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## What drives regional heterogeneity in hospital capacity planning? A qualitative study investigating the perspectives of Swiss cantons

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**Carla Walker, Charlotte Schneider, Daria Bukanova-Berend, Katharina Lonnes, Dr. David Ehlig, Dr. Justus Vogel, Prof. Dr. Alexander Geissler**



# Working Paper Series in Health Economics, Management and Policy

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# What drives regional heterogeneity in hospital capacity planning? A qualitative study investigating the perspectives of Swiss cantons.

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## **Authors:**

Carla Walker

Research assistant

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[carla.walker@unisg.ch](mailto:carla.walker@unisg.ch)

Charlotte Schneider

Research assistant

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[charlotte.schneider2@unisg.ch](mailto:charlotte.schneider2@unisg.ch)

Daria Bukanova-Berend

Research assistant

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[daria.bukanova@unisg.ch](mailto:daria.bukanova@unisg.ch)

Katharina Lonnes

Master student

University of St.Gallen

[katharina.lonnes@student.unisg.ch](mailto:katharina.lonnes@student.unisg.ch)

Justus Vogel

PostDoc/ Scientific Project Leader

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[justus.vogel@unisg.ch](mailto:justus.vogel@unisg.ch)

David Ehlig

PostDoc/ Scientific Project Leader

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[david.ehlig@unisg.ch](mailto:david.ehlig@unisg.ch)

Alexander Geissler

Professor

Chair of Health Economics, Policy, and Management, School of Medicine, University of St.Gallen

[alexander.geissler@unisg.ch](mailto:alexander.geissler@unisg.ch)

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# What drives regional heterogeneity in hospital capacity planning? A qualitative study investigating the perspectives of Swiss cantons.

Carla Walker\*, Charlotte Schneider\*<sup>c</sup>, Daria Bukanova-Berend\*, Katharina Lonnes<sup>†</sup>, Dr. David Ehlig\*, Dr. Justus Vogel\*, Prof. Dr. Alexander Geissler\*

\* Chair of Health Economics, Policy and Management, School of Medicine, University of St. Gallen, St.-Jakob-Strasse 21, 9000 St. Gallen, Switzerland | <sup>†</sup>University of St. Gallen, Dufourstrasse 50, 9000 St. Gallen, Switzerland | <sup>c</sup> Corresponding Author

## **Declarations**

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### **Conflict of interest**

None.

### **Author contributions**

Carla Walker: Conceptualization, Methodology, Formal analysis, Data curation, Interpretation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project administration; Charlotte Schneider: Conceptualization, Methodology, Formal analysis, Data curation, Interpretation, Writing – Review & Editing; Daria Bukanova-Berend: Methodology, Data curation, Writing – Review & Editing; Katharina Lonnes: Data curation, Writing – Review & Editing; David Ehlig: Conceptualization, Methodology, Writing – Review & Editing; Justus Vogel: Conceptualization, Methodology, Writing – Review & Editing; Alexander Geissler: Conceptualization, Methodology, Supervision, Writing – Review & Editing

### **Ethics approval and consent to participate**

Not applicable.

### **Consent for publication**

Each interview participant signed a consent for publication.

### **Data availability**

Stakeholder interview data is not available, as the participants did not give consent for this. Hospital lists, general and service-specific requirements were obtained from cantonal websites and through e-mail requests, anonymized copies of which can be provided by the corresponding author upon request.

## **Abstract**

Background: Hospital capacity planning can help to balance quality, cost-effectiveness, and accessibility of inpatient services. Achieving all three objectives equally is complex and requires a balanced and targeted approach. Moreover, the implementation of a national reform in this field in decentralized health systems is challenging.

Objectives: This study explores how Swiss cantons (federal states) have implemented the national reform of hospital capacity planning, focusing on the factors that contribute to regional variation. As hospital capacity planning is attracting attention internationally, we aim to inform other countries on possible implementation approaches for centrally mandated reforms carried out within decentralized health systems.

Methods: We conducted a document analysis of official cantonal materials, including hospital lists and mandates from 2012–2025. Additionally, 25 semi-structured interviews with cantonal representatives and experts were transcribed and analysed using inductive and deductive coding techniques.

Results: Swiss cantons have mostly aligned their hospital capacity planning methods, especially in defining service groups and assessing need for care, following the model developed in Zurich. Differences still exist in how they apply specific requirements, such as minimum volume thresholds, which are affected by political pressures and cantonal priorities. While some cantons adopted the reform to boost quality and centralize services, others faced challenges like limited inter-cantonal collaboration, resource constraints, and the dual role of cantons as regulators and hospital owners.

Conclusion: Despite formal autonomy, the widespread adoption of Zurich's planning tools has standardized key aspects of hospital capacity planning across cantons. The Swiss experience demonstrates that decentralized systems can achieve methodological convergence without strict national mandates, provided strong regional models exist. For other decentralized health systems, these findings highlight the importance of balancing national guidance with evidence-based regional flexibility, standardizing quality requirements, reducing political influence on decisions, and fostering collaboration to ensure equitable, high-quality hospital services.

## Background

Planning of hospital capacities and service mandates needs to balance quality of hospital care, cost-efficiency, and accessibility [1–3]. The provision of economically viable and high-quality services necessitates a certain level of concentration, driven by the volume-outcome relationship and economies of scale, which may, however, limit access to hospital services. Furthermore, planning constraints are influenced by geographical and demographic factors, such as urban versus rural areas, as well as the nature and type of services provided, including elective versus emergency care. Consequently, effectively balancing quality, costs, and accessibility presents a complex challenge that requires a sophisticated and targeted approach to hospital capacity planning [3, 4].

Internationally, hospital capacity planning models (HCPM) exhibit considerable variation influenced by national health objectives, political responsibilities, and regulatory frameworks. [5, 6]. Several countries, including Belgium, Luxembourg, Finland, Germany, Norway, Slovakia, and Sweden, are currently implementing structural changes to improve their HCPM [7–9], the approaches vary significantly based on the different characteristics of the health systems.

Countries such as Denmark, Luxembourg, Belgium, France, and Poland demonstrate a centralized approach to hospital capacity planning [1, 10–12]. In 2023, Luxembourg took a significant step towards centralizing healthcare planning, legislation, and financing by merging two ministries [9]. Denmark's health reform implemented in 2007, exemplifying an evaluated reform, notably diminished the number of service mandates and hospital capacities, with an emphasis on specialized care at a smaller number of locations. Assessments have demonstrated that the reform enhanced patient outcomes, including decreased mortality rates, and realized efficiency improvements, such as reduced hospital stays, while preserving a high level of public trust, albeit with a slight increase in patient travel times. [10, 13].

On the other hand, countries like Germany [8], Italy [14], and Spain [15] adopt a decentralized approach where states or health regions manage hospital capacity planning. Decentralized health planning structures theoretically offer increased local authority and accountability, allowing for more effective response to local healthcare needs [16]. In Switzerland's decentralized health system, health policies

and reforms are designed and legislated at the federal level. Nevertheless, the 26 autonomous cantons of Switzerland, which are legal administrative entities delineating the country into smaller spatial regions analogous to states in other decentralized systems [17], bear the responsibility for implementing such reforms, including the specific delineation and enforcement of binding regulations [3, 17, 18].

Switzerland's HCPM was reformed through the revision of the Health Insurance Act (KVG) 2007, introducing not only a Diagnosis-Related Group (DRG)-based payment system but also mandating cantons to implement hospital capacity planning by 2012, with a transitional period until the end of 2014. The reform shifted the HCPM from a resource- and capacity-oriented approach to a service-, needs-, and quality-based approach [3, 19]. Since 2012, highly specialized services have been coordinated at the national level under the Intercantonal Agreement on Highly Specialized Medicine (IVHSM) [20], whereas responsibility for assigning care mandates for all other hospital services remains with the cantons, based on current and projected need for care and subject to defined quality requirements [3]. As part of this transition, the Canton of Zurich played a key role in developing the new HCPM, which is based on hospital planning service areas (SPLBs) divided into hospital planning service groups (SPLGs) [3, 21]. Each service group comes with specific requirements, including the availability of appropriately qualified specialists, provision of emergency and intensive care, minimum case numbers, necessary interdisciplinary cooperation and tumor boards (see Appendix 1. Overview of different requirements from Zurich's 2025 definition (an English translation)). Basic services must be available in every hospital, while more complex or specialized services require additional organizational and staffing prerequisites. The result of the HCPM is a hospital list for the Canton of Zurich, which includes all hospitals that fulfill the predefined requirements and thus receive a mandate to provide inpatient treatments. The list does not only include hospitals from the Canton of Zurich, but also hospitals from other cantons that successfully applied to the Zurich Department of Health for a mandate [3, 22].

While the Zurich HCPM has been presented and discussed in prior studies [3], there remain gaps in understanding the implementation of the reform in the remaining 25 cantons. Additionally, despite

ongoing health system reforms in many countries, there remains limited cross-country knowledge exchange regarding the actual implementation of health system reforms in decentralized health systems, specifically what factors influence the degree of variation in implementation across regions [7]. This study fills the gap by exploring how a federal hospital reform was carried out at the subnational level and by analyzing the reasons for variation in implementation across subnational governments, drawing on evidence from the Swiss hospital capacity planning reform. It additionally seeks to provide insights for other decentralized systems facing comparable HCPM reforms.

## **Methods**

### **Document Analysis**

First, we conducted a comprehensive document analysis [23] for all cantons of historical and current hospital lists available on cantonal websites to identify differences in planning approaches, service group definitions, and related requirements. Historical hospital lists date back to 2012, with current versions covering 2015 to 2025. Additional cantonal materials, including general and service-group-specific requirements, along with analyses and forecasts on the need for care, were also examined (see Appendix 2. Sources for cantonal HCP or detailed sources). Data extracted from the documents were systematically collected and descriptively analysed in Excel to enable inter-cantonal comparisons. The dataset comprised reviewed variables including the year and version of the most recent hospital list, planning horizons, the number of hospitals, care mandates, and SPLGs (see Appendix 3. Overview of cantonal characteristics). In addition, each canton's planning approach was assessed in relation to the most recent Zurich model, taking into account both general and service-specific requirements.

### **Interviews**

The document analysis was complemented by 25 semi-structured interviews with cantonal representatives (N=20) responsible for hospital capacity planning, and experts in the Swiss HCPM (N=5). The goal of the interviews with cantonal representatives was to grasp how the reform was carried out at the cantonal level. (see Appendix 4. Interview Guide Cantons). The interviews with experts aimed to gather additional insights from a nationwide viewpoint (see Appendix 5. Interview Guide Experts).

All 26 cantons were contacted by email and invited to participate. Twenty cantons agreed to be interviewed, while six declined, mainly citing capacity constraints. Among the latter, one canton returned the interview guide with written responses, and the remaining five provided written information on the timing of the KVG revision and on whether, and when, they adopted the Zurich HCPM approach. In addition, two of these cantons supplemented their written input with information provided during a 15-minute call. Eight cantons also shared additional documents with general and service-group-specific requirements.

#### *Data Collection Procedure*

The document analysis and research questions build the basis for the development of the interview guides for the experts and the cantonal representatives. The guides were developed in German and subsequently translated into French by a bilingual native speaker. The interview guide was shared with participants before the interviews. Interviews were conducted between September 2024 and June 2025 by at least one of the authors. Prior to the interviews, participants were informed of the voluntary nature of their involvement and their right to withdraw at any time without consequence. They provided written consent acknowledging that their responses would be recorded, transcribed, and anonymized for research purposes. Interviews were carried out using Microsoft Teams or telephone, based on participant preference. Each interview was audio-recorded and anonymized. They lasted between 45 and 60 minutes and were conducted in German (22 out of 25) or French (3 out of 25).

#### *Data Analysis*

Each interview was transcribed in its entirety. A qualitative content analysis [24, 25] was performed using ATLAS.ti (version 25.0.1). Interview material was deductively coded by two authors using predefined main categories derived from the core questions of the interview guide. During the coding process, additional codes and subcodes were developed inductively. Inter-coder reliability was assessed on four transcripts, showing a high level of agreement; minor discrepancies were resolved through discussion.

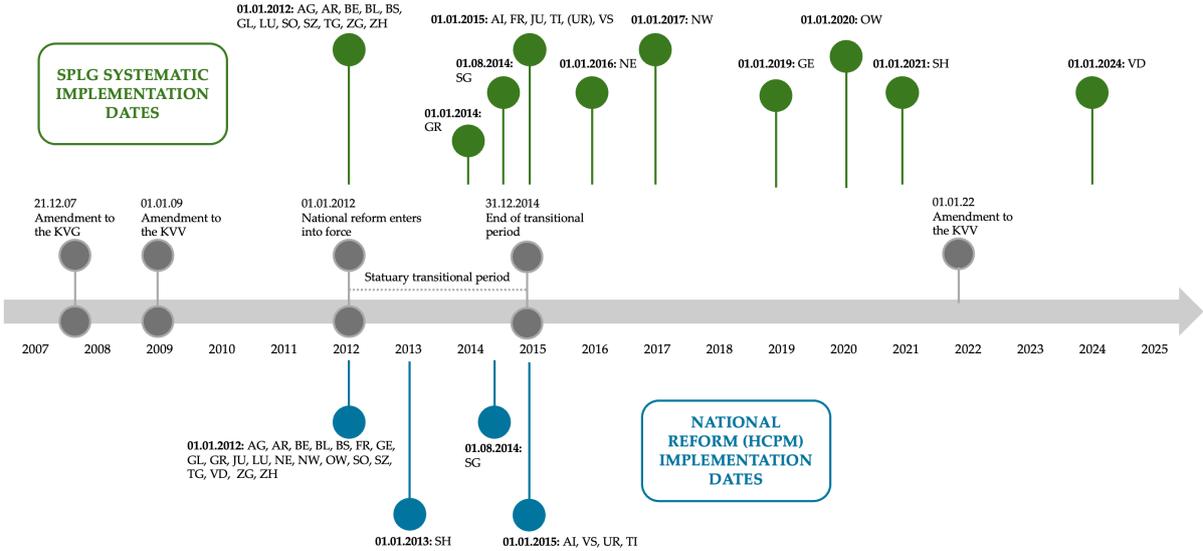
## Results

### History

In 2009, the amendment to the health insurance ordinance (KVV) took effect. The KVV is subordinate to the KVG and details and enforces the provisions of the KVG. While the federal law on health insurance ruled that the cantons shall coordinate their planning and that highly specialized medicine is jointly planned on a national level, the KVV in 2009 gave more details, including hospital capacity planning principles, what to consider for need-for-care planning, hospital lists, and service mandates. The amendment of the KVV in 2022 further reinforced hospital capacity planning by obliging cantons to make transparent the variables used to forecast need for care, evaluate economic efficiency, and assess quality based on proposed, but non-binding criteria such as qualified personnel, quality management systems, and minimum case volumes. In addition, it placed greater emphasis on coordination among hospitals and on the explicit assignment of service groups to each hospital mandate.[26].

The cantons were required to implement the federal law and the hospital capacity planning ordinance between 2012 and the end of 2014. Figure 1 shows, on which date each cantons implemented the national reform (indicated with the blue dots) and the SPLG systematic (indicated with the green dots). The SPLG method was created by an interdisciplinary team from Zurich and in collaboration with other cantons, starting in 2009 and becoming operative in 2012 (interview expert 1 and 2). All cantons have adopted the SPLG systematic developed by Zurich, with the exception of Uri (UR), which only assigns mandates at SPLB level. Twelve cantons implemented the SPLG systematic in 2012 along with Zurich. The remaining cantons adopted the systematic later, with Vaud (VD) being the last canton to adopt the SPLG systematic in 2024. Generally, French-speaking cantons adopted the model at later points in time than German- or Italian-speaking cantons (see Figure 1).

**Figure 1: Timeline of the KVG reform and SPLG implementation across cantons.**



Note : Abbreviations of the cantons can be found in the glossary. Grey dots indicate the national amendments to the KVG and KVV related to hospital capacity planning, green dots indicate the SPLG implementation dates across cantons, blue dots indicate the KVG implementation (hospital capacity planning) dates.

**Differences in need-for-care planning**

Cantons hold the responsibility to forecast the need-for-care for both residents and non-residents, balancing service provision, patient access, and hospitals’ ability to meet mandate requirements. Broadly defined criteria allow cantons to apply their own planning methods, guided by GDK recommendations that consider quality, cost-efficiency, demographics, epidemiology, medical advances and remuneration of health professionals. In case of oversupply, cantons are advised not to consider hospitals located outside their territory [27].

During the interviews, representatives from 15 cantons shared how they conduct need-for-care analysis. Most of these cantons follow general recommendations provided by GDK. Notably, demographic factors, such as aging population, its distribution between urban and rural areas, migration flows (in- and outflows), play a decisive role in need-for-care planning. Some cantons consider special requirements, such as seasonal fluctuations caused by tourist inflows. Furthermore, several cantons advance their forecasts through novel mechanisms. For example, Fribourg developed “volume dialogues” (“Mengendialog”) to identify oversupply and avoid it in the future, while Ticino developed a minimum market shares concept (“Mindestmarktanteile”) to address the same issue.

According to interviews with cantonal officials and experts, most cantons collaborate with third parties, like OBSAN (Swiss Health Observatory), to develop demand projections.

## Differences in the quality requirements

The definition and use of SPLG-specific requirements vary across cantons, which is shown in Table 1.

**Table 1: Differences in quality requirements across cantons.**

Canton	SPLG requirements in use	Number of SPLGs, N	Basic packages	Medical specialist qualifications	Availability of Medical Specialists	Emergency	Intensive Care Unit	Cooperation (inhouse)	Cooperation (inhouse or coop)	Tumour board	Minimum Volume
ZH	ZH2025	127									
AG	ZH2023	125									
AI	ZH2025	125									
AR	ZH2025	125									
BL	ZH2023	127									
BS	ZH2023	127									
BE	ZH2025	120									
FR	ZH2025	127									
GE	ZH2025	127									
GL	ZH2015	107									
GR	ZH2016	108									
JU	ZH2025	127									
LU	ZH2019*	115									
NE	ZH2015	107									
NW											
OW											
SH	ZH2025	127									
SZ	ZH2025	127									
SO	ZH2024	127									
SG	ZH2025	125									
TG	ZH2023	127									
TI	ZH2011	99									
UR											
VS	ZH2011	99									
VD	ZH2025	127									
ZG	ZH2020	116									

Note : Zurich serves as the baseline. For each canton, the version of the most recent requirement and the count of SPLG are shown.

Colour coding denotes: no colour = no deviation from Zurich; orange = difference from Zurich (older version of Zurich as basis); blue = difference from Zurich (deliberate modification ); grey = no information available.

The requirements for SPLGs vary across cantons for two principal reasons. First, fifteen cantons, such as Glarus (GL), Grisons (GR) and Ticino (TI), rely on earlier versions of the Zurich model (in Table 1, these deviations are marked orange). Second, cantons may make a deliberate modification to adopt requirements set out by Zurich (these deviations are marked in blue in Table 1). These two reasons are elaborated in more detail below. Additionally, there are no information available for certain requirements (marked grey in in Table 1).

### *Variation due to older versions*

Many SPLGs introduced in later updates simply do not appear in these cantons' frameworks. For example, Zurich's 2018 revision split "Reconstruction of the Lower Extremities" (BEW7) into "Primary Knee Replacement" (BEW 7.2) and "Revision Knee Arthroplasty" (BEW 7.2.1), yet some cantons still group all knee procedures under the original BEW7 heading, and 30 additional SPLGs (such as "Spinal Neurosurgery" (NCH2) and "Complex Interventional Radiology" (RAD2)) are omitted entirely. At the same time, reliance on an older version means that outdated level-of-service definitions persist. GR's 2016-based version still mandates a Level 2 designation for "polytrauma surgery" (UNF1) in intensive-care provision, reflecting Zurich's 2016 criteria, even though the 2025 update no longer assigns any required level to that category. This dependence on versions thus leads both to gaps where new SPLGs are absent and to the continuation of removed requirement definitions. Additionally, older versions lead to older service-specific requirements that have been updated in the meantime. Then, tumour board requirements show deviations across 13 cantons from the Zurich 2025 model due to older versions, mostly by providing specific information on the timing of the tumour board.

### *Variation due to a deliberate modification*

Certain cantons decide to deviate from Zurich's requirements. Thurgau (TG) distinguishes between internal and external emergency services, unlike most cantons that follow Zurich's four levels. All intercantonal clinics in TG must cooperate with Spital Thurgau AG. The canton decided against adding clinics for emergency care mainly due to cost reasons.

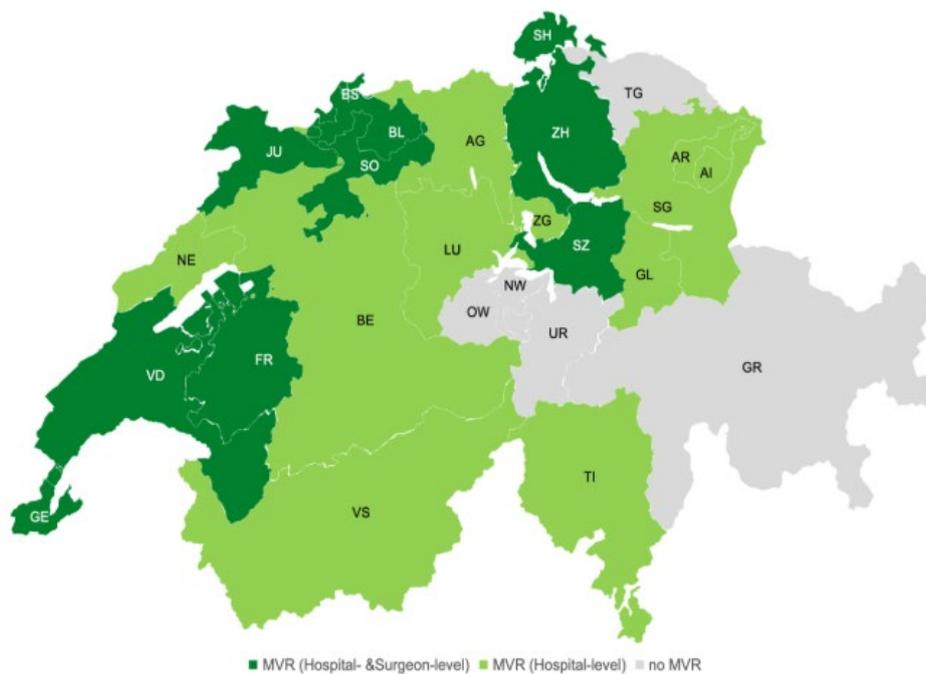
Aargau (AG) and Bern (BE) exhibit the greatest deviations from Zurich's standards. When it comes to medical specialist qualifications, BE and AG only recognize hospital-employed specialists, while other cantons also allow visiting specialists for half of the SPLGs. The two cantons also deviate in certain SPLGs from the specialist qualification, as one interviewee explained: *What we do, however, on a case-by-case basis, is that when we see that several hospitals, meaning at least three or four, are having problems meeting certain requirements, we really discuss it with the physicians and the hospitals to see if there is an alternative solution. Concretely, this means, for example, if Zurich, a city canton, says that acute geriatrics requires a geriatrician, and we then notice that our hospitals do not have that specialist. In such cases, we adjust the*

requirements for that service mandate, as long as the quality is equivalent, and we say: okay, it can be a geriatrician, but it is also acceptable to have, for instance, an internist with this or that specialization.

AG and BE also deviate in the definition of the availability of medical specialists or the cooperation requirement. BE and AG have formalized the “in-house or in cooperation” requirement further, stipulating that it must be supported by a formal cooperation contract (KV) or cooperation concept (KK). BE and AG are the two cantons that deviated in most requirement categories compared to Zurich. BE also defined an accessibility goal, namely that they want basic inpatient somatic and emergency care to be available within 30 minutes in all regions.

The most actively adapted service-specific requirement is the minimum volume requirement. Zurich implemented minimum volume requirements at the hospital level in 2012 and extended these requirements to the surgeon level in 2019 [28]. However, not all cantons have adopted these requirements on hospital and or surgeon level, as outlined in Figure 2.

**Figure 2: Adoption of minimum volume requirements at hospital and surgeon level across cantons.**



Note : Abbreviations of the cantons can be found in the glossary. Dark green cantons have introduced minimum volume requirements at both the hospital and surgeon levels, whereas light green cantons apply minimum volume requirements only at the hospital level. Cantons shown in grey have not yet implemented minimum volume requirements (as of June 2025).

Out of 26 cantons, ten have set MV requirements with specific thresholds for surgeons, eleven have implemented MV at the hospital level, and five do not have any MV standards. In cantons that apply MV, thresholds are defined for 33 SPLGs, with minimal variation. Only three deviations are attributable to older planning documents. For instance, in case of “Reconstruction of the Lower Extremities” (BEW7) and “Spine Surgery” (BEW8), and their subgroups, BE consistently sets lower MV thresholds than Zurich. For obstetrics (GEB1.1), all cantons that apply minimum volume requirements set a threshold of 1,500 procedures, which is defined jointly with primary obstetric care (GEB1). The interviewee from the canton of GR, which has no MV requirements, explained: *In the canton, we are talking about just over 1,000 births per year, which would mean only a single maternity ward if minimum case numbers of 500 to 600 are required. However, even by private car, travel times from a remote valley to Chur can exceed two hours. The question that remains open today is whether two hours is too long or not.*

MV enforcement varies across cantons, and when hospitals fail to meet MV requirements, standards are often eased. A cantonal representative noted: *We have deviated somewhat from the minimum volume requirements in some cases because we realised that we cannot quite meet them for individual services, as we do not have as many cases in the entire region as are required there.* The implementation of MV has been a politically contentious issue, leading to significant debate about their validity. Key points of debate include whether MV are necessary, whether they limit “occasional surgeons,” or whether the focus should be on consolidating specialized services at higher levels of care. As noted by Expert 1, *the leniency is driven by political factors and less by medical necessity*, while a cantonal representative said: *We are relatively critical of these minimums, because the worst thing is actually a concentration in one hospital that does it poorly.*

Furthermore, as interviews showed, further situational exceptions in all service-specific requirements, that are not documented, are possible. As one cantonal representative noted: *The background is that, while we adopt the systematic and therefore also the requirements in principle, we can deviate from a one-to-one application in individual cases if this is indicated for care purposes due to regional circumstances. To my*

*knowledge, most cantons make such individual deviations in hospital capacity planning.* In the interviews, seven cantons mentioned such situational exceptions.

## **Cantonal perspectives**

The following insights into the cantonal perspectives on HCPM emerged directly from the interviews conducted as part of this study. These themes were largely driven by questions included in the interview guide and shed light on the varying opinions and concerns of cantonal representatives and HCPM experts regarding the reform's implementation, the challenges and barriers, and the future of hospital capacity planning.

### *Subjective assessment on quality, economic efficiency, centralisation and consolidation*

All interviewees were asked about their subjective assessment of the reform's impact on quality, economic efficiency, consolidation of hospitals and centralization of service mandates.

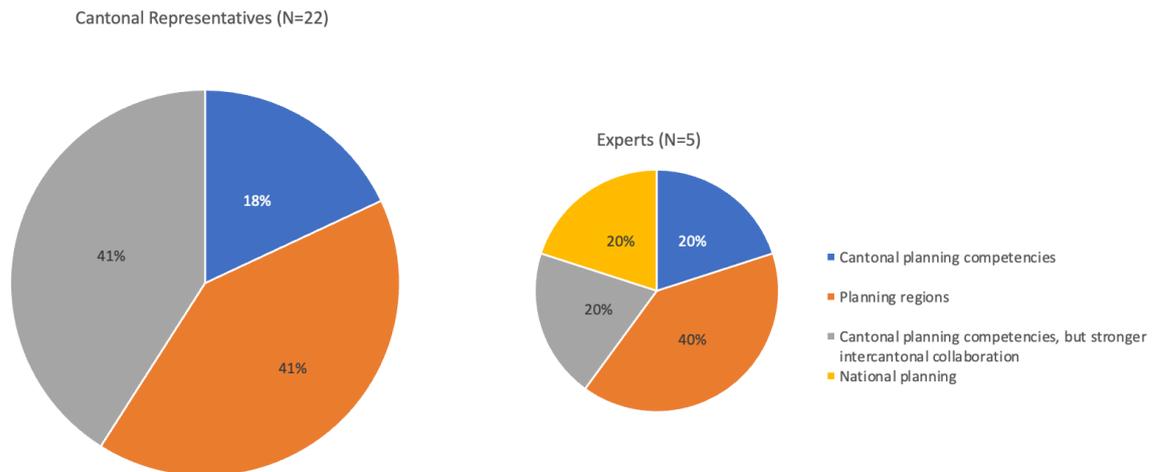
The experts as well as cantonal representatives found it difficult to link certain outcomes directly to the legal changes of hospital capacity planning, given the multifaceted nature of the reform, which included elements such as financing and free hospital choice. A consolidation of hospitals and a centralization of services was observed by cantons (16/22 and 14/22 respectively) as well as experts (4/5 and 2/5 respectively) as a result of MV requirements. Two cantonal representatives mentioned, that the discussion and introduction of minimum volume had an effect on the centralization of services, as certain hospitals independently ceased certain services if case numbers were too low. One rural cantonal representative expressed concerns about further centralization, fearing it might hinder their ability to attract enough physicians and nurses, who often prefer to work in more specialized settings. While some cantons argued that the state should take an active role in driving consolidation and centralisation, others advocated for a more market-driven approach, allowing these processes to unfold naturally. Additionally, one cantonal representative highlighted, that defining maximum travel time criteria could help in making consolidation decisions, as closing hospitals is very sensitive for politicians: *We know that many health directors run the risk of being voted out of office if they close hospitals. This has already happened on several occasions, hasn't it? But this is not a question of regulation, but rather a question of implementing legal*

requirements. Another cantonal representative mentioned: *I think that proximity to one's place of residence is still very important, and that a hospital also has voter potential, as it is often a major employer in the region or for a canton, and that creates a certain amount of political pressure. So, in principle, one could say that it can be difficult for politicians to make the necessary corrections.* 7/22 of cantonal representatives and 4/5 of experts did not perceive an impact on economic efficiency, attributing changes more to adjustments in financing mechanisms rather than the HPCM changes themselves. Another effect that emerged from the interviews was that the SPLG systematic led to professionalization. One expert said: *I think the biggest influence is that the service groups have been defined throughout Switzerland and everyone is talking about the same thing.* While we did not specifically ask about professionalization, it was mentioned as an effect of the reform by 11/22 of the interviewed cantons and by one expert. 18/22 of interviewed cantons and all experts said, that the reform had a positive effect on healthcare quality. However, the improvement in quality was also attributed to the MV requirements and therefore more to the SPLG systematic and less to the national reform.

### *Planning competences*

Most cantonal representatives (18/22) expressed a desire for greater collaboration between cantons, particularly within the framework of planning regions, as shown in Figure 3. However, defining these regions presents a challenge, as patient flows often go beyond cantonal borders, prompting questions about the optimal grouping of cantons. As one cantonal interviewee highlighted: *One major challenge is that the cantons are planning something that does not adhere to cantonal boundaries.* 9 representatives explicitly stated that while they are open to collaborate with other cantons on health services delivery, they prefer to retain the decision-making power within their own canton. In terms of planning competencies, the cantons generally do not seek additional authority from the state. However, they welcome the further development of SPLGs and the respective requirements by a national body. Currently, Zurich drives the development of these guidelines, with cantons adapting them to their specific needs.

**Figure 3: Perspectives on hospital capacity planning competencies in the future**



None of the cantonal interviewees expressed a desire for more federal control over planning. That said, one expert did advocate for greater federal competences, naming the relatively small size of Switzerland and significant market fragmentation as main arguments.

A key element in planning competencies is resource availability for hospital capacity planning, which differs significantly across cantons. Larger cantons usually have dedicated interdisciplinary teams handling hospital capacity, while smaller cantons often lack full-time staff for this purpose and rely on third parties like OBSAN or consulting agencies. Smaller cantons have shown interest in enhanced regional collaboration.

The increased workload resulting from the reform has placed additional pressure on cantonal authorities and hospitals, further exacerbating resource constraints. Additionally, less resources can keep cantons from adopting further quality requirements, as they have no capacities to check the compliance: *Because in that sense, we don't have quality monitoring, like the Canton of Zurich. We only act when complaints arise or, yes, when there is some dissatisfaction.* Finally, political dynamics and varying objectives create significant challenges for inter-cantonal collaboration. One inter-cantonal collaboration did not materialize, as the cantons could not agree on MV requirements.

The dual role of cantons as both regulators and hospital owners often leads to conflicting priorities, which complicates efforts to establish a unified approach to HCPM. These differences hinder effective collaboration across regions, limiting the potential for coordinated planning and shared solutions.

Nevertheless, it is important to mention that two inter-cantonal collaborations between cantons are currently active (between BS/BL and between SG/AR/AI).

### *Further challenges*

All interviewees agreed that politics complicate hospital capacity planning, as cantons juggle multiple roles, acting both as regulators and owners of local hospitals. Cantonal representatives also expressed caution in need-for-care planning, acknowledging their limited influence over outpatient care and investment decisions in inpatient services. They highlighted the management of overprovision in healthcare as a key future challenge for cantonal authorities.

While all cantons acknowledged and appreciated Zurich's efforts in developing the SPLG model, they noted significant differences between Zurich and their own regions, particularly in terms of population, topography, patient flows, and hospital landscapes. One key challenge identified was the regional divide between French- and German-speaking cantons, often referred to as the "Röschti Graben". For example, one French-speaking canton noted that although they use Zurich's planning documents, they avoid publicly acknowledging this due to concerns about public reluctance or resistance.

## **Discussion**

The primary aim of this study was to examine how the Swiss HCPM reform has been implemented at the cantonal level and to explore the factors driving variation in these approaches. While cantons were formally free to implement the reform, in practice, planning tools and methods have largely converged over time, following the SPLG-model developed by the canton of Zurich. French-speaking cantons were initially more reluctant to adopt the Zurich model, reflecting historical differences in health approaches along linguistic boundaries [29]. Today, most cantons use similar approaches to determine need-for-care and organize service groups, suggesting that strong regional models can guide convergence even in decentralized systems. This convergence was later reflected in the 2022 ordinance, which formally manifested some of the Zurich-based practices and requirements, although most additions remain non-binding, allowing cantons to retain flexibility in implementation. Differences persist in requirements, particularly MVR, where political and regional interests continue to influence decisions.

As SPLGs become more specialized and complex, centralization is increasingly necessary, as only a few hospitals nationwide meet the criteria for specialized care [8]. The introduction of MVR in the SPLG system, initiated in 2012 for hospitals and in 2019 for surgeons, has been contentious. Enforcement is inconsistent, with some cantons relaxing standards due to political pressures. Cantonal debates remain over whether MVR improve quality and efficiency or primarily restrict access for smaller or specialized hospitals. Our findings suggest that MVR are among the most politically sensitive aspects of HCPM, with cantonal opinions varying. While international literature shows a positive link between volume and quality [7, 20, 28], differing requirements across cantons challenge the notion of a uniform quality standard [30–32]. Despite these variations, significant progress has been made in standardizing core aspects of hospital capacity planning, such as service group definitions and the inclusion of medical specialist availability and cooperation requirements.

Cantonal representatives expressed interest in further standardization of hospital capacity planning requirements, which could reduce the political nature of decisions regarding centralization and hospital consolidation. Harmonized tools, clearer criteria and intercantonal planning could also decrease administrative burdens, particularly for smaller cantons. Standardized requirements would support MV enforcement and enhance quality.

The Swiss experience aligns with international findings from decentralized systems. Italy's hospital capacity planning is also decentralized, but national standards set bed numbers, hospital classification, and procedure volumes (Ministerial Decree 70/2015). Regions must follow these standards while adapting to local conditions. Even with clear central targets, local adaptation is necessary to maintain access and address regional constraints. [33]. In Switzerland, while national guidance was limited, the Zurich SPLG model effectively served as a reference, leading to de facto harmonization of planning tools across cantons.

Interestingly, a similar approach has recently been adopted in Germany with the 2024 hospital reform. Although still too early to evaluate its outcomes, the reform also employs SPLGs and establishes national quality requirements for hospitals. Responsibility for hospital capacity planning, however,

remains with the Länder, reflecting a federal model similar to Switzerland. This parallel highlights an emerging trend in federal health systems, which combines national guidance on quality and service definitions with regional autonomy in planning, allowing for both standardization and adaptation to local needs. Experiences from other countries in centralized health systems, such as Denmark, show that public acceptance of centralized, high-quality care is facilitated by shared understanding and clear communication, particularly when proximity may be sacrificed for quality [10]. More equal requirements can facilitate cross-region collaboration and ease burden on smaller cantons with fewer resources. Research shows resources influence policy success. [7, 34].

The study's results are internationally significant, as many countries follow or develop similar decentralized HCPM models. The observed differences in implementation, particularly regarding the standardization of requirements and collaboration between regional authorities, provide valuable insights for other countries striving to optimize their HCPM and ensure sustainable healthcare provision.

Based on our findings, we would like to propose the following policy recommendations:

1. **Develop a national framework for standardized hospital capacity planning:** In decentralized health systems, strong regional models can guide convergence, but formal frameworks at the national or federal level help ensure consistent quality and coordination. Such frameworks should define core standards, like service groups, minimum volumes, or quality criteria. Establishing a coordinating body to develop, monitor, and update these standards can promote adoption, reduce political pressure, and facilitate collaboration across regions.
2. **Allow for evidence-based regional flexibility:** While national guidance provides consistency, local adaptation is essential to account for regional needs, patient flows, and socio-political contexts. Any deviations from the standardized framework should be explicitly justified and transparently documented to maintain accountability, safeguard access, and ensure high-quality care. This balance between standardization and flexibility supports both equitable service provision and responsiveness to local realities.

### *Limitations*

Although 20 cantons participated in interviews, the study did not include all 26 cantons, as six cantons declined to provide in-person interviews. While some of these cantons provided written data or brief telephone responses, the lack of direct interviews may limit the breadth of insights from these regions. This could result in a sampling bias, where the views of cantonal representatives who were more engaged or had more resources are overrepresented. Furthermore, the qualitative nature of this study means the findings may not be generalizable to other countries with different health systems. While the findings provide insights into the Swiss context, the specific challenges faced by cantons and their approaches to hospital capacity planning may not be directly applicable to decentralized health systems elsewhere.

### **Conclusion**

In Switzerland's hospital capacity planning landscape, the most notable differences remain in the enforcement of minimum volume requirements, where political pressures and regional interests have limited full standardization and inter-cantonal collaboration. Nevertheless, significant progress has been achieved in harmonizing planning tools and practices, particularly through the adoption of service groups and standardized methods for determining need-for-care.

The Swiss experience shows that decentralization can lead to convergence in planning. Zurich's SPLG model influenced other cantons, aligning hospital capacity planning. Similarly, in Italy, national standards support equitable, quality care, but success depends on regional political, geographical, and socioeconomic factors.

Future research should evaluate the impact of HCPM reforms on health outcomes and efficiency, and further explore strategies to balance national standardization with evidence-based regional flexibility. Internationally, these findings provide valuable insights for decentralized health systems seeking to harmonize hospital capacity planning while respecting local needs and political realities.

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## Glossary

CHOP	Schweizerische Operationsklassifikation (English: Swiss surgical classification)
DRG	Diagnosis Related Groups
GDK	Konferenz der kantonalen Gesundheitsdirektorinnen und -direktoren (English: Conference of Cantonal Health Directors)
HCPM	Hospital capacity planning model
FMH	Swiss Medical Association
ICD	International Statistical Classification of Diseases and Related Health Problems
IVHSM	Interkantonalen Vereinbarung über die hochspezialisierte Medizin (English: Inter-Cantonal Agreement on Highly Specialized Medicine)
KK	Kooperationskonzept (English: cooperation concept)
KV	Kooperationsvertrag (English: cooperation contract)
KVG	Bundesgesetz über die Krankenversicherung (English: Federal law on health insurance)
KVV	Verordnung über die Krankenversicherung (English: Ordinance on health insurance)
MV	Minimum volume
OBSAN	Schweizerische Gesundheitobservatorium (English: Swiss Health Observatory)
SGI	Schweizerische Gesellschaft für Intensivmedizin (English: Swiss Organisation for Intensive Care)
SPLB	Spitalplanungs-Leistungsbereiche (English: Hospital Planning Service Areas)
SPLG	Spitalplanungs-Leistungsgruppen (English: Hospital Planning Service Groups)

## Glossary of Swiss

### Cantons

AG	Aargau	GL	Glarus	SO	Solothurn
AI	Appenzell Inner-Rhodes	GR	Grisons	SZ	Schwyz
AR	Appenzell Outer-Rhodes	JU	Jura	TG	Thurgau
BE	Bern	LU	Lucerne	TI	Ticino
BL	Basel-County	NE	Neuchâtel	UR	Uri
BS	Basel-City	NW	Nidwalden	VD	Vaud
FR	Fribourg	OW	Obwalden	VS	Valais
GE	Geneva	SG	St. Gallen	ZG	Zug
		SH	Schaffhausen	ZH	Zurich

## Appendix

### *Appendix 1. Overview of different requirements from Zurich's 2025 definition (an English translation)*

#### *Level of availability of medical specialists*

Zurich outlines four levels of availability, ranging from reachability within one hour (Level 1) to on-site presence within 15 minutes for obstetrics (Level 4) [22].

Table 2. Definition of levels of availability of medical specialists according to Zurich HCP documents.

ICU Levels	Description
Level 1	The medical specialist must be reachable within 1 hour, or the patient must be transferred within 1 hour.
Level 2	The medical specialist must be available at all times. A diagnostic or therapeutic intervention must be possible within 1 hour; exceptionally, this may be ensured by other means.
Level 3	The medical specialist must be available at all times. A diagnostic or therapeutic intervention must be possible within 30 minutes.
Level 4 (Obstetrics)	The medical specialist must be on-site within 15 minutes of childbirth.

#### *Emergency care*

The Zurich model distinguishes four levels of emergency care, ranging from basic daytime availability of internal medicine and surgical staff (Level 1) to 24/7 on-site presence of obstetric specialists within 10 minutes (Level 4) [22].

Table 3. Definition of levels of emergency care requirements according to Zurich HCP documents.

Emergency level	Description of level
1	Monday–Friday, 8 am to 5 pm: Physicians with certification in General Internal Medicine and Surgery must be available for the emergency department (multi-functional hospital staff deployment).  Monday–Friday, 5 pm to 8 am, and 24/7 on weekends and public holidays: Residents in General Internal Medicine and Surgery must be available for the emergency department. If medically necessary, a board-certified physician in General Internal

	Medicine and a board-certified physician in Anaesthesiology or Surgery must be available on-site within 15 minutes.
2	Monday–Friday, 8 am to 5 pm: Physicians with board certification in General Internal Medicine and Surgery must be available as the first priority for the emergency department. They are not permitted to be concurrently assigned to operating theatres. Monday–Friday, 5 pm to 8 am, and 24/7 on weekends and public holidays: Same requirements as for Level 1.
3	Monday–Friday, 8 am to 11 pm: Same requirements as Level 2. Monday–Friday, 11 pm to 8 am, and 24/7 on weekends and public holidays: Residents in General Internal Medicine and Surgery must be available as first priority. If medically necessary, they must be at the emergency department within 5 minutes. One of these physicians must be a resident in the second half of their specialist training. Additionally, at least one physician with board certification in Surgery must be available on-site within 15 minutes (they may also be involved in surgery only for emergency cases), and a physician with board certification in General Internal Medicine must be available on-site within 30 minutes. If medically required, a board-certified physician in Anaesthesiology (in-house) or Intensive Care Medicine must be available. For paediatric hospitals, a board-certified paediatrician must be available on-site from Monday to Sunday, 11 pm to 8 am, within 45 minutes.
4 (Obstetrics)	Monday–Sunday, 24 hours/day: A physician with board certification in Gynaecology and Obstetrics must be available on-site for the delivery unit within 10 minutes. The emergency delivery case must be managed within 15 minutes; this is defined as the time between the decision for Caesarean section and the birth. If medically necessary, a board-certified anaesthesiologist (in-house) or a midwife (on-site) must be present.

*Intensive Care Unit (ICU) (Zurich’s 2025 definition)*

The Zurich model defines three levels of ICU, from observation units (Level 1) to certified training institutions (Level 3), based on criteria set by the Swiss Society of Intensive Care Medicine (SGI) 4.

Table 4. Definition of intensive care unit (ICU) levels according to the Zurich HCP documents.

ICU Levels	Description
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1 - Intermediate Care Unit	Further requirements can be found in the annex "Additional Service-Specific Requirements" of the hospital list.
Level 2 – ICU certified by the SGI	The certification guidelines of intensive care units as defined by the Swiss Society of Intensive Care Medicine (SGI), including the quality criteria in Annex I, must be fulfilled.
Level 3 – ICU certified as SGI Training Centre	The guidelines for recognition as a training centre by the SGI, including the quality criteria in Annex I, must be met. Additionally, the following FMH (Swiss Medical Association) criteria for a Category A training centre must be fulfilled: At least 3,000 patient care days per year and at least 24,000 ventilation hours according to DRG per year.



Note: The table shows the presence of three types of documents across Swiss canton from 2012 to 2024: A (General requirements), B (Hospital lists), and C (Requirements for SPLGs). A green cell indicates that a document was publicly available on the cantonal website in the respective year, while a red cell indicates no publication.

Table 6. Sources of current hospital lists and SPLG requirements.

Canton	Hospital List	Requirements of SPLGs
AG	<a href="https://www.ag.ch/media/kanton-aargau/dgs/dokumente/gesundheit/gesundheitsversorgung/spitaeler-kliniken/241218-spitalliste-2025-akutsomatik-rrb-nr-2024-001610.pdf">https://www.ag.ch/media/kanton-aargau/dgs/dokumente/gesundheit/gesundheitsversorgung/spitaeler-kliniken/241218-spitalliste-2025-akutsomatik-rrb-nr-2024-001610.pdf</a>	<a href="https://www.ag.ch/media/kanton-aargau/dgs/dokumente/gesundheit/gesundheitsversorgung/spitaeler-kliniken/d-anhang-5-zur-rrb-nr-2024-001212-2.pdf">https://www.ag.ch/media/kanton-aargau/dgs/dokumente/gesundheit/gesundheitsversorgung/spitaeler-kliniken/d-anhang-5-zur-rrb-nr-2024-001212-2.pdf</a>
AI	<a href="https://www.ai.ch/themen/gesundheit-alter-und-soziales/gesundheitsversorgung/spitallisten-und-spitalfinanzierung/akutsomatik/dokumente-spitalplanung-akutsomatik-araisg-per-1-januar-2025/spitalliste-akutsomatik-araisg-2024-2-per-januar-2025.pdf/download">https://www.ai.ch/themen/gesundheit-alter-und-soziales/gesundheitsversorgung/spitallisten-und-spitalfinanzierung/akutsomatik/dokumente-spitalplanung-akutsomatik-araisg-per-1-januar-2025/spitalliste-akutsomatik-araisg-2024-2-per-januar-2025.pdf/download</a>	<a href="https://www.ai.ch/themen/gesundheit-alter-und-soziales/gesundheitsversorgung/spitallisten-und-spitalfinanzierung/akutsomatik/dokumente-spitalplanung-akutsomatik-araisg-per-1-januar-2025/leistungsspezifische-anforderungen-an-die-listenspitaeler-araisg-2024.pdf/download">https://www.ai.ch/themen/gesundheit-alter-und-soziales/gesundheitsversorgung/spitallisten-und-spitalfinanzierung/akutsomatik/dokumente-spitalplanung-akutsomatik-araisg-per-1-januar-2025/leistungsspezifische-anforderungen-an-die-listenspitaeler-araisg-2024.pdf/download</a>
AR	<a href="https://ar.ch/fileadmin/user_upload/Departement_Gesundheit_Soziales/Amt_fuer_Gesundheit/03_Spitalversorgung/01_Spitalplanung/Spitalliste/Spitalliste_Akutsomatik_ARAISG_2024.2.pdf">https://ar.ch/fileadmin/user_upload/Departement_Gesundheit_Soziales/Amt_fuer_Gesundheit/03_Spitalversorgung/01_Spitalplanung/Spitalliste/Spitalliste_Akutsomatik_ARAISG_2024.2.pdf</a>	<a href="https://ar.ch/fileadmin/user_upload/Departement_Gesundheit_Soziales/Amt_fuer_Gesundheit/03_Spitalversorgung/01_Spitalplanung/Spitalliste/Spitalliste_Akutsomatik_ARAISG_2024.2.pdf">https://ar.ch/fileadmin/user_upload/Departement_Gesundheit_Soziales/Amt_fuer_Gesundheit/03_Spitalversorgung/01_Spitalplanung/Spitalliste/Spitalliste_Akutsomatik_ARAISG_2024.2.pdf</a>
BL	<a href="https://bl-api.webcloud7.ch/politik-und-behorden/direktionen/volkswirtschafts-und-gesundheitsdirektion/amt-fur-gesundheit/spitaeler-und-therapieeinrichtungen/spitallisten/dateien-spitallisten/spitalliste-akutsomatik.pdf">https://bl-api.webcloud7.ch/politik-und-behorden/direktionen/volkswirtschafts-und-gesundheitsdirektion/amt-fur-gesundheit/spitaeler-und-therapieeinrichtungen/spitallisten/dateien-spitallisten/spitalliste-akutsomatik.pdf</a>	Not publicly available. BL uses ZH2023 (Information obtained from the cantonal representative via email).
BS	<a href="https://media.bs.ch/original_file/42bc8aaef34e2d5ff5282b4cee18b84f35781781/spitalliste-akutsomatik-25-01.pdf">https://media.bs.ch/original_file/42bc8aaef34e2d5ff5282b4cee18b84f35781781/spitalliste-akutsomatik-25-01.pdf</a>	Not publicly available. BS uses ZH2023 (Information obtained from the cantonal representative via email).
BE	<a href="https://www.gsi.be.ch/content/dam/gsi/dokumente-bilder/de/themen/gesundheit/gesundheitsversorger/spitaeler-psychiatrie-rehabilitation/spitalliste/sl-akutsomatik-2019-laufende-aenderungen-01-07-2025.pdf">https://www.gsi.be.ch/content/dam/gsi/dokumente-bilder/de/themen/gesundheit/gesundheitsversorger/spitaeler-psychiatrie-rehabilitation/spitalliste/sl-akutsomatik-2019-laufende-aenderungen-01-07-2025.pdf</a>	<a href="https://www.gsi.be.ch/content/dam/gsi/dokumente-bilder/de/themen/gesundheit/gesundheitsversorger/spitaeler-psychiatrie-rehabilitation/spitalliste/splg-systematik-akutsomatik-be-version-2025.pdf">https://www.gsi.be.ch/content/dam/gsi/dokumente-bilder/de/themen/gesundheit/gesundheitsversorger/spitaeler-psychiatrie-rehabilitation/spitalliste/splg-systematik-akutsomatik-be-version-2025.pdf</a>
FR	<a href="https://bdlf.fr.ch/frontend/annex_document_dictionaries/5302">https://bdlf.fr.ch/frontend/annex_document_dictionaries/5302</a>	Uses ZH2025 for new planning cycle.
GE	<a href="https://www.ge.ch/document/27217/telechargergenf">https://www.ge.ch/document/27217/telechargergenf</a>	Not publicly available. GE uses ZH2025 (Information obtained from the cantonal representative via email).
GL	<a href="#">Glarner Spitalliste 2012 Akutsomatik V2015.2.pdf</a>	<a href="https://www.gl.ch/public/upload/assets/4413/Anhang_Spitalliste_-_Leistungsspezifische_Anforderungen.pdf?fp=1">https://www.gl.ch/public/upload/assets/4413/Anhang_Spitalliste_-_Leistungsspezifische_Anforderungen.pdf?fp=1</a>

GR	<a href="https://www.gr.ch/DE/institutionen/verwaltung/djsg/ga/InstitutionenGesundeitswesens/Spitaeler/Dok%20Spitler/Spitalliste_Akutsomatik.pdf">https://www.gr.ch/DE/institutionen/verwaltung/djsg/ga/InstitutionenGesundeitswesens/Spitaeler/Dok%20Spitler/Spitalliste_Akutsomatik.pdf</a>	Not publicly available. GR uses ZH2016 (Information obtained from the cantonal representative via email).
JU	<a href="https://www.jura.ch/Htdocs/Files/v/c680f757270a90ffdb65bbd8c8236a81823a183880bd7286a0795e103b3a0066.pdf/Liste-hospitaliere-2023.pdf?download=1">https://www.jura.ch/Htdocs/Files/v/c680f757270a90ffdb65bbd8c8236a81823a183880bd7286a0795e103b3a0066.pdf/Liste-hospitaliere-2023.pdf?download=1</a>	Not publicly available. JU uses ZH2025 (Information obtained from the cantonal representative via email).
LU	<a href="https://gesundheit.lu.ch/-/media/Gesundheit/Dokumente/Gesundheitsversorgung/Spitalliste/Spitalliste_vom_22032016_mit_nderungen_23012024_inklSt.pdf?rev=0954de434e304a59b76e4034e82a3519">https://gesundheit.lu.ch/-/media/Gesundheit/Dokumente/Gesundheitsversorgung/Spitalliste/Spitalliste_vom_22032016_mit_nderungen_23012024_inklSt.pdf?rev=0954de434e304a59b76e4034e82a3519</a>	Not publicly available. LU uses ZH2019 (Information obtained from the cantonal representative via email).
NE	<a href="https://www.ne.ch/autorites/DFS/SCSP/Documents/ListeHospitaliereNE_2016-22_01092023.pdf">https://www.ne.ch/autorites/DFS/SCSP/Documents/ListeHospitaliereNE_2016-22_01092023.pdf</a>	<a href="https://www.ne.ch/autorites/DFS/SCSP/hopitaux-institutions/Documents/PlanifHospitalRapportCondCadres.pdf">https://www.ne.ch/autorites/DFS/SCSP/hopitaux-institutions/Documents/PlanifHospitalRapportCondCadres.pdf</a>
NW	<a href="https://www.nw.ch/docn/418336/Spitalliste_2017-12.pdf">https://www.nw.ch/docn/418336/Spitalliste_2017-12.pdf</a>	Not existent.
OW	<a href="https://gdb.ow.ch/app/de/texts_of_law/830.511/versions/1428">https://gdb.ow.ch/app/de/texts_of_law/830.511/versions/1428</a>	Not existent.
SG	<a href="https://www.sg.ch/gesundheit-soziales/gesundheit/gesundheitsversorgung--spitaeler/spitalplanung-spitalliste/jcr_content/Par/sgch_accordion_list/AccordionListPar/sgch_accordion_458606438/AccordionPar/sgch_downloadlist/DownloadListPar/sgch_download.ocFile/Spitalliste_Akutsomatik_SG_2024_I_Nachtrag.xlsx">https://www.sg.ch/gesundheit-soziales/gesundheit/gesundheitsversorgung--spitaeler/spitalplanung-spitalliste/jcr_content/Par/sgch_accordion_list/AccordionListPar/sgch_accordion_458606438/AccordionPar/sgch_downloadlist/DownloadListPar/sgch_download.ocFile/Spitalliste_Akutsomatik_SG_2024_I_Nachtrag.xlsx</a>	<a href="https://www.sg.ch/gesundheit-soziales/gesundheit/gesundheitsversorgung--spitaeler/spitalplanung-spitalliste/jcr_content/Par/sgch_accordion_list/AccordionListPar/sgch_accordion_458606438/AccordionPar/sgch_downloadlist/DownloadListPar/sgch_download_871643544.ocFile/SPLG_2025.ARAISG01.xlsx">https://www.sg.ch/gesundheit-soziales/gesundheit/gesundheitsversorgung--spitaeler/spitalplanung-spitalliste/jcr_content/Par/sgch_accordion_list/AccordionListPar/sgch_accordion_458606438/AccordionPar/sgch_downloadlist/DownloadListPar/sgch_download_871643544.ocFile/SPLG_2025.ARAISG01.xlsx</a>
SH	<a href="https://sh.ch/CMS/get/file/b6df40ca-fe4d-4dd0-abbf-7357926ac331">https://sh.ch/CMS/get/file/b6df40ca-fe4d-4dd0-abbf-7357926ac331</a>	Not publicly available. SH uses ZH2025 (Information obtained from the cantonal representative via email).
SO	<a href="https://so.ch/fileadmin/internet/ddi/ddi-gesa/PDF/Behandlung_und_Pflege/Spitalliste_Akut_2024_07_01.pdf">https://so.ch/fileadmin/internet/ddi/ddi-gesa/PDF/Behandlung_und_Pflege/Spitalliste_Akut_2024_07_01.pdf</a>	Not publicly available. SO uses ZH2023 (Information obtained from the cantonal representative via email).
SZ	<a href="https://www.sz.ch/public/upload/assets/67681/Schwyzer_Spitalliste_2025_Akutsomatik_Stand_1-Juli-2025.pdf?fp=8">https://www.sz.ch/public/upload/assets/67681/Schwyzer_Spitalliste_2025_Akutsomatik_Stand_1-Juli-2025.pdf?fp=8</a>	Not publicly available. SZ uses ZH2025 (Information obtained from the cantonal representative via email).
TG	<a href="https://gesundheit.tg.ch/public/upload/assets/138352/Thurgauer_Spitalliste_Akutsomatik_Version_2023.1.pdf?fp=2">https://gesundheit.tg.ch/public/upload/assets/138352/Thurgauer_Spitalliste_Akutsomatik_Version_2023.1.pdf?fp=2</a>	Not publicly available. TG uses ZH2023 (Information obtained from the cantonal representative via email).
TI	<a href="https://www4.ti.ch/fileadmin/DSS/DSP/AGS/Elenco_ospedaliero_stato_al_22.12.2021.pdf">https://www4.ti.ch/fileadmin/DSS/DSP/AGS/Elenco_ospedaliero_stato_al_22.12.2021.pdf</a>	Not publicly available. TI uses ZH2012 (Information obtained from the cantonal representative via email).
UR	<a href="https://rechtsbuch.ur.ch/lexoverview-home/lex-20_3235?effective-from=20230101">https://rechtsbuch.ur.ch/lexoverview-home/lex-20_3235?effective-from=20230101</a>	Not existent.

VD	<a href="https://www.vd.ch/fileadmin/user_upload/themes/sante/Organisation/Hospitaux/Arr%C3%AAt%C3%A9_fixant_la_liste_des_h%C3%B4pitaux_de_soins_somatiques_aigus_Version_01.01.2024.pdf">https://www.vd.ch/fileadmin/user_upload/themes/sante/Organisation/Hospitaux/Arr%C3%AAt%C3%A9_fixant_la_liste_des_h%C3%B4pitaux_de_soins_somatiques_aigus_Version_01.01.2024.pdf</a>	Not publicly available. VD uses ZH2025 (Information obtained from the cantonal representative via email).
VS	<a href="https://www.vs.ch/documents/8841577/8881990/Soins+aigus+liste+hosp+2023+de.pdf/0900be34-d139-21c8-f0d3-322902c071eb?t=1679471266621&amp;v=1.0">https://www.vs.ch/documents/8841577/8881990/Soins+aigus+liste+hosp+2023+de.pdf/0900be34-d139-21c8-f0d3-322902c071eb?t=1679471266621&amp;v=1.0</a>	Not publicly available. VS uses ZH2012 (Information obtained from the cantonal representative via email).
ZG	<a href="https://zg.ch/dam/jcr:9e91dad5-cd35-4102-a594-ce9e94a6d4d1/Spitalliste%202023%20Akutsomatik%20(Version%201.%20Juli%202025).pdf">https://zg.ch/dam/jcr:9e91dad5-cd35-4102-a594-ce9e94a6d4d1/Spitalliste%202023%20Akutsomatik%20(Version%201.%20Juli%202025).pdf</a>	Not publicly available. ZG uses ZH2020 (Information obtained from the cantonal representative via email).
ZH	<a href="https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/gesundheit/gesundheitsversorgung/spitaeler_kliniken/spitalplanung/2024/aktualisierung-spitalliste-november-24/Z%C3%BCrcher%20Spitalliste%202023%20Akutsomatik%202025.1.pdf">https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/gesundheit/gesundheitsversorgung/spitaeler_kliniken/spitalplanung/2024/aktualisierung-spitalliste-november-24/Z%C3%BCrcher%20Spitalliste%202023%20Akutsomatik%202025.1.pdf</a>	<a href="https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/gesundheit/gesundheitsversorgung/spitaeler_kliniken/spitalplanung/2024/aktualisierung-spitalliste-november-24/Z%C3%BCrcher%20Spitalliste%202023%20Leistungsspezifische%20Anforderungen%20Akutsomatik%202025.1.xlsx">https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/gesundheit/gesundheitsversorgung/spitaeler_kliniken/spitalplanung/2024/aktualisierung-spitalliste-november-24/Z%C3%BCrcher%20Spitalliste%202023%20Leistungsspezifische%20Anforderungen%20Akutsomatik%202025.1.xlsx</a>

Note: The table provides the official links to the most recent hospital lists and SPLG requirement documents for each canton, which formed the basis for the analyses.

### Appendix 3. Overview of cantonal characteristics

Table 7. Overview of cantonal characteristics. This table presents descriptive information for each canton, including size, population density, inpatient cases per capita, the year of the most recent hospital list, planning intervals, number of hospitals, and number of mandates.

Canton	Population (based on 31.12.2023) [35]	Size of the canton (km <sup>2</sup> ) [36]	Population density	Hospitalization rate by canton, 2023 (Standardized rate per 100,000 inhabitants) [37]	Current version hospital list in use	Planning interval, years	Hospitals in the list, N	Mandates in canton, N
ZH	1'605'508	1'729	929	16'499	2025	10	25	977
AG	726'894	1'404	518	16'318	2025	4	11	576
AI	16'585	172	96	2'400	2025	10	16	0
AR	56'495	243	233	31'751	2025	10	3	109
BL	298'837	518	577	11'965	2025	4	24	175
BS	200'031	37	5'406	44'349	2025	4	24	317
BE	1'063'533	5'959	178	19'754	2025	10	27	905
FR	341'537	1'671	204	10'341	2015	10	5	205
GE	524'410	282	1'858	17'218	2025	NA	9	261
GL	42'056	685	61	11'815	2015	NA	1	81
GR	204'888	7'105	29	21'082	2022	10	15	444
JU	74'548	839	89	16'697	2023	8 - 10	3	51
LU	432'744	1'493	290	15'204	2024	6	9	459
NE	178'291	802	222	13'476	2016	7	3	97
NW	45'016	276	163	12'698	2017	10 - 15	2	78
OW	39'272	491	80	9'584	2020	NA	1	58
SH	87'111	298	292	14'403	2025	10	2	84
SZ	167'403	908	184	11'028	2025	10	4	159
SO	286'844	790	363	12'511	2023	10	3	116

SG	535'114	2'031	264	17'046	2025	10	16	586
TG	295'220	992	298	16'212	2023	10	4	160
TI	357'720	2'812	127	18'725	2023	10	13	345
UR	37'931	1'076	35	10'933	2015	10	1	25
VS	365'844	5'225	70	12'866	2023	10	8	265
VD	845'870	3'212	263	15'513	2025	10	28	528
ZG	132'556	239	555	15'498	2023	10	2	88

#### *Appendix 4. Interview Guide Cantons*

The following interview guide was shared beforehand with all participants in German or French, depending on the region. It has been translated to English for this manuscript.

##### a) Preparation and introduction

- Welcome: Express gratitude for participation.
- Explanation of context: SNF project The Swiss hospital capacity planning: An empirical evaluation of its impact on hospital service delivery, quality and costs.
- Objective: Discussions with the health departments of various cantons about their perceptions and implementation.
- Duration: 35-45 minutes.
- Emphasise voluntary participation: You are not obliged to answer a question if you do not want to or cannot.
- Confidentiality: The interview will be recorded for transcription and analysis. Your information will be kept confidential. Your answers will be anonymised and will not be published under your name. No one except you and us will know what was said during the interview.
- Declaration of consent: Verbal declaration and presentation of a written document for signature (sent in advance).
- Questions: Opportunity to ask questions.

##### b) Interview questions - Start

1. Can you tell me about hospital planning in Canton X?
2. How did you perceive the implementation of the reform (KVG revision, which came into force in 2009) of hospital planning in Switzerland?
3. In your opinion, what are the biggest challenges facing hospital planning in Switzerland?
4. Hospital landscape in Canton X: How many public and private hospitals are there in Canton X? How many hospitals are on the list, and how many are contractually bound? What distinguishes the hospital landscape in X from other cantons?

##### c) Timetable for implementing the reform

1. When was the reform officially introduced in Canton X (year/month)?
2. What did hospital planning look like before the reform was introduced?
3. Have there been any adjustments since the reform?
4. What factors influenced the speed of reform implementation in Canton X?

##### d) Hospital planning in Canton X

1. How did Canton X implement the revision of the KVG and the reform in its hospital planning?
2. What is the legal basis for hospital planning in Canton X?
3. Did Canton X base its implementation on the 'Zurich model' and structure its hospital planning in a similar way?
4. Are there any differences between the Zurich model and the version implemented in Canton X? If so, what are they?
  - Financing
  - SPLG, requirements
  - Quality
5. How regulated is Canton X compared to other cantons in terms of hospital planning on a scale of 1 to 5 (little to highly regulated)?
6. How are needs analyses calculated and carried out? Have local conditions (e.g. demographic factors such as population size and age or topographical criteria such as rural vs. urban areas) influenced the implementation of the reform?
7. How do patient flows work in Canton X?
8. How does Canton X position itself in relation to intercantonal hospital planning?
9. In your opinion, why did the OST model not come about as planned?

e) Assessment

1. Has the revision of the KVG (hospital planning) had an impact on the following aspects:
  - the profitability of hospitals?
  - the quality of hospitals?
  - the consolidation of hospitals?

f) centralisation of service mandates

1. Do you think that the reform of hospital planning has led to a centralisation of service mandates in Canton X? If so, in what way?
2. Are there any regions, hospitals or service groups that immediately come to mind when you think of centralisation?

g) Future prospects

1. What adjustments would you recommend improving the current hospital planning model in Canton X / Switzerland?

### *Appendix 5. Interview Guide Experts*

While the preparation and introduction to the interview remained the same, the questions were slightly adjusted to achieve a more national perspective.

#### a) General Introduction

1. Can you tell me something about hospital planning in Switzerland in general?
2. What do you think are the biggest challenges of hospital planning in Switzerland?
3. How is the Swiss population changing demographically, and what impact does this development have on future hospital planning?

#### b) Comparison with the Zurich Model

1. Do you think other cantons have adopted the Zurich model as is, or were there delays or resistance? If so, where and to what extent?
2. Are there significant differences between the so-called Zurich model of SPLG and the models in other cantons (especially German-speaking, French-speaking, and Italian-speaking)? If so, what are they?
3. In your report on the future of the healthcare landscape in Switzerland, you describe the hub-and-spoke model, which could reduce healthcare costs (730 million in efficiency gains). How does this fit into the hospital planning reform?
4. Do you think the current reform is sustainable for the future? How do you generally assess the future of the healthcare landscape, focusing on national, cantonal, or regional-cooperative planning?
5. What is your opinion on inter-cantonal hospital planning? Are there any existing or planned projects? If so, in which cantons?

#### c) Evaluation

1. Has the change in hospital planning had an impact on:
  - a) The economic efficiency of hospitals?
  - b) The quality of hospitals?
  - c) The consolidation of hospitals?

#### d) Future Perspectives

1. What adjustments would you recommend improving the current model of hospital capacity planning?