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Health Reform Monitor

Service-, needs-, and quality-based hospital capacity planning – The evolution of a revolution in Switzerland☆

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ABSTRACT

Most developed countries spend a large amount of their health budget on hospital capacities and inpatient services. However, those capacities and services are often not comprehensively planned what leads to vague service delivery steering and non-need driven hospital facilities. Switzerland is different as the planning procedure was completely reformed in 2012 and is further refined in 2021/2022. The Canton of Zurich, the frontrunner in Switzerland, has made a comprehensive update of its hospital capacity planning model for acute, psychiatric, and rehabilitative care. The result of this model is the hospital list. This list includes all hospitals which fulfill predefined quality, efficiency, and need requirements. Hospitals on the list receive a mandate to provide inpatient treatments for specific and selected service groups ($n = 196$), clustered in three areas (acute care, psychiatry, rehabilitation). The underlying health care policy process is transparent and is characterized by a high participation of all relevant actors. The building blocks of the planning model are a classification system of service groups, different quality and efficiency requirements attached to these groups, and an analysis of current and future need for health care. Hospitals which are willing to perform services must apply and demonstrate that the requirements are fulfilled. The canton then decides needs-based which hospital can deliver which services.

Purpose or idea of the policy

Increasing pressure on health budgets as well as substantial quality variation among hospitals, require a well-designed hospital landscape and related hospital capacity planning approach. International health systems are very different in their design. Thus, there are different approaches and levels how to plan hospital capacities [1–9]. In Germany, for example, planning is done at the federal state level [10]. Denmark, on the other hand, follows a strongly centralized approach [11]. Such differences and lack of transparency make it difficult to compare different hospital capacity planning processes and their components [1]. The transferability of one country's hospital capacity planning model to another country and thus the occurrence of learning effects is therefore barely possible.

However, the Canton of Zurich in Switzerland developed and applied a comprehensive hospital capacity planning model (HCPM) in 2012 with the main objective to provide needs-based, high qualitative, efficient (i.e., financially affordable in the long term), and geographically accessible inpatient health care. The HCPM is detailed, clear in its structure and transparent. Moreover, it allows for a high degree of entrepreneurial freedom of health care providers. It is thus smoothly transferable to foreign health systems. Almost all other Swiss cantons adopted the Zurich hospital capacity planning model. Throughout 2021/22, this model was further developed.

Many countries use a bed-related planning approach [12] with the major disadvantage that a hospital bed itself is a rather poor measure for a hospital's capacity. It is much more important what kind of medical services, which quality requirements, and which personnel and technical resources are associated with a bed. Therefore, more granular approaches, taking into account the high variability of hospital services and patient needs have to be considered.

This is reflected in the main element of HCPM, the groups of hospital

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services (Spitalplanungs-Leistungsgruppen, SPLG). Each SPLG is clearly defined by specific diagnosis (ICD-10-GM) and procedure codes (Schweizerische Operationsklassifikation, CHOP) [13] and each hospital case is linked to one service group.

The main characteristics of the HCPM are (a) transparency of contents and public availability of all related materials, (b) an easily understandable structure of the political process, and (c) the involvement of all health care actors and the possibility of participation for all, who are interested and affected. In fact, all aspects of the TAPIC framework (Transparency, Accountability, Participation, Integrity and Capacity) are considered in the HCPM of the Canton of Zurich [14].

The result of the HCPM is a hospital list for the Canton of Zurich. This list includes all hospitals which fulfill predefined requirements attached to the service groups and thus received a mandate to provide inpatient treatments. The list does not only include hospitals from the Canton of Zurich, but also hospitals from other Cantons which successfully applied to the Zurich cantonal department of health for a mandate.

Cantons and health insurances pay for hospital services on case level based on national tariffs (Swiss-DRG). Treatment mandates received by a hospital are binding and prohibit hospitals from providing treatments or diagnostic services beyond the mandate. In case of service provision without a mandate, the canton is not obliged to pay the cantonal part of the remuneration or can reclaim payment if it has already been paid. In addition, the canton has to inform the health insurance company of the patient about the violation of this rule.

All acute care, psychiatry, and rehabilitation hospitals in the Canton of Zurich are highly affected by the HCPM. First, the hospitals must individually evaluate all general and specific requirements of the groups of services. Second, the hospitals must decide which specific groups of services they want to provide and apply for the respective mandates. This process enables the hospitals to formulate a medical strategy.

In 2009, there was a revision of the Federal Health Insurance Law commissioned by the Federal Council of Switzerland. An empirical investigation of the revision has revealed that the associated increase in transparency, the extended hospital choice, and mandatory and regulated hospital planning have contributed to an improvement in the quality of hospital services [15,16]. The HCPM is an example of transparent and detailed planning of hospital capacities. Further, studies showing a positive volume-outcome relationship for a broad range of services [17–19]. The HCPM uses the minimum volume instrument as a quality criterion and explicitly requires it in specific service groups on hospital and physician level.

The cantons are responsible for hospital capacity planning in Switzerland. The HCPM from the Canton of Zurich is however well recognized at the national level. The gained experience lead to the recommendation of the Conference of the Cantonal Ministers of Public Health (Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren, GDK) for other cantons to implement this model of hospital capacity planning. Now, 24 of the 26 cantons of Switzerland use the SPLG classification in the hospital capacity planning (e.g., Canton Basel City and Basel Country [20]). The fact that the most cantons voluntarily apply the Zurich model for acute care is a powerful argument in favor of the model. The structure of the SPLG classification is the same in each canton, however the process of awarding mandates for hospital services differs between the cantons.

To the best of our knowledge, there is no literature available that describes the hospital capacity planning of a country in comparable detail. Further, the granularity of the Swiss planning approach makes the approach also interesting for other countries. Even though the hospital capacity planning model from Zurich is very specific, hospitals are regarded as individual economic subjects and are given a lot of entrepreneurial freedom. Lastly, each hospital is free to decide in which medical areas it intends to be active and where it intends to build up capacities. Hospitals are also free to cooperate with other hospitals. Thus, the principle of self-responsibility, which is important in Switzerland, is anchored here. These three arguments highlight the added value and contribution of our paper.

Political and economic background

Switzerland has a highly decentralized health system [21,22]. The responsibilities on national and cantonal level are determined by the Federal Health Insurance Law (Krankenversicherungsgesetz, KVG) [23]. This law also regulates the principles of health service provision. It further lays down the responsibility of all 26 Swiss cantons to provide hospital planning. The cantonal departments of health are in charge to develop, implement, and coordinate hospital planning according to the planning criteria of the Federal Council. The Canton of Zurich has a population of approximately 1.5 Million people and is therefore the largest canton of Switzerland [24].

On the one hand, the cantonal department of health is the legal organization which performs the hospital planning and mandates the hospitals to provide services. On the other hand, the cantonal department of health is responsible for paying 55% of the inpatient treatment cost. The other 45% are paid by health insurance companies. Thus, the cantonal department of health fulfills a dual role. However, it also incentivizes the canton to develop a sustainable and efficient hospital landscape.

Until the end of the last century, an increase in capacity was the focus of the hospital capacity planning, whereas treatment quality was not a specific concern [25]. The increased hospital capacity and the extended hospital services supply led to an increase in service provision and subsequently health care costs. At the end of the last century, hospital cost containment and an increase in the efficiency of the health care on the cantonal level thus came into the focus of health policy. Since the health care costs on the national level increased, the Federal Health Insurance Law (KVG) was implemented in 1996. Since then, the KVG requires needs-oriented hospital planning from the cantons. This shift of focus was independent of a change of government or change in the political direction of the Canton of Zurich. The KVG stipulated that the quality of treatment must be promoted, and that cost containment must be considered in hospital planning. Nevertheless, the hospital costs continued to increase and caused a KVG revision in 2007 [25]. The focus of the KVG adjustments is on the changes in the requirement for the hospital capacity planning and the implementation of the new hospital financing. The revision of the KVG stipulate that the new national hospital financing model based on diagnosis-related groups (DRG) must be developed and implemented. The SwissDRG AG, a non-profit organization on the national level, was established to develop the national DRG-based tariff structure. Whereas the hospital financing was implemented on the national level, the cantons remained responsible for the hospital planning.

Both, the Swiss-DRG system and the HCPM are based on the same classification systems for the description of the patient groups (ICD10-GM for the diagnoses and CHOP for the procedures). This is however the only common feature of the two systems. Otherwise, the two systems do not interact with each other because they have different purposes (financing and planning). The DRG system is used to assess the resource consumption auf diagnosis-related patient groups and subsequently reimburse hospital services. The SPLG system is used for hospital capacity planning. The cantonal department of health of Zurich also already stated in 2012 during the first implementation of the HCPM that there can be no connection. The SPLG is about the medical homogeneity and hierarchy of services. For DRG, the medical and economic homogeneity of the groups is essential. It is also important to mention that there is no connection between investments in hospital infrastructure and “needs projection”. Hospitals must ensure investments via revenues from hospital payments. For regional political reasons, cantonal authorities are allowed to implement supportive hospital financing [26,27].

Table 1
Components of HCPM.

Main components of HCPM	Main contents	Specific Contents
Classification system of the groups of hospital services (SPLG)	Acute care	Further development of the SPLG classification in acute care (149 SPLGs)
	Psychiatry	New development of the SPLG classification in psychiatry (25 SPLGs)
	Rehabilitation	New development of the SPLG classification in rehabilitation (22 SPLGs)
An analysis of current health care needs and a forecast of future health care needs	Analysis of previous health care needs	Analysis of inpatient cases with the newest databases. Presentation at the levels of service areas, age groups and region of residence
	Projection of health care needs for the next period	Demographic projection Analysis of the developments in medical technology Epidemiological evaluations Analysis of the tariff structure and regulatory framework development Evaluation of transfer of treatments from inpatient to the outpatient service area Discipline and SPLG specific factors
Evaluation criteria	Quality	General requirements independent of the range of services Specific requirements for each hospital planning service groups
	Economic efficiency	Cost efficiency Economic stability Liquidity planning
	Treatment accessibility	Accessibility of treatments at the right place within a previously determined time Differentiation between scheduled treatments and emergency admissions

Source: Authors' own illustration.

Health policy processes

In 2008, the GDK published recommendations for hospital planning on the cantonal level by means of guidelines and hospital planning criteria. This was the starting point for the cantonal department of health to develop the HCPM in accordance with the requirements of the revised KVG and the guidelines of GDK. In 2012, the initial HCPM came into force. In 2018, the GDK actualized the guideline from 2008 [28] which lead to the current revision process of the HCPM. The guideline defines fifteen criteria for the cantonal hospital capacity planning approaches. The Canton of Zurich defined seven of these as main criteria, whereas the other eight criteria are considered further criteria (see Figure O.1 in the Online Appendix).

In 2018, the cantonal government instructed the Zurich department of health to replace the 2012 hospital lists for acute care, psychiatry, and rehabilitation with a new hospital list for the year 2022 [29]. The deadline was later postponed to 2023 [30]. The revision process started when the Zurich government instructed its department of health to update the HCPM and to develop a vision and strategy for the next ten years [29–31]. In the next step, a preliminary version of the "Health care report and supplements" [32,33] is made publicly available. For a two month consultation period, all interested health care actors were able to comment on it [34]. After the public consultation, the final version of the "Health care report and supplements" has been published. This final version is the binding basis for the hospitals' applications to receive a mandate for specific service groups. Afterwards, hospitals plan individually which medical areas they want to cover. More specifically, they consider which service groups they can and want to provide according to service group specific requirements. Once the hospital's internal medical strategy is defined, the hospitals apply for the mandates to provide service groups. After the hospitals have submitted their applications, these are evaluated by the Canton of Zurich department of health. The criteria of the evaluation are published in "Health care report and supplements" and described in Table 1. As a result of this evaluation, the "Structural report" is produced and published. The "Structural report" contains the provisional hospital list, which is a summary matrix of mandated service groups and hospitals. In the following public consultation, health care actors can file a complaint against the "Structural report". At the end of this consultation process, the Canton of Zurich government issues a final hospital list. This hospital list basically determines the provision of hospital services over the next ten years. Small adjustments of the list are possible every year. Possible reasons are potential changes in the specific quality requirements for selected service groups. Fig. 1 illustrates the health policy process in the Canton of Zurich connected to the HCPM.

Content of reform

The vision and strategy of the Canton of Zurich department of health at the beginning of the HCPM process formulates its long-term goals. The "Health care report and supplements" describes the approach and lays

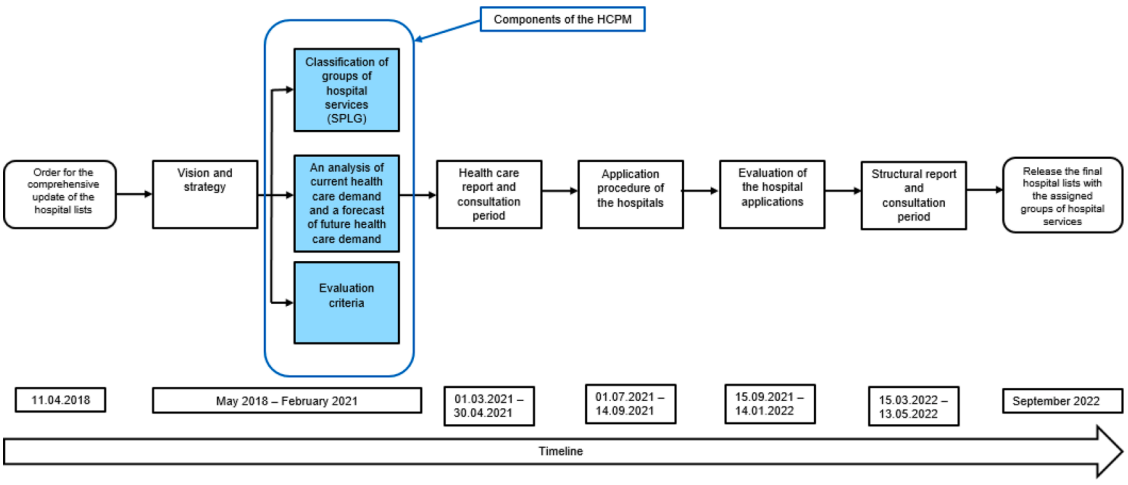

Fig. 1. Illustration of the process of HCPM in the Canton of Zurich. Source: Authors' own illustration.

down the three main components of the HCPM reform: (a) a classification system for the service groups, (b) an analysis of the current and a forecast of health care needs, and (c) the evaluation criteria for the hospitals' applications. These components are listed in Table 1.

One of the most important modules is the classification system of inpatient cases to service groups for acute care, psychiatry, and rehabilitation. For the hospital planning model, the Zurich department of health developed a grouper software in 2012, which clearly assigns a specific case to one single service group. The development was carried out in close collaboration with specialists of different medical societies. The grouping algorithms are based on the ICD-10-GM, and CHOP (Swiss Operation and Procedure Catalogue) procedure codes. There are 149 SPLGs in acute care, 25 SPLGs in psychiatry, and 22 SPLGs in rehabilitation. While the initial service groups for acute care were further developed, those for psychiatric and rehabilitation services were newly established. The department of health of the Canton of Zurich visualizes the medical hierarchy as a pyramid when describing the structure of the service groups (see Figure O.2 in the Online Appendix) [35,36]. The prerequisite for a functioning hospital is that basic care can be guaranteed at all times. Therefore, two different basic packages are defined for this purpose: The basic package for medical and surgical services, and the basic package for specialized elective care providers. These are the basis for the provision of medical and surgical services within other more specialized service groups. The higher levels in the pyramid go hand in hand with higher specialization and higher requirements for service provision.

Another important component of the HCPM is the needs forecast. The approach is data driven. Several data sets were used for the development, among them: (a) medical statistics for all inpatient cases in acute, psychiatric and rehabilitation institutions of the Federal Statistical Office; (b) demographic data of the Cantonal Statistical Office; and (c) the Population and Households Statistics (for the calculation of the rates of hospitalization) of the Federal Statistical Office. For the analysis of current health care needs and a forecast of future health care needs, different demographic projection methods were used. For this purpose, the previous development of needs projection is analyzed based on the inpatient cases of the most recent available data year. These results are presented at the levels of service areas, age groups and region of residence. The needs-projection in fact informs the assignment of service group mandates to the hospitals.

To ensure a transparent procedure in the mandating of service groups, evaluation criteria from the areas of quality, efficiency, and accessibility have been predefined. The quality criteria are divided into general requirements independent of the range of services (e.g., documentation, patient management, quality management, hygiene management, etc.) and specific requirements for the different service groups (e.g., minimum case numbers of services, certifications, staffing, intensive care levels, etc.). The comprehensive system of indicators to the cost efficiency, economic stability, and liquidity planning addresses the economic stability of hospitals. The accessibility of treatments at the right place within a previously determined time is another important evaluation criteria. In this regard, a distinction is made between elective treatments and emergency admissions.

The area of highly specialized medicine (HSM), i.e., heart transplantations, cochlear implants, is an exception. This area is regulated by separate, nationally uniform and very high requirements (e.g., demonstrating research and teaching activities within HSM service groups). HSM is concentrated in a few university hospitals and multidisciplinary centers. This is SPLG-based and carried out through close cooperation between the cantons. 24 of 196 service groups are within the area of HSM. Thus, it takes place at the intercantonal level and has its own decision-making bodies for this purpose [37].

Expected or preliminary outcomes

Many expectations are associated with the updated Zurich approach of the hospital capacity planning model. These expectations are placed on national, cantonal and health care provider level. Since the HCPM was extended to the psychiatric and rehabilitation care, the expectation on the national level is that the model will succeed. In this case, it is likely that other cantons will follow the Zurich example and that the planning model will be extended to other areas of care.

The cantonal government of Zurich expects the health care system to be more efficient and needs-based and to lead to a better usage of limited resources in the hospitals[25,38].

The preliminary results of the HCPM have been published in March 2022. We summarize the results for the acute care sector below [38]:

A further development of service groups will take place; concentration of service mandates and hospital concentration are expected to increase [39]. The further development of service groups is driven by the implementation of new and strengthening of existing quality requirements (e.g., quality programs, indicators and certificates for quality), developments in medical technology, and introduction of general needs driven new services (e.g., newly introduced service contracts for midwife-guided birth). Service groups for severe cases are assigned to a small number of specialized hospital centers. For example, non-complex cerebral strokes are treated in the service group NEU3 and assigned on the cantonal level. However, complex cerebral strokes, which also require complex treatments, are assigned through NEU3.1 at the national level. NEU3.1 has higher quality requirements of care than NEU3. While 15 hospitals were allowed to provide stroke treatments in NEU3 before 2023, only 7 hospitals are expected to be allowed to provide these treatments after 2023.

The number of hospitals that are allowed to provide inpatient care is intended to be reduced. There are currently 24 hospitals on the 2023 hospital list. Of these 24 hospitals, 21 hospitals were already on the 2012 hospital list and renewed their service mandate. An example for a new hospital on the list is a birth center with the newly introduced service group of midwife-guided birth. There are also different reasons why hospitals are no longer on the list: One hospital (Adus Klinik) did not receive a mandate despite applying and is no longer represented on the hospital list. Consequently, this hospital does not provide any primary care services any longer. One hospital (Affoltern) has only received a limited number of service mandates for the next 3 years. The reason is that this hospital does not significantly contribute to regional healthcare provision. Its structure is not sufficiently future oriented, quality assurance got increasingly difficult, and the hospital only made a small contribution to the coverage of population needs. Another hospital (Uster) has only received a provisional assignment of service mandates for the next 3 years. This hospital has achieved only low efficiency and its economic stability is unclear. In addition, a hospital with the same spectrum of services is located in its proximity. The hospital's past efforts to merge with another hospital had failed [38].

The success rate of the hospital's applications to receive a mandate depends on the service group. For example, in DER1 (dermatology) the success rate was 100%, in NEU3 (neurology) the success rate was 77% [38]. Hospitals may not be satisfied with the assignment of service mandates. In this case, they can submit an official complaint to the Federal Administrative Court. The decisions of the respective courts with regard to service group allocations are published on the homepage of the GDK [40]. Similarly, it is possible that the population of a certain region is unsatisfied if a hospital is no longer listed. However, because the entire hospital planning process, including the methodology and evaluation criteria, is transparent, the department of health can justify its decisions in a comprehensible way. In addition, all stakeholders can participate in a public consultation on the structural report [38].

The department of health at the cantonal level is entirely responsible for the development and implementation of the hospital planning [23]. Strictly speaking, the cantonal departments of health are not obliged to permit the participation of other stakeholders in the health care sector and to collaborate in hospital planning. They could all alone determine evaluation criteria and assign mandates for service provision.

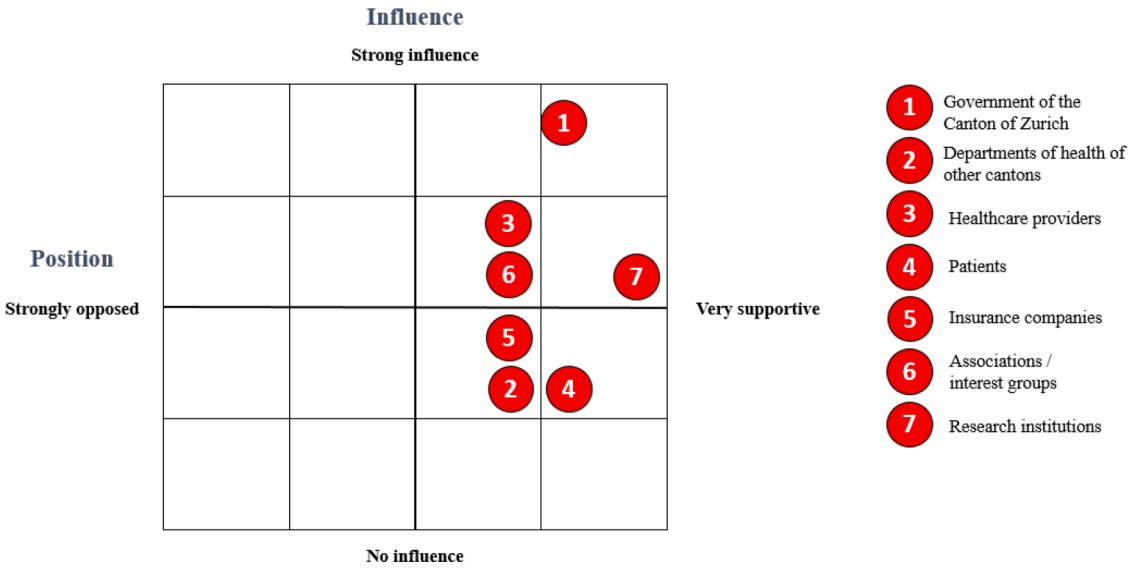

Fig. 2. Stakeholder analysis – Hospital Capacity Planning Model from the Canton of Zurich.

Nevertheless, in order to increase the extent of long-term acceptance of all stakeholders, the entire hospital planning process is highly transparent, understandable, and participative [41].

The departments of health of most Swiss cantons are very supportive of the Zurich hospital capacity planning model [28]. One advantage is that they are allowed to use, adapt, and implement the HCPM, which corresponds to the fundamental principles of hospital planning as stipulated by the KVG. Another advantage is the potential for personnel costs savings that would occur in case of an own development of a hospital planning model.

The health insurers also support the HCPM [42].They participate actively in the consultation process with proposals for further development of the efficiency indicators and expansion of the quality criteria. However, they also call for more data-based analyses of the model.

The interest groups and associations, especially those representing patients, would like to see a more pronounced expansion of the quality requirements for hospitals [42]. At first sight, the patients themselves have no influence on the hospital planning process. However, the hospital choice of patients is analyzed retrospectively and directly impacts the hospital planning process of the next periods [42].

Hospitals can decide which service groups they apply for. However, the department of health controls the allocation of the mandates. Since the process is transparent and hospitals have entrepreneurial freedom, the majority of hospitals support the capacity planning [42]. For a better understanding of stakeholder positions we describe them in the Fig. 2.

Conclusion

In acute care, the service groups as an integral part of the HCPM are already well established. They have been further developed and the probability of success is high. In psychiatry and rehabilitation, however, the classification is new. Through the close collaboration with physicians of all medical disciplines and the high grade of participation, the implementation of the HCPM is also expected to be successful. To be prepared for the HCPM, the hospitals are expected to form alliances or collaborations with other hospitals to achieve the requirements of the groups of hospital services. The purpose of such alliances can guarantee minimum case numbers for specialized services.

For those involved in the design, development, and implementation of hospital planning, the Zurich Model can be very inspiring because of its comprehensiveness, structure, and high understandability. The requirements of needs-based, quality and efficiency-oriented hospital capacity planning are successfully included in the HCPM. International health care policy makers can also benefit from the design of the transparent and highly participative health care policy process (from the formulation of the strategy to the implementation of the hospital capacity planning model). The Zurich HCPM has been demonstrated to have good transferability. For example, the model has been used as a basis in North Rhine-Westphalia, the largest federal state in Germany [43].

In summary, it can be expected that a needs-based, high qualitative, efficient, and accessible healthcare provision is ensured during the next 10 years in the Canton of Zurich. The hospital capacity planning model can also be a reliable basis for adaptation and further development in an international setting.

Declaration of Competing Interest

Each named author has contributed to conducting the underlying research and drafting this manuscript. Additionally, the named authors have no conflict of interest, financial or otherwise.

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Supplementary materials

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