3.2.	Target groups	Patients with a wide range of acute and chronic health conditions (predominantly musculoskeletal, neurological incontinence and postoperative) as well as all inpatients of the university hospital	Patients with a wide range of acute and chronic conditions (musculoskeletal, neurological, spinal cord injury, bladder dysfunction, pediatric, geriatric), preventive rehabilitation (club of exercise activity for diabetic, heart and lung, stroke, osteoporosis and geriatric patients)	Patients referred from higher levels of complexity to lower levels. Patients who do not have access to more comprehensive rehabilitation services	Patients referred from higher levels of complexity to lower levels Patients who do not have access to more comprehensive rehabilitation services
3.3.	Service goals	Improvement in health condition and functioning of inpatients, rehabilitation of outpatients; research, training	Preventing disability and improvement functioning of inpatient and rehabilitation of outpatient to achieve independency and quality of life	Prevent, improve and restore function with mobility training in order to restore dignity, and improve living standards of those with physical and visual impairment in our society.	Improved levels of independence and autonomy in activities of daily living and participation in different areas of the city
3.4.	Aspects of time	Acute; post-acute; long-term. Inpatients: length of stay in acute ward (days to weeks); Outpatients: 2 weeks to 6 months	Inpatients: weeks to months for spinal cord injury patients; and days to weeks for patients who need intensive rehabilitation (e.g. stroke patients) Outpatients: 2 weeks to 6 months	Post-acute; long-term; and long life time for specific cases (e.g. cerebral palsy, post-polio, and spinal cord injury)	Each programme has a duration of 6 months
3.5.	Intensity	Inpatients: high intensity; outpatients: low intensity	Inpatients: high intensity; outpatients: low intensity	Inpatients: high intensity; outpatients: low intensity	Low-intensity intervention by health professionals Plans are provided for training at home
3.6.	Team structure	Multiprofessional	Multiprofessional	Multiprofessional	Multiprofessional
3.7.	Mode of production	Inpatient and outpatient	Inpatient and outpatient	Inpatient and outpatient	Only outpatient services in the community
3.8.	Other categories	Scientific research	Collaboration with prosthetics and orthotics school	Collaborative benefits with other institutions	Training programmes for people with disabilities and community leaders

PRM: Physical and Rehabilitation Medicine.

According to the WHO (18) key components of a health system are governance and information, in addition to financing, human resources, products, technologies, and service delivery. These components have some overlap with the proposed classification; however, they also show some overlap between the macro and meso levels of healthcare (see 12).

As with other classification systems, there are some implicit problems with our proposal: first, the dimensions have been developed in only a small group of experts. Secondly, overlap or interaction of dimensions could not been totally excluded. Thus, the categories may not be strictly mutual exclusive, although the degree of overlap or interaction was judged acceptable by the working group. The leading principle was the applicability of the concept. Thirdly, the development of the classification in a group of European experts may limit its application in other world regions and different cultural and society contexts. This has been, at least partly, compensated, as experts from South America, Sub-Saharan Africa, South East Asia and Europe tested its feasibility by applying it to characterize existing rehabilitation services (see below).

Papers on the taxonomy or classification of specialized rehabilitation services have been published previously. For example, Hoenig et al. (19) published a taxonomy of relevant variables derived from a Delphi process among rehabilitation experts. They identified the following main categories:

- Personnel including staffing intensity and graduation.
- Physical facilities, such as adaptive environment and treatment equipment.
- Coordination of care, e.g. team meetings and therapists' reporting.
- Hospital-level descriptors, including volume of care, availability of treatments at weekend or distance from home of the patients.

Interestingly, financing is not part of their list of characteristics, probably due to the fact that the survey was carried out in a region with a uniform payment structure. However, economic pressure underlines the need for a transparent description of financial sources and costs required to meet patients' needs and to achieve the intended outcomes (13).

From a regional perspective Graham et al. (14) identified a set of parameters to describe rehabilitation services using a mixed methods approach. They aimed at an international comparison between standards in Australia and New Zealand with those in the UK and USA. They identified the following issues that were best covered in the investigated standards:

- Policies and procedures, management of patient records.
- Facilities and equipment.
- General staffing, staffing establishment, the rehabilitation team.
- Service provision, referral and assessment, start of rehabilitation, assessment and rehabilitation programme planning, rehabilitation programme and co-ordination of rehabilitation process, discharge, liaison with other healthcare facilities.
- Quality activities, improving performance, continuing education, staff development, audit and training.
- Comprehensive inpatient rehabilitation programmes.

Comparing these items with our proposal, number 1 is partly included in the dimension of the provider, number 2 coincides with our number 1.6 (technical equipment), number 3 is similar to our number 1.5 (human resources) and covers aspects of number 3.6 (team structure). Number 4 is related to some aspects of our third dimension (service delivery). Numbers 5 and 6 are related to interventions that are not part of the service classification but fit into the ICHI classification (9).

The list of dimensions and categories of rehabilitation services is comprehensive and covers a wide variety of aspects. However, it contains aspects from the micro-level of service delivery, such as rehabilitation programmes and diagnoses. Thus, it cannot be directly compared with our approach, although it can be used to redefine our categories.

Referring to the cited references, Table I shows an example of the dimensions and categories for 4 existing rehabilitation services without going to the level of value sets. Even this level of specification can provide a distinct picture of the services described and identifies differences in service organization. Table I also shows that, at this level of specification, the choice of criteria used to describe the rehabilitation service is variable. Thus, for scientific studies and for practical use, the development of value sets will be necessary.

Another example of the use of dimensions and components of rehabilitation services for the comparison of rehabilitation services is the assessment of human resources of the rehabilitation workforce (14). It shows that this parameter is feasible for international comparisons; however, it also shows that there may be gaps in the provision of value-sets (e.g. the ISCO code is lacking a clear definition of rehabilitation physicians). Another example is the comparison of rehabilitation services with the purpose of comparing health outcomes. Hoenig and colleagues used their taxonomy for stroke rehabilitation services, as described above, and showed that their classification system can be used to identify service factors associated with rehabilitation outcomes (15). In more detail, they identified specific organizational factors that were independently associated with differences in stroke patient outcomes, after controlling for patient characteristics, e.g. a greater availability of nursing personnel was associated with a slightly shorter length of stay.

The next step towards a broader consensus of this draft classification is a worldwide discussion with other experts in rehabilitation and health classifications; comments to the authors are therefore welcomed. After taking these comments into consideration, the working group will produce a revised version that then will be discussed and approved within the ISPRM. In parallel, some preliminary testing should be done, such as:

- Using it to describe and distinct services within distinguish countries (so-called use cases).
- To compare (or distinguish) rehabilitation services across countries and continents.

In addition, value sets should be defined and measurement systems or scales developed. A project should be performed to link the dimensions of this classification to other classifications and definitions in matrices (e.g. health strategies and

PRM services). Finally it is hoped that the classification will be used to compare rehabilitation services worldwide and to identify gaps in rehabilitation systems, as called for by the World Report on Disability (5).

ACKNOWLEDGEMENTS

The authors would like to thank Dr Ngaibe Victorine from Saint Joseph's Children and Adult Home, Mambu, Bafut, NWR, Cameroon; Peni Kusumastuti, MD, SpRM, from the Department for Rehabilitation Medicine, Fatmawati, Jakarta, Indonesia; and Professor Luz Helena Lugo, MD, from Grupo de Rehabilitacion en Salud, Universidad de Antioquia, who provided information for Table I.

The author declare no conflicts of interest.

REFERENCES

1. Stucki G, Cieza A, Melvin J. The International Classification of Functioning, Disability and Health: a unifying model for the conceptual description of the rehabilitation strategy. J Rehabil Med 2007; 39: 279–285.
2. Gutenbrunner C, Meyer T, Stucki G. The field of competence in physical and rehabilitation medicine in light of health classifications – an international perspective (invited commentary). Am J Phys Med Rehabil 2011; 90: 521–525.
3. Organisation for Economic Co-operation and Development, European Union, World Health Organization. A system of health accounts. 2011 Edition [cited 2015 Aug 25]. Available from: http://www.who.int/health-accounts/methodology/sha2011.pdf.
4. Meyer T, Gutenbrunner C, Bickenbach J, Cieza A, Melvin J, Stucki G. Towards a conceptual description of rehabilitation as health strategy. J Rehabil Med 2011; 43: 765–769.
5. World Health Organization & World Bank. World report on disability. Geneva: WHO; 2011.
6. World Health Organization. International Classification of Functioning, Disability and Health: ICF. Geneva: WHO; 2001.
7. Gutenbrunner C, Meyer T, Melvin J, Stucki G. Towards a conceptual description of Physical and Rehabilitation Medicine. J Rehabil Med 2011; 43: 760–764.
8. Gutenbrunner C, Bethge M, Stucki G, Li J, Lains J, Olver J, et al. Dissemination, Analysis and Implementation of the World Report on Disability. Am J Phys Med Rehabil 2014; 93 (Supplement): S68–S72.
9. World Health Organisation. International Classification of Health Interventions (ICHI), under development. 2013 [cited 2015 Aug 25]. Available from: www.who.int/classifications/ichi/en/.
10. International Labour Office. Draft classification structure – ISCO-08. Including Annex 1 for updating ISCO-88 into ISCO-08. Geneva: International Labour Office; 2006.
11. World Health Organization. International Statistical Classification of Diseases and Related Health Problems: ICD, 10th revision. Geneva: WHO; 2010.
12. Meyer T, Gutenbrunner C, Kiekens C, Skempes D, Melvin JL, Schedler K, et al. ISPRM – discussion paper: proposing a conceptual framework of rehabilitation services from an organisational perspective. J Rehabil Med 2014; 46: 1–6.
13. Turner-Stokes L. Politics, policy and payment – facilitators or barriers to person-centered rehabilitation? Disabil Rehab 2001; 29: 1575–1582.
14. Graham SK, Cameron ID, Dickson HG. Analysis of draft Australian rehabilitation service standards: comparison with international standards. Australia and New Zealand Health Policy 2008; 5: 15–23.
15. Hoenig H, Sloane R, Horner RD, Zolkewitz M, Reker D. Differences in rehabilitation services and outcomes among stroke patients cared for in veterans hospitals. Health Services Res 2001; 35: 1293–1318.
16. Gupta N, Castillo-Laborde C, Landry MD: Health-related rehabilitation services: assessing the global supply of and need for human resources. BMC Health Services Res 2011; 11: 276–287.
17. Imamura M, Gutenbrunner C, Li J, Lains J, Frontera W, Olver J, et al. Guest Editorial: 2012 – an ISPRM Landmark Year. J Rehabil Med 2013; 45: 417–422.
18. World Health Organization. Key components of a well functioning health system. Geneva: WHO; 2010.
19. Hoenig H, Sloane R, Horner RD, Zolkewitz M, Duncan PW, Hamilton BB. A taxonomy for classification of stroke rehabilitation services. Arch Phys Med Rehabil 2000; 81: 853–863.