

## ORIGINAL REPORT

## CHARACTERIZING THE SERVICES OF A REHABILITATION CENTRE SPECIALIZED IN SPINAL CORD INJURY/DISORDER USING THE INTERNATIONAL CLASSIFICATION OF SERVICE ORGANIZATION IN REHABILITATION 2.0 AND IMPLICATIONS FOR HEALTH REPORTING: A DEMONSTRATION PROJECT

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**Objectives:** To characterize the services of a rehabilitation centre specialized in spinal cord injury/disorder (SCI/D) using the International Classification of Service Organization in Rehabilitation (ICSO-R) 2.0, and to evaluate its potential use in meeting health reporting and certification requirements.

**Methods:** The post-acute and outpatient rehabilitation services at this specialized SCI/D centre were described, the SCI/D Framework of rehabilitation service type definitions considered, various rehabilitation centre stakeholders were consulted, and data were collected using the centre's digital quality management system and institutional management tool. A structured internet search identified the national health reporting and certification systems relevant for SCI/D rehabilitation. The resulting systems were subsequently mapped with ICSO-R 2.0 categories.

**Results:** ICSO-R 2.0 categories pertaining to the provider dimension were generally the same across the post-acute and outpatient services. ICSO-R 2.0 highlighted the nuances in service delivery between these 2 service types. Most of the categories could be mapped to at least 1 of the 10 health reporting and certification systems detected in the website search.

**Conclusion:** ICSO-R 2.0 can be used to comprehensively describe the rehabilitation services of a specialized SCI/D centre in Switzerland. Despite some challenges, ICSO-R 2.0 has the potential to facilitate national health reporting and certification.

**Key words:** rehabilitation; International Classification of Functioning, Disability and Health; spinal cord injury; evidence-based practice; health services research.

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### LAY ABSTRACT

The International Classification of Service Organization in Rehabilitation (ICSO-R) 2.0 has been developed to characterize rehabilitation services in different fields of rehabilitation. The aim of this study was to characterize different rehabilitation services in a centre specialized in spinal cord injury and disorder. Out of 9 rehabilitation services detected, post-acute and outpatient services were described. ICSO-R 2.0 highlighted the nuances in service delivery between these 2 service types. Most of the categories could be mapped to at least 1 of the 10 health reporting and certification systems detected in the website search. Despite some challenges, ICSO-R 2.0 has the potential to facilitate national health reporting and certification.

### Global standards for rehabilitation

In response to the World Health Organization's (WHO's) Rehabilitation 2030 call for action (1), various projects to strengthen rehabilitation have been initiated worldwide (2, 3). For example, the physical and rehabilitation medicine (PRM) Section and Board of the European Union of Medical Specialists (UEMS) has been implementing an action plan (4) that includes the development of standards, such as the European Framework of rehabilitation service types (termed "European Framework" throughout this paper) (5) and corresponding clinical assessment schedules (6). In parallel, the International Classification of Service Organization in Rehabilitation (ICSO-R) 2.0 was developed under the auspices of the International Society of PRM (ISPRM) (7–9). ICSO-R 2.0 was developed to provide a standard for systematically describing rehabilitation services that would support rehabilitation service assessments, highlight service gaps and inform local and national level quality improvement action plans as well as facilitate the comparison of rehabilitation services at the national level (9). Recognizing the value of ICSO-R 2.0, it was also included in the UEMS-PRM International Clas-

sification of Functioning, Disability and Health (ICF) action plan (4). There is also potential value of using ICSO-R 2.0 in rehabilitation quality management, specifically in supporting national health reporting and certification.

#### *Rehabilitation quality management in Switzerland*

In Switzerland, rehabilitation quality management is driven by the national reporting of functioning requirements of the National Association for Quality Development in Hospitals and Clinics (ANQ) (10) as well as by diverse certification programmes, such as that of SWISS REHA, the association of leading rehabilitation clinics in Switzerland (11). Furthermore, cantonal (state) health departments (GDK) define quality criteria and publish a list of hospitals, including rehabilitation hospitals, which are certified to provide healthcare services and receive payment for service provision. Also, a driver of rehabilitation quality management in Switzerland is the quality criteria DefReha 3.0 (H1+ DefReha 3.0 brochure on website (12)) for inpatient rehabilitation. Similar to the internationally applicable ICSO-R 2.0, DefReha 3.0 describes personnel, infrastructure and process requirements for rehabilitation care provision in Switzerland, but in narrative form. DefReha 3.0 additionally identifies the basic services inpatient rehabilitation must provide irrespective of rehabilitation service type (5, 13).

#### *Rehabilitation quality management for spinal cord injury/disorder in Switzerland*

While SCI/D is one of several specializations for which quality criteria are outlined in Def Reha 3.0 (H1+ DefReha 3.0 brochure on website (12)), the Swiss Society of Paraplegia (SSoP) has established quality and performance criteria specifically for rehabilitation services for persons with SCI/D. This criteria catalogue encompasses 4 areas: indication, structure, process, and outcome quality (SSoP, 2018; brochure on website (14)). The national reporting requirements of ANQ on functioning and of GDK on institutional structural data also apply to SCI/D rehabilitation.

To facilitate rehabilitation quality management for SCI/D across the care continuum in Switzerland, efforts have been made to develop a counterpart of the aforementioned global standards specifically for Switzerland and SCI/D (15). For example, the Framework of rehabilitation service types specifically developed for spinal cord injury/disorder (SCI/D) in Switzerland (“SCI/D Framework” from now on) (13) is now available as a counterpart to the European Framework (5). They are similar in concept and structure; however, the SCI/D Framework contains

more service types and more granular descriptions. In terms of ICSO-R 2.0, rather than developing a national counterpart, its concrete application to describe a specialized SCI/D rehabilitation centre in Switzerland was deemed more warranted. This would also enable us to explore the real-life utility of ICSO-R 2.0.

Thus, the aim of this project was to characterize an SCI/D specialized centre in Switzerland using the ICSO-R 2.0. A secondary aim is to highlight the potential use of ICSO-R 2.0 to meet reporting and certification requirements.

## MATERIAL AND METHODS

### *ICSO-R 2.0-based description*

To address the first aim, we described 1 of 4 national SCI/D specialized centres in Switzerland (referred to as “SPC” throughout this paper) by completing an Excel-based form created by the UEMS-PRM for ICSO-R 2.0 demonstration projects. The current paper is the first publication of this form. Specifically, we described the SCI/D Framework service types for post-acute rehabilitation (encompassing “Post-acute rehabilitation – Specialized for SCI/D” and “Other specializations”) and for outpatient rehabilitation (encompassing “Outpatient rehabilitation – Specialized for SCI/D”, “Other specializations” and “General”), 5 of 11 rehabilitation service types offered at SPC. See Table I.

The form contains all the elements of ICSO-R 2.0 (dimensions, (sub)categories, inclusions) published by Gutenbrunner and colleagues (9), and additional instructions and specifications were provided to help the user to better understand the elements and to frame the information they should enter in the form. Two separate forms were completed for the post-acute and outpatient rehabilitation services at SPC.

*Setting.* This rehabilitation facility opened in 1990, and currently has 180 inpatient beds and an outpatient

**Table I.** Available service types at SPC (1 of 4 national spinal cord injury/disorder (SCI/D) specialized centres in Switzerland (referred to as “SPC” throughout this paper) according to the Framework of rehabilitation services types for SCI/D in Switzerland (SCI/D Framework)

Rehabilitation service types in Switzerland
1a. Rehabilitation acute care – newly acquired SCI/D
1b. Rehabilitation acute care – chronic SCI/D
2a. Post-acute rehabilitation – specialized for SCI/D rehabilitation
2b. Post-acute rehabilitation – other specializations
4a. Outpatient rehabilitation – specialized for SCI/D rehabilitation
4b. Outpatient rehabilitation – other specializations
4c. Outpatient rehabilitation – general
6a. Vocational rehabilitation in post-acute inpatient and outpatient rehabilitation – specialized for SCI/D
6b. Vocational rehabilitation in inpatient and outpatient care – non-specialized
7. Lifelong follow-up rehabilitation – specialized for SCI/D
8. Rehabilitation for specific groups of persons with SCI/D

clinic. SPC was first certified as a SWISS REHA clinic in 2014, and achieved ISO 9001 certification in 2015. Since then, ISO and SWISS REHA have re-certified SPC every 3 years. The outpatient clinic offers annual follow-up appointments and acute care or rehabilitation for persons with SCI/D or other neurological health conditions. Besides the main facility in the German-speaking part of Switzerland, there are 2 outpatient departments in the French and the Italian-speaking parts of Switzerland.

*Data collection.* To inform the completion of the ICSO-R form, the descriptions of the SCI/D Framework rehabilitation service types offered at SPC were considered. See Table I. Furthermore, the SPC quality management department was consulted, and some data, e.g. concepts and process descriptions, full-time equivalent workload, were collected using SPC's digital quality management system and its institutional management tool. The results were discussed and re-confirmed in individual meetings and via e-mail with the heads of the inpatient and outpatient rehabilitation services, the corporate development group, and the quality management department, as well as with the SPC Director.

#### *Potential utility of ICSO-R 2.0*

To address the second aim, specifically to identify the health reporting and certification systems relevant for SCI/D rehabilitation, a structured internet search was performed with the following key words: "rehabilitation service\*", or "health service\*" or "rehabilitation institution" or "rehabilitation organization" or "hospital" or "clinic" and "statistics" or "reporting" or "monitoring" or "data\*" and "Switzerland" or "Swiss". The same key words were used to explore the websites of the Swiss Federal Statistical Office ([www.bfs.admin.ch](http://www.bfs.admin.ch)) and the Federal Office of Public Health ([www.bag.admin.ch](http://www.bag.admin.ch)) and the Swiss Health Observatory (Obsan; [www.obsan.admin.ch](http://www.obsan.admin.ch)), a service and information centre supported by the Swiss Federal and cantonal governments responsible for the scientific analyses of population health and healthcare system data. To ensure the comprehensiveness of the findings, the quality management department head was asked to check them. Lastly, the ICSO-R 2.0 was mapped category-by-category with the resulting Swiss health reporting and certification systems.

## RESULTS

### *ICSO-R 2.0-based description*

Supplementary Tables SI and SII show the ICSO-R 2.0 categories for the post-acute rehabilitation and the

outpatient rehabilitation service types provided at SPC. Since SPC houses various rehabilitation services in a single facility, the ICSO-R 2.0 categories pertaining to the provider dimension, i.e. context, ownership, location, governance, quality assurance and management, human resources, technical resources and funding, are generally the same across the service types. Thus, Table SII does not show the provider dimension categories.

It is noteworthy that SPC has established an extensive quality assurance and management programme, as evident from the measures in place, among other things, for assessing service delivery quality (e.g. measurement of patient satisfaction), identifying problems or shortcomings in service delivery (e.g. huddle board, a standardized tool for visualizing the tasks and workflow of each ward/department), designing activities to overcome deficiencies (e.g. continuous improvement process), and internal audits for improving structure, process and outcome quality. Other audits are regularly conducted to meet certification requirements. Furthermore, SPC has a designated quality manager.

Regarding service delivery, this study includes only selected elements of the ICSO-R descriptions, as summarizing all of them is beyond the scope of this manuscript. In terms of the health conditions and areas of functioning targeted, both post-acute rehabilitation and outpatient services are comprehensive and diverse; however, the table for outpatient services additionally highlights gynaecological conditions and chronic pain. There are also differences in terms of time and intensity of services, i.e. the treatment duration per session in inpatient post-acute rehabilitation is generally shorter than in outpatient rehabilitation, since 2 more treatment sessions per day are provided in post-acute rehabilitation. Regarding the rehabilitation team, in both service types the team is multidisciplinary; however, the post-acute rehabilitation team additionally includes social workers and comprises a considerably higher number of personnel in each discipline. In the larger and complex context of inpatient post-acute rehabilitation, the reporting and documentation of outcomes and other patient information is more extensive, involving the use of specific instruments and goal-setting tools. Furthermore, to help the clinicians choose which assessment tools, clinical examinations and other sources of information to use to accurately assess the medical and functioning needs of patients with newly acquired SCI/D, SPC developed and implemented the Nottwil Standard, a standard assessment schedule that recommends specific tools, examinations and other information sources to employ for the assessment of specific aspects of functioning identified with ICF categories (16).

**Table II.** Overview of the health reporting and certification systems relevant for spinal cord injury/disorder (SCI/D) rehabilitation services in Switzerland

Reporting system	Author	Reporting frequency	Information reported
Hospital Statistics (HS)	Federal Office of Statistics	Annual reporting, since 1997	Main characteristics of hospitals, activity type, health service offer, infrastructure, personnel, finances, diagnoses, procedures, length of stay
Swiss Medical Association Register (FMH)	Swiss Medical Association	Annual reporting, since 2002	Data on practicing physicians, medical graduates, postgraduate training – specialization, places in hospitals, etc.
Swiss Health Observatory Report (Obsan)	Swiss Health Observatory	Annual reporting, since 2002	Reports and indicators at the national, cantonal, regional level for planning and decision-making in health sector
H+ Report	H+ Swiss Association of Hospitals	Annual reporting, since 2005	Administrative and medical statistics (costs, service, intensity, length of stay); development of the inpatient payment system
Swiss Inpatient Quality Indicators (CH-IQI)	Federal Office of Public Health	Annual reporting, since 2006	Quality indicators (number of cases, mortality rates, ratios, length of stay) in acute hospitals
Key Figures for Swiss Hospitals (KSS)	Federal Office of Statistics	Annual reporting, since 2008	Data on structure, patients, services, supply, personnel, finances, hospitalization rates, etc.
National Association for Quality Development in Hospitals and Clinics (ANQ)	National Organization for Quality Development	Annual reporting, since 2009	Quality assessment: Patient outcome satisfaction, measurements in musculoskeletal, neurological, cardiological and pulmonary rehabilitation
Service Specific Hospital Planning Recommendations (GDK)	Conference of the Cantonal Ministers of Public Health	Annual reporting, since 2012	Quality criteria for cantonal hospital planning, service-specific requirements in different areas of rehabilitation (personnel, service offered, infrastructure)
Ambulatory Health Care Statistics (MARS)	Federal Office of Statistics	Launched in 2017	Structural and patient data in outpatient services
SW!SS REHA Quality Criteria	Association of Rehabilitation Hospitals in Switzerland	Certifications since 2014	Quality criteria for outpatient and inpatient rehabilitation; general and specific requirements.

### Potential utility of ICSO-R 2.0

The web search detected 10 health reporting systems relevant to SCI/D rehabilitation (Table II), 2 of which were developed specifically for rehabilitation services in Switzerland, i.e. from SW!SS REHA and ANQ rehabilitation. Some of these reporting systems are mandatory, e.g. Hospital Statistics, and some are part of a voluntary reporting system, e.g. ANQ or certification programme, e.g. SW!SS REHA.

Table III shows the results of the mapping of ICSO-R 2.0 categories and the health reporting systems revealed in the web search. While the majority of the categories are reported regularly in different systems, the categories “1.4. Governance/leadership”, “2.5.2. Catchment area”, “2.6. Facility”, “2.7. Setting” and “2.13. Funding of service delivery”, and their corresponding sub-categories are not reported in any of the identified health reporting systems. This finding pertaining to “Funding of service delivery” is not surprising, since rehabilitation is financially covered in Switzerland, and thus does not need to be asked in health reporting or for certification. The specific reporting of patient-centred care (ICSO-R 2.0: 2.9) was not covered in any reporting system. Of the 24 ICSO-R 2.0 (sub)categories that have been mapped with at least 1 health reporting system, 30% ( $n=7$ ) are covered by more than 1 health reporting system. From the reverse perspective, Hospital Statistics (HS) and SW!SS REHA were the reporting systems that were most frequently mapped with ICSO-R 2.0 categories.

## DISCUSSION

This demonstration project showed that ICSO-R 2.0 could be applied to systematically describe (in

tabular form) the organization of services of an SCI/D specialized rehabilitation centre in Switzerland. This underscores the experience of using ICSO-R to describe community-based rehabilitation in Indonesia, a low/middle-resource country (17), randomized clinical trials (18), different patient groups in Norway (19), and diverse rehabilitation services across the continuum of care in Europe (20) using ICSO-R, albeit the latter 2 projects employed the first version of ICSO-R (8) rather than the most updated 2.0 version (9). Moreover, through a mapping exercise, the current study found that ICSO-R 2.0 has the potential to support health reporting and certification preparation activities by providing a framework for collecting and organizing information about rehabilitation services.

### Challenges of using ICSO-R 2.0

There are opportunities and challenges to using ICSO-R 2.0 to describe the different facets of rehabilitation services. Some of the challenges experienced by Roe et al. (19), in using the first version of ICSO-R, were no longer relevant for the current demonstration project, as many of the issues brought up by Roe et al., such as the lack of a uniform description of the categories and sub-categories, or insufficient consideration of the patient/rehabilitation service user perspective, were addressed in the 2.0 version of ICSO-R. Each ICSO-R 2.0 (sub)category now has a bullet point-like description, with inclusion and exclusion criteria. Nevertheless, the UEMS-PRM deemed it necessary to further operationalize the (sub)categories whose descriptions were insufficiently concrete. For example, for “2.10. Aspects of time and intensity”, specifications in specific number of days (e.g. 2–7 days), months (e.g. 1–3 months) were provided for length of stay/

**Table III.** Overview of the International Classification of Service Organization in Rehabilitation (ICSO-R) 2.0 categories and the related Swiss health reporting and certification systems

ICSO-R categories	Reporting systems	Description
<b>1. Provider</b>		
1.1. Context	HS MARS	Hospitals, activity type: Rehabilitation/Geriatrics; Rehabilitation and physical medicine Medical practices and outpatient centres
1.2. Ownership	HS	Hospitals, ownership;
1.3. Location of provider	HS MARS	Address, postal code Site location
1.4. Governance/ leadership		
1.4.1. Mission		
1.4.2. Vision		
1.4.3. Involvement in governance and management		
1.5. Quality assurance and management	SW!SS REHA ANQ	Quality management requirements Module 1: Patient satisfaction Module 2/3: Measurements for musculoskeletal and neurological/cardio-pulmonary rehabilitation
1.6. Human resources	GDK HS SW!SS REHA	Quality requirements for hospitals on the cantonal hospital list Main groups of health professionals, external personnel Personnel of medical practices, external personnel
1.7. Technical resources	HS  MARS  GDK SW!SS REHA	Instruments, equipment and systems for prevention, diagnosis, treatment, care, and rehabilitation in hospitals Medico-technical infrastructure: utilization of equipment inpatient/outpatient Diagnostic devices, treatment modalities Medico-technical equipment
1.8. Funding of provider	HS	
1.8.1. Source of money	HS	Income from health services; Contributions from municipalities, cantons, federal government, corporations, foundations, and private persons; Insurance classes (basic, supplementary, accident, military, disability) and self-payers;
1.8.2. Criteria of spending	HS	Legal form of organization; the imputed interest rate
1.9. Other categories of provider	HS	Case lump sums, contracts, cantonal budget Ongoing tariff development, considering the degree of dependence and impairment, and the intensity of rehabilitation
<b>2. Service delivery</b>		
2.1. Health strategies (in addition to the rehabilitative strategy)	H+ Def Reha SW!SS REHA	ICF functional health model, holistic perspective ICF-based holistic view of individual
2.2. Service goals	ANQ  SW!SS REHA  H+ Def Reha	Based on the ICF goal documentation – for musculoskeletal and neuro-rehabilitation To achieve the greatest possible independence, reduction of functional limitations, improvement of activities in daily life Reduction of symptoms, improvement of functions, prevention of secondary complications, reduction of risk factors, and reintegration into professional and social environment
2.2. Target group(s)	GDK	Assignment to different rehabilitation service groups based on main diagnosis, and also disease consequences (ICF), admission criteria and treatment needs
2.3.1. Health condition	GDK	Assignment to different rehabilitation service groups based on main diagnosis, and also disease consequences (ICF), admission criteria and treatment needs
2.3.2. Functioning	GDK	Assignment to different rehabilitation service groups based on main diagnosis, and also disease consequences (ICF), admission criteria and treatment needs
2.3.3. Other target group (please specify)	GDK	Assignment to different rehabilitation service groups based on main diagnosis, and also disease consequences (ICF), admission criteria and treatment needs
2.4. Modes of referral		
2.5. Location of service delivery	HS	Address, postal code
2.5.1. Location characteristics	MARS	Site location
2.5.2. Catchment area	MARS	Site location
2.6. Facility	SW!SS REHA	Description of facility including infrastructure
2.7. Setting		
2.7.1. Levels of care		
2.7.2. Mode of service delivery		
2.7.3. Phase of health care		
2.8. Integration of care	SW!SS REHA	Description of integrated care
2.9. Patient-centredness		
2.10. Aspects of time and intensity	SW!SS REHA	Intensity of rehabilitation interventions
2.11. Rehabilitation team	SW!SS REHA	Definition of rehabilitation team members
2.11.1. Professions (of team)	SW!SS REHA	Definition of rehabilitation team members
2.11.2. Interaction approaches	SW!SS REHA	Required interprofessional team meetings
2.12. Reporting and documentation	SW!SS REHA	Documentation of rehabilitation interventions, a rehabilitation plan and assessments
2.13. Funding of service delivery	HS	Income from health services
2.13.1. Source of money	HS	Contributions from municipalities, cantons, federal government, corporations, foundations, and private persons; Insurance classes (basic, supplementary, accident, military, disability) and self-payers;
2.13.2. Criteria of payment		
2.14. Other categories of service delivery (please specify)		

HS: Hospital Statistics; MARS: Ambulatory Health Care Statistics; GDK: Conference of the Cantonal Ministers of Public Health; SW!SS REHA: SWISS REHA Quality Criteria; ANQ: National Association for Quality Development in Hospitals and Clinics; H+: H+ Swiss Hospitals.

treatment period and asked about the mean duration of single treatment sessions in minutes. Furthermore, UEMS-PRM develop a form to facilitate the documentation of the ICSO-R categories that are applicable to the healthcare facility being described. See Tables SI and SII.

Despite these improvements and efforts by UEMS-PRM to make the use of ICSO-R 2.0 more user-friendly, some categories were found to be challenging: “2.11.1. Professions, competencies” and “1.4.3. Involvement in governance and management”. Regarding “Professions, competencies”, it was difficult to allocate the number of health professionals of different disciplines to post-acute rehabilitation vs other rehabilitation service types offered at SPC, as some staff work in more than 1 rehabilitation service type. This may have not been an issue if this category had been used as published, i.e. without specifying the staff allocation. More important than the staff allocation may be the mode of interaction between professions. Andelic et al. (18) emphasized that interactions between team members are key to successful rehabilitation. In fact, the items under 2.11.2 Interaction approaches were found to be quite user-friendly. Regarding “Involvement in governance and management”, we initially had difficulty understanding the terms “elected body” and “users/user groups”. We ultimately interpreted “elected body” as a Board of Directors, whose members are elected. Regarding “users/user groups”, it was unclear if this refers to patient’s advocacy groups and Persons with Disability Organizations or whether this also includes the Staff/Employee Council. Some clarifying text may be warranted for such terms.

Furthermore, although the ICSO-R 2.0 covers structural, procedural and financial aspects, including additional elements to the classification that reflect the user/patient perspective, the involvement and satisfaction of healthcare professionals and more details about the rehabilitation processes are warranted for a description of rehabilitation services with a 360° perspective. The authors suggest that the developers of ICSO-R consider this for the next revision of the classification.

#### *Opportunities in using the ICSO-R 2.0*

This project was conducted not solely for the purpose of demonstrating the feasibility (including usability) of ICSO-R 2.0, but to also explore its potential utility in rehabilitation quality management. Previous testing of ICSO-R has suggested the potential use of it in rehabilitation quality management, for example, in identifying quality indicators (19) and for facilitating comparability and benchmarking (20). For us, ICSO-R 2.0 creates the opportunity to ease the burden of preparing national health reporting and certification by

providing a framework for organizing service-related data needed to complete health reporting and certification documentation. Table III clearly shows that most of the ICSO-R 2.0 categories are associated with data required by specific health reporting systems relevant for SCI/D. The organization of service-related data includes the standardization and transformation of data of different formats, such as narrative descriptions, into a meaningful and comparable manner. The ICSO-R 2.0 (sub)categories would basically serve as identifiers of data that may be needed for national health reporting and certification.

To optimize the utility of ICSO-R 2.0 in supporting national health reporting and certification at SPC and at other rehabilitation facilities in Switzerland, certain categories and descriptions may need elaboration. For example, SWISS REHA places value on infrastructure and complementary process descriptions and staff competencies, skills and knowledge. Thus, a more nuanced description of infrastructure and complementary processes in the ICSO-R 2.0 categories “1.7 Technical resources”, “1.8.2 Criteria of spending” (on infrastructure) and “2.6 Facility”, and of staff education in “2.11 Rehabilitation team” would be valuable.

Another potential application of ICSO-R 2.0 at SPC and SCI/D rehabilitation in Switzerland is the identification of (potential) service gaps. Gap analysis was also identified by the developers of ICSO-R as a step toward improving rehabilitation services, whereby also considering country-specific needs (9). Knowing the status of rehabilitation services and identifying service gaps may lead to a change in services as well as in the development of new services. For example, in “2.7.2. Model of service delivery”, we identified day service as a service that is currently not part of SPC’s rehabilitation service package, but one that we may develop in the future. Gap analysis using ICSO-R 2.0 may also be useful beyond the meso-level. In the case of SCI/D rehabilitation, ICSO-R 2.0 could be used to compare service-related data across SCI/D rehabilitation providers and identify whether rehabilitation capacities; for example, in terms of number of inpatient beds and outpatient service capacity, are sufficient to ensure national SCI/D healthcare needs are met (21).

#### *Study limitations*

This paper presents a proof-of-concept for using ICSO-R 2.0. The real test of ICSO-R 2’s feasibility and utility in supporting national health reporting and certification would be to apply it in a real-life health reporting and/or certification situation at SPC as well as in the other 3 national SCI/D specialized centres in Switzerland. Real-life testing would especially highlight the time and human resources necessary for

preparing the ICSO-R-specific data that map to the specific health reporting or certification system being used, as well as the trust and acceptance of this data by the participating staff members.

### CONCLUSION

This project demonstrated that ICSO-R 2.0 can be used to comprehensively describe the post-acute and outpatient services of an SCI/D specialized centre in Switzerland. Despite some challenges related to inadequate category descriptions and difficulties in differentiating service-related data (e.g. staff workload) that belong to post-acute vs outpatient rehabilitation, ICSO-R 2.0 has the potential to facilitate national health reporting and certification by providing a framework for organizing service-related data needed to complete health reporting and certification documentation, and ICSO-R 2.0 (sub) categories can serve as identifiers of data needed for national health reporting and certification. ICSO-R 2.0 can also support service gap analysis and promote comparability of service-related data. A future next step would be to test the real-life application of ICSO-R 2.0 in supporting national health reporting and certification.

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