Measuring equity of care in Swiss hospitals: a feasibility study

PRIORITY-Study:
Panorama of Indicators on Equity in Healthcare

Geneva University Hospitals (HUG)
Unisanté, University Center for Primary Care and Public Health, Lausanne, Switzerland

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On behalf of

Impressum

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Summary

More and more international institutions consider equity as an essential component of quality. In Switzerland, the 2019 national report on quality of care has also positioned equity as a component of quality of care[1].

The measurement and evaluation of equity in care indicate the existence of systematic inequities in access to and administration of care, based on individual factors such as ethnicity, gender, age, sexual orientation, or socio-economic status[2,3]. These inequities especially affect people in vulnerable situations, such as those facing unstable socio-economic situations or those who have been through forced migrations.

Those inequities must be fought, not only for ethical reasons, but also because they have an impact on the healthcare system in terms of public health policies and priorities, as well as its broader economic consequences and its overall economics. In Switzerland, there is, however, no systematic way of measuring and highlighting these inequalities in access to and quality of care. Yet it is a necessary step towards improving the quality of care for patients.

This report presents a series of indicators of equity in hospital care in Switzerland, selected based on 4 criteria: validity, feasibility, patient coverage and actionability. These indicators are related to both inpatients and outpatients, and aim to assess structure (availability of resources), processes (e.g. care or use of clinical pathways), and patient outcomes.

The choice of indicators was made by a support group composed of a patient partner and 17 experts in the fields of medicine, epidemiology, sociology, quality of care and health surveillance, working in Swiss healthcare and research institutions in the various language regions.

The group selected 11 indicators (see table below: structure, process and result indicators), and 5 vulnerability criteria, to compare populations in vulnerable situations with the general patient population; for example, satisfaction with care between allophone patients and patients whose mother tongue corresponds to the local language.

Each indicator and vulnerability criterion were then operationalized and tested in three pilot hospitals in Geneva, Zurich and Mendrisio. The indicators selected evaluate patient satisfaction, access to information via interpreters and delays between expression of needs and care provision. The vulnerability criteria used were 1) gender, 2) migration status, 3) language, 4) age and 5) homelessness.

Our survey results showed 3 degrees of availability among the proposed indicators and criteria: widely available, partially available, and not measured. The data needed to produce most of the indicators is partially available in each institution, apart from information on the use of interpreters. This work has also shown that gender is collected in a dichotomous format that is fixed over time, which is a limitation in relation to the spectrum of genders with which patients from LGBTIQ+ communities identify. This shows that belonging to specific vulnerable groups

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[1] Enhancing the quality and safety of Swiss healthcare, C. Vincent, A. Staines, 25 June 2019
[2] Association between colorectal cancer testing and insurance type: Evidence from the Swiss Health Interview Survey, Braun et Al., 2012
[3] Examining the effect of quality initiatives on decreasing racial disparities in maternal morbidity, Davidson et Al., 2019

can be invisible. The next step will be to assess the quality of the data available, and then the equity of care according to vulnerability criteria.

The selected and operationalized indicators will serve two main purposes, i.e. be an implementation guide for readily available indicators, as well as propose improvement suggestions for the measurement of health equity in Switzerland to all health institutions interested in equitable healthcare.

Feedback from the consulted stakeholders was encouraging, recognizing the proposed set of indicators and vulnerability criteria as valid, with good patient coverage and good actionability. However, they expressed doubts about the ease of implementation, for both technical and cost reasons. They also deplored the absence of gender measured over time (sex assigned at birth and gender), as well as socio-economic level and the presence of a psychiatric diagnosis as vulnerability criteria, three measures that had been excluded in the selection phase based on the feasibility criterion.

Selected Indicators (Table 2 of the report)

Theme	Indicators		
	Outcome	Process	Structure
Patient Experience	Patient satisfaction	Delay to treatment: Time in hours between the need of a patient and the delivery of the corresponding care Proportion of allophones having benefited from the services of an interpreter	Existence of continuous training on cross-cultural skills
			Access to real-time translation and sign language for deaf patients
			Existence of an institutional referent for migrations
Language Barrier	Patient satisfaction	Proportion of allophones having benefited from the services of an interpreter	Availability of main documents in different languages
			Existence of an outpatient support structure for patients with a migration background
Common to both			Existence of continuous training on cross-cultural skills
			Availability of interpreters

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Context

At the international level, more and more institutions, such as the World Health Organisation (WHO), the Organisation for Economic Co-operation and Development (OECD) and the Institute for Healthcare Improvement (IHI), are increasingly focusing on quality of care and on the definition of its components. In addition to effectiveness and safety of care, or patient-centred care, these institutions now include equity of care. (1–4).
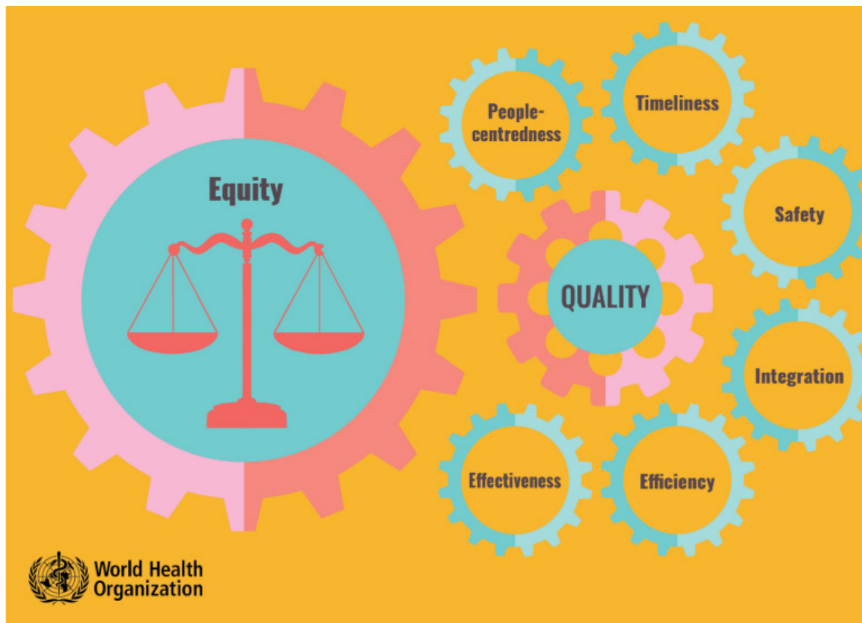
Figure 1: Equity as a dimension of quality, WHO (5)

Healthcare equity is the absence of unfair and avoidable care differences between groups defined by common factors, be they social, demographic, ethnic, geographic or any other (6,7). An increasing number of studies show, internationally and in Switzerland, that individual patients factors like gender, age, identification to an ethnic group, sexual orientation or socioeconomic status impact access to care and quality of care (8–10). This reveals the existence of healthcare inequities in access and administration of care. Those inequities must be fought, not only on ethical ground but because they impact the healthcare system.

Inequities particularly affect patients in vulnerable groups. For example, patients from lower socio-economic status have a higher mean number of comorbidities and have hence a higher risk of experiencing poorer health outcomes in middle or long term, like complications or early hospital readmissions (11,12). Moreover, those vulnerable populations often suffer from a worse access to care. This phenomena is described by the "inverse care law": vulnerable populations have higher healthcare needs and yet lower access (13,14).

From an economic standpoint, Swiss studies have shown that inequities exist in screening tests for breast cancer (15), or cervix cancer (16,17), disease that have a lesser cost when treated early, particularly if social costs in lost years of life are factored in (18–20). From a public health standpoint, the recent COVID-19 pandemic revealed existing differences in healthcare access (21–25) and the potential risk for the whole population that the undertreatment of a subgroup represents (21,26–28). Indeed, under screened and underfollowed groups

were a virus reservoir and took part in reactivating infection waves. In Switzerland, the 2019 national report on healthcare quality – which led to the creation of the Federal Commission on Quality – also established equity as a component of quality of care (29).

In order to reveal inequities and, ultimately, improve healthcare quality for patients, there is a need to monitor and measure current equity and quality of healthcare (30,31). Switzerland is lagging behind on this matter in comparison to the US or Great-Britain who both have established systematic programs of equity of care monitoring for many years (32,33). This delay limits the capacity to evaluate the efficacy of quality improvement programs. However, studies showing preliminary results pinpoint shortcomings of the system, which raises new questions. A practical challenge is to obtain higher quality data and information to better understand the manifestations of inequity and identify groups at risk of inequity. To do this, it is essential to test whether it is possible to create a systematic measure of equity of care in Switzerland. This report is the result of a mandate issued by the Federal Office of Public Health.

Definitions and indicator types

In order to lead to institutional and structural changes that will improve equity of care, health systems need a set of indicators that assess equity of care. An indicator is a tool that measures the reality of an often-complex situation based on data collection. As equity in care is a complex phenomenon, the selected indicators should measure equity at the level of structures, processes, and results.

– **Structure indicators** evaluate the availability of resources.

– **Process indicators** evaluate for example care or clinical pathways (34,35). Along with the structure indicators, they allow an evaluation of the current state of equity in care administration.

– **Outcome indicators** allow the evaluation of the effects of equity improvement programs by focusing on medium and long-term outcomes for patients. While they allow concrete evaluation of the effects of equity improvement programs, they also are more easily influenced by patient characteristics and population health inequities.

Indicators attribute

For a set of indicators to be widely adopted and lead to change, the indicators must be valid, standardized and, at first at least, easy to implement.

– **Valid indicators** should allow the reliable identification of inequities. For example, the waiting time between cancer diagnosis and the start of treatment is a valid indicator. Conversely, socio-economic level is usually not measured at the individual level in hospitals. It is possible to use geographical indicators based on ZIP codes or on the average rent price per square meter, but this indicator loses some validity by grouping together people with very different access to care (36).

– For better comparability of institutions, it is important to consider the differences in context between institutions and therefore aim for standardization of the indicators – in other words, relate them to a theoretical standard population. **Standardization**, by allowing comparison between populations with structural differences, has two major advantages. First, it allows having a more objective look at equity throughout Switzerland. Indeed, some indicators can

be presented as a success to be credited to an institution, whereas they depend on an advantageous local situation (37). For example, the headquarters of international institutions such as Geneva or Zürich have more interpreters trained in the interpretation and cultural mediation of medical information than other regions, which could allow an advantageous evaluation of quality that does not reflect reality. Secondly, standardized indicators allow highlighting model institutions in certain aspects, which can serve as inspiration for implementing improvement projects in other institutions.

– **Ease of implementation** is important initially for the set of indicators to be more quickly and widely adopted. However, it should not be a limiting factor thereafter, some inequities being difficult to detect but no less ethically unacceptable, costly for the health system and dangerous for patients. For example, to be able to shed light on a situation where LGBTIQ+ people experience systematic inequity in care, it would be necessary to be able to identify them in the patient population. However, this data is currently rarely collected in Switzerland and would therefore be very difficult to implement.

Moreover, to be able to properly reveal inequities, the indicators must allow comparisons between several groups that are suspected to receive different levels of quality of care. For example, one might suspect that older people have less frequent access to interpreters than younger patients. Thus, to be able to analyze this phenomenon, the "access to an interpreter" indicator must be stratifiable on **vulnerability criteria**. These vulnerability criteria must meet the same requirements as the indicators and must therefore be valid, **standardizable**, and **easy to implement**.

Research on equity in Switzerland

The Swiss research community actively studies equity, with many projects seeking to highlight or correct local inequities. For example, Unisanté in Lausanne has, on behalf of the Federal Office of Public Health (FOPH), proposed a set of indicators including potentially avoidable or inappropriate hospitalizations (38). Similarly, the SPAM (Swiss Primary Care Active Monitoring) program proposed a series of 56 quality indicators for primary care medicine, including 2 dedicated to equity of access to care (39). Another example is the SIHOS study, which aims to investigate the links between social determinants and the risks of adverse health events for patients suffering from chronic diseases in Switzerland (40). Other projects have attempted to correct these known inequities, for example by adding interpreters to the emergency room (41) or via the Migrant Friendly program of an acute care hospital (42). The multiplicity and variety of projects show that the Swiss healthcare quality community is booming and would benefit from a national framework that would allow comparison of different locations and the sharing of innovative solutions between regions. However, a systematic approach to measuring and monitoring equity in care is still lacking. Such an approach should ideally cover the whole care pathway. In this project, we propose to start at the inpatient and outpatient hospital levels, to allow the first steps towards a systematic process of evaluating equity in care in Switzerland.

Goals

The primary goal is to test the feasibility of measuring equity in the clinical setting, by proposing a set of valid, implementable and actionable equity indicators, composed of quality of care indicators and vulnerability criteria. An example would be an indicator that assesses, for each allophone person, whether they have benefited from interpreting services. This indicator could then be stratified according to different vulnerability criteria such as migration status, gender, or age category. The second objective is to carry out a pilot study in several hospitals to determine the availability of data necessary to produce these indicators.

Methodology

Creation of a national expert taskforce

To promote the validity and representativeness of the indicators and to include the different sensitivities concerning the application of equity in the hospital environment, we recruited a panel of national experts in equity of care. To broadly recruit experts, a brochure (Appendix 1) presenting the project was distributed to various institutions interested in equity (e.g., Swiss Health Network for Equity (SH4E)), as well as to H+, and patient associations).

This procedure made it possible to form a group of 18 experts (12 men, 6 women) in the field of equity of care in Switzerland, including one patient partner. The experts represent the 3 main linguistic regions and come from varied backgrounds with 7 doctors including 4 internists, 2 psychiatrists and 1 emergency doctor, 2 sociologists, 3 epidemiologists, 6 researchers working in the field of public health and health systems and/or in the quality of care. The patient partner, in addition to her personal experience, works internationally as a patient partner/expert in many areas including equity and is the director of a national chronic disease registry.

The experts have research and/or work experience in the field of equity of care in Switzerland or have worked in Swiss university polyclinic hospitals, in outpatient or stationary care, or have held positions in Swiss public health institutions.

The structure of the project reflects this desire to include many equity actors (Figure 2), with a team of coordinators to centralize the work, a panel of experts representing different backgrounds, but also external evaluators who will evaluate the report before its final publication.

Structure and actors of the project

External evaluators

- Associations and NGO working with potentially underserved populations
- Other healthcare professionals

Experts panel

- FOPH
- Experts of various Swiss hospitals and universities
- Patients

Coordinators

- Unisanté:
  Patrick Bodenmann
  Joachim Marti
- HUG:
  Yves Jackson
  Delphine Courvoisier
- Support:
  Clément Buclin and Kevin Morisod
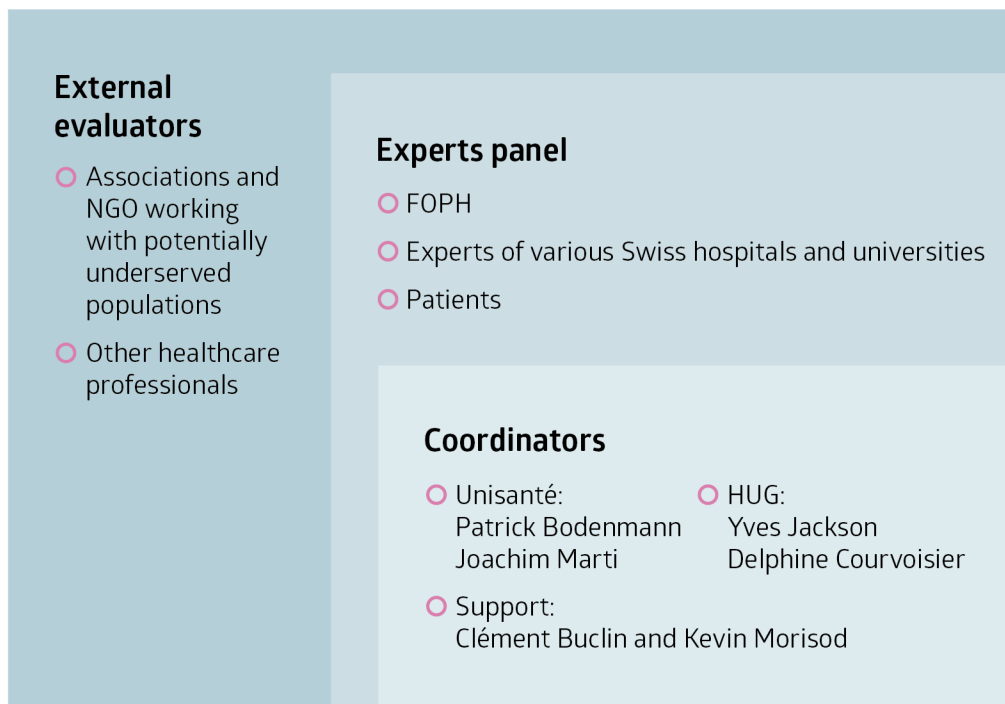
Figure 2: Structure and actors of the project

Selection of an indicator list

To obtain a broad base of relevant indicators, an initial list was developed both with a review of the literature and via a call to experts to propose all the indicators that they deemed relevant. The literature review was carried out in November 2021 on MEDLINE, focusing on Swiss projects to obtain indicators compatible with the Swiss healthcare system (search strategy available in the appendix: Appendix 2). The search strategy produced 247 citations evaluated first based on the title and abstract and then on the full text. For each selected article, equity indicators were extracted based on the full text.

In parallel, the experts proposed structure, process, and outcome indicators, for inpatient and ambulatory patients. The form designed to collect this information specified the 6 types of indicators sought (e.g., stationary, process indicator) (Appendix 3: online questionnaire), to ensure that all types of indicators are represented in their suggestions.

The experts then met for the first time to establish the conditions on which they would select the indicators. We retained validity, patient coverage, feasibility and actionability (see Figure 3 for definitions).

The selection of indicators proceeded in two voting phases following a Delphi methodology. During the first phase, the experts assessed each indicator and each vulnerability criterion on a scale of 0-10 for each of the 4 chosen conditions (Appendix 3: online questionnaire). At the end of the first voting cycle, only indicators with an average validity >7 and for which ≥ 60% of the experts had given a score of 7 or more were kept. During this phase, the experts still had the opportunity to add an indicator or a vulnerability criterion if they deemed it necessary.

Prior to the second phase, the indicators selected in the first phase were organized into themes

Table 1: Example of an inpatient theme that was not kept: rehospitalizations

Theme	Indicators		
	Outcome	Process	Structure
Rehospitalizations	Early rehospitalization rate	Length of stay	Availability of social workers
			Availability of information documents in simple language

For example, the theme "rehospitalizations" holds the following logic: the availability of social workers and/or information on treatments could reduce delays in hospital care, which would reduce the average length of stay and the risk of problems during transitions of care, thus acting on early readmissions (see Table 1). The intent was that these themes could be used to assess a topic of equity of care with structure, process, and outcome indicators. These indicator themes were separated into groups according to the assessment of inpatient care (e.g., rehospitalization rate) or ambulatory care (e.g., cervical cancer screening rate), and the vulnerability criteria were kept apart.

For the second phase, the experts ranked the themes and the vulnerability criteria based on a combined criterion of feasibility and actionability (Appendix 3: Online questionnaire).

– Validity is the ability of an indicator to assess the object it intends to assess.

– Feasibility describes the difficulty of implementing the indicator or collecting the data necessary for its construction. An indicator that would require, for example, the implementation of a new form, the contact of individual patients or a long process of data collection would be more expensive and less feasible and could discourage the introduction of equity indicators.

– Patient coverage describes the number or percentage of patients affected by this indicator in relation to the total patient population. Thus, an indicator linked to all stationary or ambulatory patients who have seen a doctor in the last 6 months would have better coverage than an indicator limited to pediatric patients suffering from a dermatological condition.

– Finally, actionability describes the capacity of the indicator to be modified following an equity improvement project. Thus, an indicator which reveals an inequity linked to the geographical location of a hospital would have poor actionability as it is obviously challenging to modify whereas an indicator which reveals an inequity due to a badly formulated text in a medical form would have excellent actionability.

Definitions of indicator selection criteria

If one wants an indicator measuring the white numbers	7 5 8	
Indicator		
	↓ ↓ ↓	
Validity is the ability of an indicator to assess the object it intends to assess	7 5 8 6 9 7	○ Good validity ○ Poor validity
Patient coverage describes the percentage of patients assessed by the indicator	7 5 8 □ □ 8	○ Coverage: 100% ○ Coverage: 33%
Feasibility describes the difficulty of implementing the indicator or collecting the data necessary for its construction	7 5 8 ? ? ?	○ Good feasibility ○ Poor feasibility: hard to collect or missing variables
Actionability describes the potential of the indicator to be useful to action	9 7 10	○ Good actionability: indicator modified after an improvement of a situation

Figure 3: Definitions of indicator selection criteria

Operationalization of indicators

The vulnerability indicators and criteria have been operationalized into lists of variables and indicator sheets describing their precise calculation rules. These indicator sheets were submitted to the experts for validation.

Pilot study of the indicators

To better ensure their feasibility, once the set of indicators was selected, we determined the practical feasibility in hospitals, in particular by assessing the availability of data to produce the indicators. To do this, three hospitals, the Universitätspital Zürich (USZ), the Geneva University Hospitals (HUG) and the Ente Ospedaliero Cantonale, Mendrisio site (OBV – Ospedale regionale Beata Vergine), ran a test extraction of data from their patient files. The hospitals were chosen on a voluntary basis while maintaining a goal of representativeness with hospitals from the 3 major linguistic regions, and of different sizes, the USZ and the HUG being University hospitals and Mendrisio an intermediate hospital.

The indicators were extracted for all inpatient or ambulatory patients presenting to each of these hospitals in 2021. The data needed to build the process and outcome indicators were directly extracted from the hospital databases taking only the variables available in a structured format in the databases and therefore excluding variables in free text fields. The structure indicators were constructed via a questionnaire submitted to the persons in charge of quality of care in each hospital.

Results

Indicators' generation

The literature review identified 32 relevant articles that evaluated the equity of care in Switzerland, corresponding to 34 indicators. At the same time, the experts proposed 195 indicators of structure, process or outcome, and categorized them as ambulatory or stationary. After removing duplicates and merging the indicators from the literature review and the indicators proposed by the experts, 159 unique indicators and 15 vulnerability criteria were submitted for expert voting. The full list of indicators and vulnerability criteria is available in the appendix (Appendix 4)

The first Delphi phase selected 35 indicators and 8 vulnerability criteria which were organized into themes. We had 3 ambulatory themes: "Language barrier", "Economic constraints" and "Prevention and screening" and 3 stationary themes: "Rehospitalization", "Admission" and "Patient experience". The themes have been organized in such a way that structural factors can impact the efficiency of processes and ultimately improve results. The full list of indicators classified into themes is available in the appendix (Appendix 5).

The second voting phase, based mainly on feasibility and actionability, retained 2 themes: "Patient experience" and "Language barrier", which corresponds to 5 outcome and/or process indicators and 10 structure indicators. The experts also voted to exclude an indicator that was considered valid but did not fit into one of the themes.

Generation of the indicators through a voting process

Generation of the indicators	Literature: 34	Experts: 195
Deduplication	159 indicators 15 vulnerability criteria	
1. Selection by votes on validity	35 indicators 8 vulnerability criteria	
Classification	6 indicator themes 8 vulnerability criteria	
2. Selection by votes on feasibility and actionability	2 themes corresponding to 11 indicators 5 vulnerability criteria	
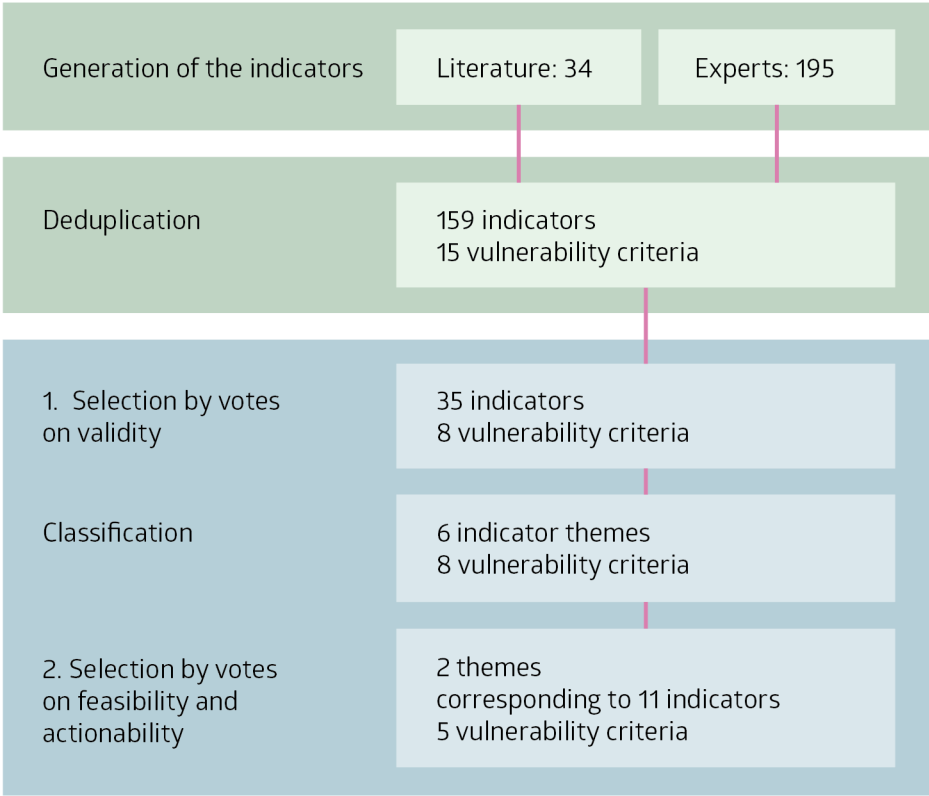
Figure 4: Generation of the indicators through a voting process

Final set of indicators and vulnerability

The selection process retained 2 themes: "Patient experience" and "Language barrier" and 5 vulnerability criteria to stratify the indicators: the gender with which patients identify, thought of in opposition to the biological sex, migration status, allophone status, age and "homeless" status.

Table 2: Selected indicators

Theme	Indicators		
	Outcome	Process	Structure
Patient Experience	Patient satisfaction	Delay to treatment: Time in hours between the need of a patient and the delivery of the corresponding care Proportion of allophones having benefited from the services of an interpreter	Existence of continuous training on cross-cultural skills
			Access to real-time translation and sign language for deaf patients
			Existence of an institutional specialist/point-of-contact for migrations
Language Barrier	Patient satisfaction	Proportion of allophones having benefited from the services of an interpreter	Availability of main documents in different languages
			Existence of an outpatient support structure for patients with a migration background
Common to both			Existence of continuous training on cross-cultural skills
			Availability of interpreters

Pilot study

To enable a concrete pre-test of the indicators in the implementation sites, indicator sheets were produced (see Appendix 6). These sheets function as a user manual for any institution willing to implement the indicators. They contain all the information on the variables to be extracted as well as the detailed calculation method of the indicator.

Table 3: Indicator sheet example: "Proportion of unsatisfied patients"

Indicator	Proportion of unsatisfied patients
Measure unit	Percentage
Calculation method	Proportion
Numerator	Number of dissatisfied patients according to the overall satisfaction score. If the questionnaire used does not produce an overall score, use the general impression score or the single general impression question. Dissatisfied patients are defined using the definition from the chosen questionnaire. If the questionnaire does not contain a validated definition of the concept of dissatisfied patient, use the following definition: A dissatisfied patient is a patient whose answers to the satisfaction questionnaire are in the lower half of the possible answers for at least half of the satisfaction questions. For example, if the score used is made up of 4 questions each with 5 possible answers (for example ranging from: "Not at all satisfied" = 1 to "Very satisfied" = 5), a dissatisfied patient would have at least 2 questions with answers between 1 and 2.
Denominator	Total number of hospitalized patients
Reference date	Discharge date
Data source	Patient satisfaction questionnaires (e.g.: Picker patient experience)
Perimeter	Adult hospitalized patients: All adult patients who have been admitted to the institution for at least 24 hours
Complementary information necessary	Discharge date

These indicator sheets were then sent to the three pilot hospitals with instructions to extract the indicators from the databases for the whole year 2021. For university hospitals, this corresponded to several tens of thousands of patients stays and several hundred thousand of consultations. Mendrisio Hospital is a smaller hospital with 155 beds, which is reflected in the number of patients admitted during the year. Table 3 presents, for each pilot hospital, the availability of each indicator and each vulnerability criterion, according to two aspects: first, do the necessary variables exist ("availability") and second, are these variables actually populated with data ("information"). For example, there may be a variable to note the language spoken by the patient, but this information may only be present in 10% of patients. For the vulnerability criteria, the table also presents the detail with which the criterion exists in the different institutions. For example, gender is defined in two categories (masculine or feminine) in Mendrisio but exists in three categories at USZ and HUG (masculine/feminine/undetermined). However, at the HUG, in practice, gender is only entered as male or female, despite the existence of a third option. For the structure indicators, the table indicates whether the person in charge of quality of care had the information to answer a questionnaire on the availability of the structures or services indicated (Appendix 7 for questionnaire).

Table 4: Availability of indicators in each implementation site

Implementation site	HUG		USZ		Mendrisio	
Total N of stays	262'317		380'972*		61'595	
Stationary	49'820	(19.0%)	40'667	(10.7%)	5'801	(9.4%)
Ambulatory	212'497	(81.0%)	340'305	(89.3%)	55'794	(90.6%)
Stationary indicators*	Avail.**	Inform.**	Avail.**	Inform.**	Avail.**	Inform.**
Satisfaction	Yes	17.1%	Yes	6.2%****	ANQ*****	4.5%
Translation	No	0%	Yes	100%	No	0%
Delay	Yes	100%	Yes	100%	Yes	72.0%
Ambulatory indica-tors*						
Satisfaction	Yes	3.0%	Yes	6.1%****	No	0%
Translation	No	0%	Yes	100%	No	0%
Vulnerability criteria*						
Gender	(M/F/I)	100%	(M/F/I)	100%	(M/F)	100%
Migration	Yes	89.0%	Yes	98.2%	Yes	78.4%
Allophone	Yes	86.7%	Yes	99.9%	Yes	8.8%
Age	Yes	100%	Yes	100%	Yes	100%
Homeless	Yes	100%	No	0%	No	0%
Structure indicators*						
Documents	Yes		Yes		Yes	
Interpreters	Yes		Yes		Yes	
Sign language	Yes		Yes		Yes	
Cultural	Yes		Yes		Yes	
Undocumented	Yes		Yes		Yes	
Migration	Yes		Yes		Yes	

*   The total at USZ does not include patients that were seen as partial inpatients
**   Avail. = Availability; Inform. = information
***   Vulnerability indicators and criteria are presented via their shortened titles. Full names and definitions are available in appendix 6: Indicator sheets, page: Overview of indicators
****   The satisfaction survey in USZ is only available in German.
***** ANQ: Data not collected in the institution itself but participation in the collection by and according to the schedule of the national association for the development of quality in hospitals and clinics (ANQ)

This implementation test allowed verifying whether the concrete collection of the variables necessary for the construction of the indicators was possible. It led to some clarifications of the indicator sheets. Overall, data to construct stationary indicators are more readily available than those needed to construct ambulatory indicators. Indicators and vulnerability criteria have higher availability in the university hospitals of Geneva or Zürich than in the hospital of Mendrisio. This may be due to the costs and workload associated with data collection, which are more easily supported by large structures that has more financial and human resources available. Another potential explanation for this difference can be found in the geographical

and political context of Geneva and Zürich, which are factually more confronted with the question of interculturality and multiculturalism and have therefore collected data on equity of care earlier.

It is also interesting to note that patient satisfaction is sometimes collected directly by institutions, such as HUG and USZ, but it is also collected at national level. The Swiss National Association for Quality development in hospitals and Clinics (ANQ) has been collecting patient satisfaction for many years for every health institution in Switzerland. However, the ANQ satisfaction questionnaires do not ask the patient about their vulnerability criteria (for example on their spoken languages) nor do they allow the establishment of a link with the demographic information specific to the patient in the hospital information systems.

Figures 5 and 6 represent the data availability results in graphical form. It shows, for each indicator and vulnerability criterion, the percentage of data available in each institution. For the indicators (Figure 5), there are three degrees of availability of the necessary data within each institution:

1. Widely available indicators such as "Delay in care" in the three institutions or "Translation" at the USZ. These indicators are based on variables already collected routinely and are therefore easy to measure.
2. Partially available indicators such as "Inpatient or outpatient satisfaction". However, due to the relatively low response rate, these indicators are, in practice, available for a minority of patients.
3. Completely unavailable indicators such as "Translation for stationary or ambulatory patients" at HUG and Mendrisio. It should be noted that the documentation of the use of translators is not available in a structured wassy in the patient files, but that these two hospitals indicate that they have access to many interpreters.

Availability of indicators in each institution

Percentage of stays for which the indicators' data were available

	HUG	USZ	MENDRISIO
Inpatient Satisfaction	17%	6%	5%
Inpatient Translation	0%	100%	0%
Inpatient Delay	100%	100%	72%
Outpatient Satisfaction	3%	6%	0%
Outpatient Translation	0%	100%	0%
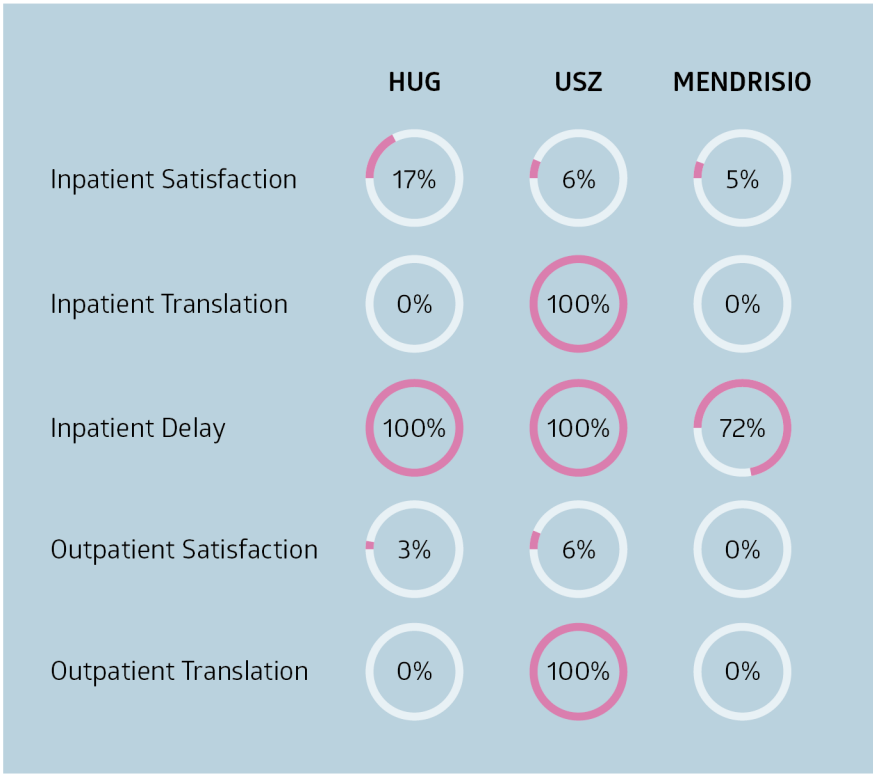
Figure 5: Availability of indicators in each institution

As for the vulnerability criteria (Figure 6), age and gender are always available. Migration status is not directly available. It was constructed using nationality, country of residence, type of insurance (basic, semi-private or private insurance) and type of residence permit. This constructed migration status indicator is also widely available. Interestingly, the spoken language was indicated at HUG and USZ but much less so at Mendrisio Hospital. Finally, the "homeless" vulnerability criterion is only available at HUG.

Availability of
vulnerability criteria in each institution

Percentage of stays for which the indicators' data were available

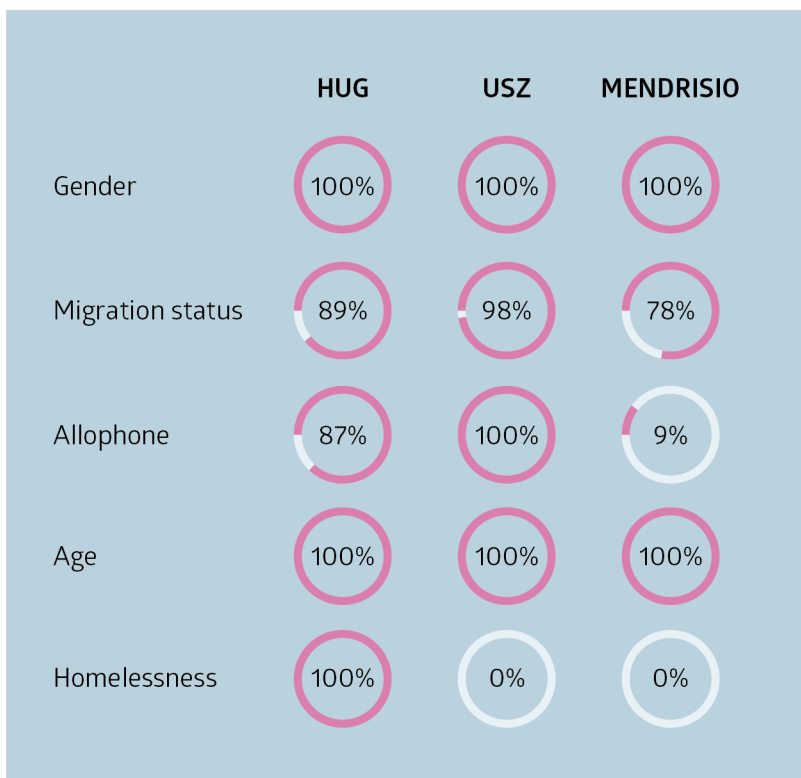|	HUG	USZ	MENDRISIO
Gender	100%	100%	100%
Migration status	89%	98%	78%
Allophone	87%	100%	9%
Age	100%	100%	100%
Homelessness	100%	0%	0%

Figure 6: Availability of vulnerability criteria in each institution

In addition to availability, the way certain vulnerability criteria are measured should be considered. For example, gender is very widely documented via the sex variable in a dichotomous format (male/female) which is very limiting in comparison to the gender spectrum with which patients from LGBTIQ+ communities identify. It is therefore impossible to correctly assess the level of health equity of these populations with the current data. Similarly, there is no routinely recorded variable of the migration status of populations, which leaves populations of migration background, and in particular forced migration, in a blind spot of equity assessment in care.

These results are promising as they highlight that healthcare institutions wishing to assess the equity of care would be able to do so, by identifying among their routinely recorded variables those that could be used to measure equity. It also highlights data not, or almost not, available, that hospitals might want to record to assess equity. The indicator sheets produced thus serve a dual function of instructions for the indicators that can be achieved from the outset and avenues for improvement for the measurement of equity in care in Switzerland, to all health institutions interested in equitable healthcare.

Discussion

Summary of results

A national taskforce of experts on equity of care has developed 11 equity indicators that are valid, feasible, provide good patient coverage and can be used to pilot projects to improve equity in care (actionable). The indicators are accompanied by 5 vulnerability criteria, which allow stratification of the indicators to compare populations in a situation of vulnerability with the general patient population. For example, satisfaction with care can be compared between allophone patients and patients whose mother tongue corresponds to the local language. The indicators have been operationalized into indicator sheets which serve as instructions for their implementation in Swiss healthcare structures. A feasibility study in three hospitals covering the main linguistic regions of Switzerland shows that 2 out of the 5 indicators measured at the patient level can already be implemented using routinely collected data by the hospitals and the ANQ. The 6 structure indicators can be assessed by questioning the quality managers of the institutions.

Opinion of associations and key stakeholders in the health system.

This report is the result of work with a relatively large panel of experts and the conduct of a pilot test in three hospitals. Nevertheless, equity is a very complex subject and the sensitivities and interests of all the stakeholders could not all be represented. This is why this report and the detailed appendices containing the results were sent or presented to numerous associations and institutions before being finalized (for a full list of associations and institutions, see Appendix 8). We present below their main feedback and comments, as well as their suggestions for continuing the project.

The 7 associations and institutions that provided feedback felt that the report was understandable and easy to read (mean (m): 7.7/10) and met a real need for indicators of equity of care. The majority felt that, if adopted, the indicators would have fairly good validity (m: 6.7/10) and patient coverage (m: 5.9/10) and would lead to a concrete improvement in equity (1 strongly agreed, 6 partially agreed). However, respondents were more pessimistic about the ease of implementation (m: 4.4/10). Most respondents felt that implementing these indicators would require a great deal of motivation from hospitals and would generate high costs, two factors that would be substantial obstacles to the implementation of these indicators.

LGBTQIA+ advocacy groups particularly welcomed the inclusion of gender issues in the vulnerability criteria but regretted that the report did not develop these issues further, particularly regarding trans-identity. They point out that the dichotomous nature of the gender variable is not the only problem encountered. The fact that the measurement of gender or sex is fixed in time means that transgender patients' gender changes cannot be recognized. They proposed the adoption of two variables, a "sex assigned at birth" variable and a "gender" variable, which would make it possible to differentiate between these two concepts. Some stakeholders also regretted that none of the vulnerability criteria selected related to socio-economic status. Mental health stakeholders regretted the absence of a vulnerability criterion to identify patients suffering from psychiatric pathologies. Finally, feedback from a nursing association noted that the expert group would have been more representative if it had included nursing experts.

Limitations of the pilot study

The results of this pilot provide insights into the availability of data from which indicator values can be extracted but should be interpreted with caution. This pilot focuses on data availability but did not assess the quality of available data. Some of our experts who have worked at the clinical level in the pilot hospitals tell us, for example, that the quality of the allophone variable is questionable. Indeed, the local language is often chosen by default when the patient does not speak another national language. This leads to a classification bias and would negatively impact the quality of the equity analyzes produced by these indicators. Similarly, structural indicators such as the existence of an interpreting service are not very informative without the presence of outcomes indicators. For example, some translation services are rarely offered to patients because the cost of these services must be borne by the hospital. This pilot therefore aims to demonstrate the availability of data but analyses of the data quality as well as the concrete level of equity of the hospitals studied must be carried out.

Political implications and future steps

A first step in equity monitoring is already feasible based solely on data routinely collected by Swiss hospitals and the ANQ. It is therefore possible to encourage hospitals to use these indicators to allow comparison and benchmarking between hospitals, highlighting effective strategies to improve equity and areas that could benefit from more investment. Infrastructures such as SPHN (Swiss personalized health network) (43) can make it possible to assess equity indicators via data shared in a de-identified manner at the Swiss level. This would allow centralizing the work and prevent small hospitals from having too much of a burden to provide the indicators on a regular basis. Some institutions like the USZ are already demonstrating a better collection of routine indicators. But others such as the HUG or Mendrisio show less good coverage of the data needed to measure the indicators.

Specific variables allowing the assessment of populations in situations of vulnerability are not measured. For example, the ANQ patient satisfaction data are anonymous and therefore do not allow the construction of equity indicators stratified on risk groups, as they do not provide information on patients. To address this, it would be necessary either to collect patient satisfaction in each institution with the risk of a lack of standardization due to the varied choices of satisfaction questionnaires, or to modify the method of collecting satisfaction data by the ANQ, i.e., by allowing a link between satisfaction data and personal patient data. Other examples are the "homeless" status that is often missing or gender that is always recorded in two categories far from the reality of the gender spectrum with which LGBTIQ+ patients identify. This lack of information could be filled by increasing the recording of patients related variables that aren't strictly medically relevant. One possibility could consist in opening a debate with the populations exposed to the risk of inequity to better understand where the limit lies between their private lives and the recording of information in order to assess possible inequities.

Once the indicators are operationalized in the hospitals, we will be able to highlight the institutions that perform better on specific indicators. Research on the data quality and concrete inter-hospital equity situations will then be necessary to better understand the factors facilitating their success and will offer options for improvement to other Swiss health institutions.

This project has triggered a real interest from the research community, which is encouraging for the future of equity and quality of care in Switzerland. The current momentum should encourage all actors in the field to assess equity using these newly developed indicators.

In conclusion, this project illustrates the immediate feasibility of measuring equity of care in Switzerland but also raises points that should be explored to achieve a better understanding of inequities in a clinical context:

– The patient satisfaction data collected by the ANQ is not yet stratifiable on vulnerability criteria.

– Certain patient data such as gender on a spectrum or homelessness status are not collected and the inequities linked to these vulnerability criteria are therefore unmeasured.

– The availability of data to build the indicators reflects neither the real equity nor the quality of the data, particularly for the language spoken.

– This first list of indicators offers only a limited view on equity and will certainly have to be extended.

All the material produced is freely available with this report: the indicator sheets, the complete list of indicators and vulnerability criteria and their evaluation, and the themes that were not retained. By doing so, we hope to facilitate all projects that aim to measure or improve equity and to build together a more equitable and therefore more qualitative healthcare system for Switzerland.

Appendices list:

– Appendix 1: Search strategy for the literature review

– Appendix 2: Brochure for the recruitment of taskforce experts

– Appendix 3: Set of REDCap questionnaires used for the Delphi voting phases

– Appendix 4: List of all proposed indicators and vulnerability criteria

– Appendix 5: Proposed themes

– Appendix 6: Indicator sheets

– Appendix 7: Questionnaire of structure indicators

– Appendix 8: List of partners contacted for the pre-consultation

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