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On the Strategies and Efficiency of Care and Support Systems for Elderly Across Cantons in Switzerland

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Abstract: The Swiss Federal Council has formulated a policy requiring each canton to establish housing conducive to independent living during old age. Maintaining the independence of older adults at home rather than transitioning to more expensive institutional care has gained traction. This study investigates the heterogeneity of strategies arising from the autonomy granted to each canton. Using mandatory statistics from the Swiss Federal Statistical Office for 2020 on 1550 institutions for the elderly and 2546 at-home care providers, we rank the 26 cantons by permanent and temporary care and support, distinguishing between at-home and institutional care. We use univariate regressions to explain differences and perform efficiency analyses of the respective systems. We find that the French- and Italian-speaking cantons prioritise at-home care, while the German-speaking regions rely more on institutional care. The analyses reveal an inefficient stationary approach in German-speaking cantons, which often places elderly individuals with minimal care needs in institutions. Conversely, with an ambulatory approach favouring independence, cantons like Vaud and Valais prioritize counselling and at-home services, deferring entry into institutions and allowing for short convalescence stays. Our findings are relevant for governmental infrastructure planning and the property owners, investors, and property managers involved in senior housing decisions.

Keywords: assisted living in Switzerland; ageing in place; long-term care; efficiency; institutions for the elderly

JEL Classification: I11; I18

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1. Introduction

Care and support for older adults are crucial policy concerns for governments today. By 2050, the population aged over 64 is expected to increase by 25% in Europe (World Health Organization 2023). The European Commission, in their report on long-term care (LTC) needs, stresses the importance of improving efficiency in the provision of LTC to address the projected increase in demand (Belmonte et al. 2023). Ageing in place has gained substantial attention in research and policy due to its emphasis on promoting independent living within the community rather than institutional care (Belmonte et al. 2023; Seo and Lee 2023). Older adults who opt for ageing in place maintain their autonomy, independence, and social support connections (Carswell 2017; Ratnayake et al. 2022). On the economic front, staying at home is more cost-effective than options like institutional care (Curioni et al. 2023). Unlike countries such as Spain and Italy, children are not the predominant network type for older adults' support in Switzerland. Instead, like in France and Austria, more heterogeneity is observed (Furfaro et al. 2024).

In Switzerland, the Federal Social Insurance Office (2020, FSIO) defines older adults' assistance as "measures to support, empower, and facilitate older adults to remain in

their own homes and to lead active, self-determined lives for as long as possible." This assistance provides care and support in two housing types, namely at home for ambulatory facilities and in an institution for stationary services. At-home services include LTC, acute and transitional nursing care, at-home help, meals, and other services. Institutions offer accommodation, 24-h supervision, and medical care. Data on at-home care are collected in the SPITEX database (Swiss Federal Statistical Office 2021a), while SOMED (Swiss Federal Statistical Office 2021d) informs on institutional care. Both gather information from all 26 cantons in Switzerland and are sourced from the Swiss Federal Statistical Office (FSO).

Political scientists, economists, and sociologists frequently conduct research in Switzerland at the level of cantons because of their distinct political institutions, rights, and procedures, as underlined by Walter and Emmenegger (2018). With a highly decentralised system, each of the 26 Swiss cantons has considerable political, economic, and social autonomy, making them intriguing subjects for comparative analysis. Due to this federal configuration, conducting international comparative research is generally avoided (Vatter 2002). The Swiss Federal Council (2007) presents a strategy for assisting older people in their homes, following the report of the Second World Assembly on Ageing in Madrid (United Nations 2002). However, an action plan is not outlined. Furthermore, according to the Federal Office of Public Health (2019), the lack of transparency regarding costs and service quality puts pressure on the health system. Each canton is responsible for providing care and assistance by Article 112c of the Federal Constitution. Therefore, the FSIO (Federal Social Insurance Office 2020) notes that the arrangements for assistance to older adults vary considerably from canton to canton, as does the allocation of tasks and duties between cantons and municipalities.

This article follows a similar research trajectory but diverges significantly from prior studies. The Swiss healthcare system has been studied in terms of cantonal comparisons with a focus on specific aspects, including productivity (Filippini et al. 2022; Schleiniger 2008), intensity of at-home care (Dutoit et al. 2016), demography (Swiss Federal Statistical Office 2018), piloting instruments and responsibilities (Bieri et al. 2020), strategic foundations (Rielle et al. 2010), and legal aspects (Federal Social Insurance Office 2020). However, there is insufficient research on the level of autonomy and assistance provided to older people, as well as qualitative efficiency measures and factors that may clarify differences between cantons. Therefore, conducting a more comprehensive analysis of cantonal strategies and characteristics is essential to establish connections between the strategies adopted, the resulting services delivered, and the associated quality outcomes.

To address the knowledge gap about the heterogeneity of health systems in Swiss cantons, this study aims to identify disparities among them, using indicators related to the care and support provided to older adults. The purpose is to explore the cantonal levels of assistance and housing autonomy. A comparison of the political systems in the cantons can reveal regional differences and allows us to determine the factors affecting the use of corresponding resources. We intend to evaluate the efficiency of services to provide the groundwork for optimizing the care system. We consider cantons as efficient if they offer more services that promote well-being, independence, or lower costs. Explaining disparities between cantons through new variables specific to each canton and examining the efficiency of local strategies are new research aspects. The results of our study should be helpful to governments and private entities to tailor facilities while considering efficiency in the cantons.

For this study, we contend that assigning individual cantons the responsibility for senior citizen care leads to the emergence of different strategies, which, in turn, create disparities in service quality. Based on data from SOMED and SPITEX, we focus on Swiss residents aged 65 and older who received professional care and support at home or used institutions for the elderly in 2020. We present descriptive statistics on care and support indicators by level of assistance and type of housing. We consider three levels of assistance: temporary care and support, permanent support, and permanent care, where care refers to nursing care, and support refers to assistance excluding nursing

care. Regarding housing autonomy, we differentiate between living at home and in an institution. In our analysis, we determine rankings on whether cantons prioritise at-home or institutional care. Furthermore, we rely on regression models to explain the observed differences between cantons. Finally, we assess the efficiency of elderly care provision across cantons.

The remainder of this article is as follows: Section 2 discusses the care and support systems for older people in Switzerland and reviews the current studies. Section 3 describes the data, variables, and methods used. Section 4 presents the results and subsequent discussion. We conclude in Section 5.

2. Care and Support Systems for the Elderly in Switzerland

This section provides an overview of the Swiss care and support systems for older people and reviews the relevant literature.

2.1. Description of the Care and Support Systems

2.1.1. Care and Support Offers

Switzerland is a federal state of 26 cantons within the French, German, and Italian language regions (see also Table A1 in Appendix A). The German-speaking region accounts for over two-thirds of the population, including 19 cantons[1]. The French-speaking region consists of six cantons[2], which collectively represent 25% of the Swiss population. The remaining citizens reside in Ticino (TI), the Italian-speaking canton of Switzerland. Regarding LTC, the law on old-age social insurance recognizes two service categories: at-home and institutional care. The Federal Constitution permits different care use patterns influenced by cantonal policies.

In 2020, services for older people living at home employed 56,763 individuals and provided care for 420,793 individuals, which corresponds to approximately 4.9% of the Swiss population (see Swiss Federal Statistical Office 2021a); 60% of the cases concerned LTC, while approximately 20% required at-home care. Two-thirds of LTC users were older adults, with most of them aged 80 or more. Regarding institutional care facilities, 139,367 employees cared for 158,433 older adults in 2020 (Swiss Federal Statistical Office 2021d). Over 75% of the beneficiaries were 80 years or older. Our study utilises the definition of an institution from the Swiss Confederation (2023), i.e., a service provider is considered an institution as soon as it provides nursing care.

2.1.2. Care and Support Financing

The financing of care and support for older adults in Switzerland is a decentralised system, where responsibility and costs are shared among various stakeholders (Weaver 2012). It involves three main paying agents. First, the first pillar of the Swiss old-age provisions system offers non-means-tested benefits. Second, compulsory health insurance covers medication and ad hoc professional care to prevent health deterioration, either at home or in an institution (Fuino and Wagner 2018). Third, individuals bear the costs of accommodation-related services, such as laundry and meals, making institutional care considerably more expensive than at-home care (Gentili et al. 2017). For expenses beyond their reach, individuals can apply for supplementary support from the national public old-age and survivors' insurance, disability insurance, or social assistance from municipal governments (Courbage et al. 2023; European Commission 2018).

2.1.3. Levels of Assistance and Housing Autonomy

We illustrate Switzerland's care and support options in the matrix depicted in Figure 1. This matrix is inspired by the "Age-Wohn-Matrix" from the Age Stiftung (2012, p. 31), which represents residential autonomy using housing type and different levels of services for security. While categorizing the available services for older people, we consider their housing autonomy levels and needs for assistance. We focus on two main types of housing: at home and in an institution, which correspond to different levels of autonomy. While

ambulant care services are provided to older people living at home, care within institutions is entirely stationary, with all services offered on-site. While at-home care data are found in the SPITEX database (Swiss Federal Statistical Office 2021a), SOMED (Swiss Federal Statistical Office 2021d) is the source of information on institutional care. For each type of housing, we differentiate between three levels of assistance: temporary care and support (1), permanent support (2), and permanent care (3). Receiving temporary care and support reflects a degree of security for patients who do not usually require assistance. However, older adults who depend on permanent support or care regularly necessitate a higher level of assistance. The shades of grey in Figure 1 denote the development level of building structures to meet the increasing dependency needs of the elderly. The lightest stage is for older individuals with self-care capabilities who require minimum support infrastructure, the slightly darker is for those with fragility, and the darkest is for those with vulnerability who demand the highest level of support. For each box in Figure 1, we display the prevalence of usage of the related service for adults aged 65+ in Switzerland. For at-home care, we have acute and transitional care services in 1, at-home help services in 2, and at-home care services in 3. For institutional care, short-term care, and the share of residents receiving light care, and LTC are displayed in 1, 2, and 3, respectively.

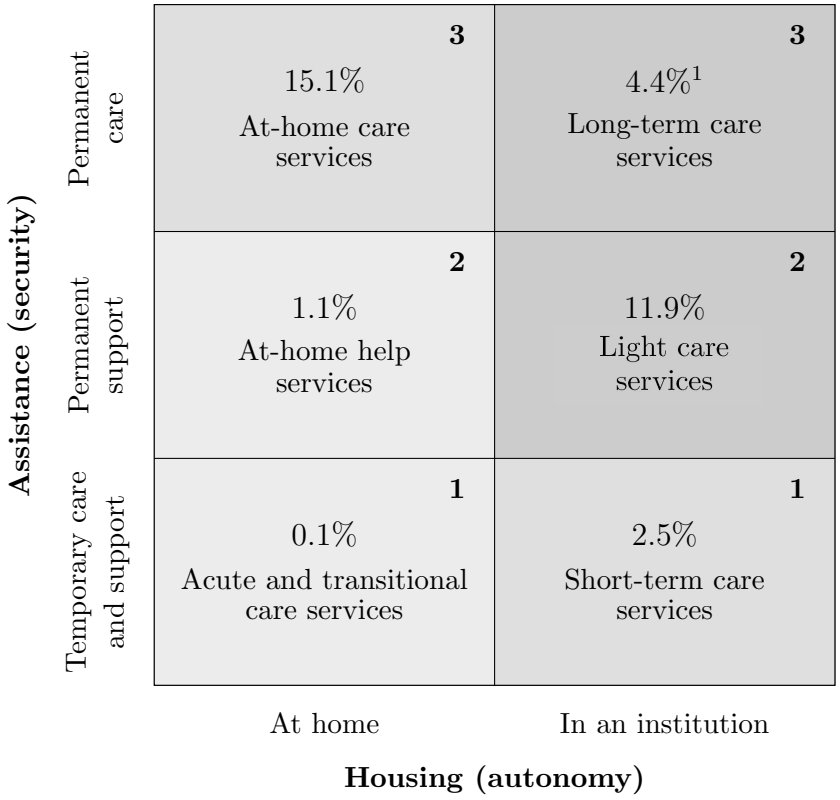

Figure 1. Housing autonomy and assistance levels among adults 65+ in Switzerland. Notes: The graph reports 2020 recourse rates for adults aged 65+ in Switzerland, categorized by self-care capabilities (light gray), fragility, and vulnerability (dark gray). Levels 1 to 3 represent increasing assistance needs. [1]Rate standardized by the Swiss Health Observatory (2023b). Data sources are SPITEX for at-home care (Swiss Federal Statistical Office 2021a) and SOMED for institutional care (Swiss Federal Statistical Office 2021d).

2.2. Swiss Studies on Care and Support for Older People Across Cantons

To examine how Swiss cantons assist older people, the Federal Social Insurance Office (2020) surveyed the cantonal administrations in 2019. The results indicate that five cantons have enacted specific laws related to elderly care. The remaining cantons regulate elderly assistance under social security, personal care, and institutional care laws, which apply

to both institutional and at-home services. Although most cantons have implemented a strategic framework for elderly support services, some favour LTC and institutional planning. In addition, there is significant variation in allocating tasks and responsibilities among municipalities and cantons within and between cantons. As a result, the scope of activities[3] can range from low to moderate, to relatively high throughout different cantons, reflecting the canton's involvement in the care of older citizens. Moreover, certain cantons coordinate their activities with the Confederation's contribution, while others tailor the funding along their own strategies. In its recent study, the Federal Social Insurance Office (2023) outlined the critical needs for improved elderly care, calling for precise care standards, better coordination, and federal government guidance. It advocates for a national care strategy, role clarification, and enhanced legislation to help individuals stay independent longer. The study also calls for uniform legal and funding frameworks for elderly care across Switzerland. They distinguish between three care types, namely, assistance (service provided), care (relation-based support), and nursing (healthcare services).

The Swiss Health Observatory (OBSAN, Swiss Health Observatory 2016) has introduced LTC indicators that can be used to classify cantons into three LTC policy model regions. The first model is the institutional care model, where institutions are the main care providers. This model is prevalent in several cantons in central Switzerland (GL, LU, NW, OW, SZ, and UR) and AR. At-home help and care services are offered as back-end options. In contrast, the cantons GE, JU, NE, TI, and VD belong to the at-home model region as they primarily rely on at-home care services to provide LTC. In these regions, health insurance covers many services offered by at-home caregivers, enabling older citizens to remain in their homes. We observe a mixed model, combining elements of the two mentioned models, in the remaining cantons (AG, BE, FR, GR, SG, SO, TG, ZG, and ZH). In their research, Fuino et al. (2022) outline the geographic distribution of the three LTC models in Switzerland, confirming findings from OBSAN. When comparing the classification between the years 2006 and 2013, many cantons have shifted toward ambulatory care (Swiss Health Observatory 2016). In central Switzerland, where institutional care is the primary pillar of elderly care, short stays in institutions play an important role. In contrast, in areas where care is mainly provided on an at-home basis, like in French- and Italian-speaking cantons, more day and night care facilities have been developed (Dutoit et al. 2016). Meanwhile, the canton of JU has a particularly high share of day and night care facilities. Contrariwise, OW has a shortage of such care (Swiss Health Observatory 2021).

The a+ Swiss Platform Ageing Society (Bieri et al. 2020) commissioned a national study to determine how Swiss municipalities deal with the growing senior population in terms of age-friendly environments. They created an overall index of policies including four dimensions: the use of pilot instruments, the participation of older people, resources, and networking for a senior-friendly policy. None of the seventeen cantons studied reached the maximum index of one. While the cantons of ZH, BE, LU, ZG, and TG have the highest average municipal index value, ranging from 0.6 to 0.7, cantons including GE, FR, SO, BL, AG, and SG meet about half of the indicators, obtaining index values between 0.4 and 0.6. Municipalities in VD, NE, JU, VS, TI, and GR respond to less than half of the indicators, reaching indices between 0.2 and 0.3. In a report commissioned by Gesundheitsförderung Schweiz, a foundation dedicated to promoting health in Switzerland, Rielle et al. (2010) provide an overview of cantonal policies on old age. This study is based on three sources: the strategic and legal foundations of the cantons, the anchoring of old-age policy in the institutional political process, and parliamentary activities in this field. The results, which are from 2010, indicate that the German-speaking part of Switzerland prioritizes health promotion and prevention. In addition, the French-speaking cantons lack basic principles for old-age policy, while the German-speaking cantons are seemingly more advanced in this area.

Studies conducted by Farsi and Filippini (2004) and Filippini (1999) in the Italian-speaking region of Switzerland have examined the cost-efficiency of institutional care. Their results suggest that the institutional form affects institutional efficiency, with non-

profit foundations being more cost-effective than those run by the state administration. At the Swiss level, studies by Filippini et al. (2022), Crivelli et al. (2002), and Farsi et al. (2008) analyze economies of scale and cost inefficiency in institutions. They outline that consolidating small facilities through mergers and acquisitions is crucial to achieving a minimum critical size for efficiency gains. Finally, Schleiniger (2008) observed price and quantity across cantons to evaluate productivity. However, the above research concentrates on cost aspects and neglects the quality of services.

3. Data and Methodology

In this section, we first present the available data, which provide information on at-home and institutional care only. We then describe our variables. Finally, we present our research methodology.

3.1. Available Data

Our analyses focus on the 2020 SOMED and SPITEX secondary public data, which are administered annually by the Swiss Federal Statistical Office at the cantonal level. Due to a lack of data concerning intermediary structures, such as apartments specially designed for the elderly, we only study at-home care (SPITEX database) and institutional care (SOMED database). Personal data collection from the SOMED data is limited to basic information such as sex, year of birth, postal code of residence, date of admission, and date of discharge. The SPITEX data includes information on legal form, range of services, activity fields, details on operating accounts, number of employees, and structure of jobs and clients. All institutions for the elderly and all at-home care organizations, including those under public, non- and for-profit status, and self-employed nurses, must submit their statistics annually. The SOMED dataset in 2020 consists of 1550 institutions, corresponding to a coverage rate of 99.7%. Among the institutions, 386 are public (25%), 462 are private but subsidized (30%), and 702 are private but non-subsidized (45%). The SPITEX sample for the same year includes 2546 service providers, comprising 580 non-profit organizations (23%), 556 for-profit organizations (22%), and 1410 freelance healthcare professionals (55%).

3.2. Description of the Variables

We aim to examine the indicators of senior citizens residing at home or in institutions. Thereby, we distinguish cantons and focus on citizens in Switzerland aged 65 years or older. All variables we discuss below are calculated for each canton and based on the 65+ population. Table 1 describes the variables used in our analysis. Specific indicators are constructed according to the methodology adopted by OBSAN (Swiss Health Observatory 2023c).

3.2.1. At-Home Care

First, we consider the prevalence of recourse to permanent at-home care (R^3_{home}, expressed as number of individuals per 100 inhabitants) based on data from the population and households statistics (STATPOP) provided by the Swiss Federal Statistical Office (2021c). In addition, we consider the average duration (D^3_{home}, expressed as the number of hours per individual) spent on evaluation and advice, examination and treatments, and basic care. For at-home permanent support, we similarly consider the prevalence of receiving at-home help services (R^2_{home} expressed in per mile) and the duration of the support delivered (D^2_{home}). Concerning temporary care and support, the number of individuals for acute and transitional care services per 100,000 inhabitants is coded in R^1_{home} and the number of hours dedicated per individual in D^1_{home}.

Table 1. Description of the variables.

Variable	Description and Measurement
At-home care	
Permanent care	
R^3_{home}	Prevalence of at-home care services (number of individuals per 100 inhabitants)
D^3_{home}	Duration of at-home care services (hours per individual)
Permanent support	
R^2_{home}	Prevalence of at-home help services (number of individuals per 1000 inhabitants)
D^2_{home}	Duration of at-home help services (number of hours per individual)
Temporary care & support	
R^1_{home}	Prevalence of acute and transitional care services (number of individuals per 100,000 inhabitants)
D^1_{home}	Duration of acute and transitional care services (number of hours per individual)
Institutional care	
Permanent care	
$R^3_{\text{inst.}}$	Prevalence of institutional LTC (number of individuals per 100 inhabitants)
$D^3_{\text{inst.}}$	Duration of long-term stays in institution (number of years in the last three years per individual)
$P^3_{\text{inst.}}$	Number of long-term stay places in institutions per 100 inhabitants
$I^3_{\text{inst.}}$	Number of minutes of daily care per individual
Permanent support	
$R^2_{\text{inst.}}$	Share of residents receiving less than 40 min of daily care (in %)
Temporary care & support	
$R^1_{\text{inst.}}$	Prevalence of institutional short-term care (number of individuals per 1000 inhabitants)
$D^1_{\text{inst.}}$	Duration of short-term stays in institution (number of days per individual)
$P^1_{\text{inst.}}$	Number of short-term stay places in institutions per 1000 inhabitants
$R(d/n)^1_{\text{inst.}}$	Prevalence of institutional day/night services (number of individuals per 100,000 inhabitants)
$D(d/n)^1_{\text{inst.}}$	Duration of day/night services (number of days per individual)
$P(d/n)^1_{\text{inst.}}$	Number of day/night services places in institutions per 1000 inhabitants
Demographic and societal indicators	
Share 65+	Share of elderly (number of persons aged 65+ per total population)
GDP	Gross domestic product per inhabitant
Area typology	Share of individuals in rural, urban, and mixed areas
Nationality	Share of Swiss and foreign nationality inhabitants
Political orientation	Share of National Council members in right-wing, left-wing, and other parties
Linguistic region	Language area the canton belongs to (values: German, French/Italian)
Elderly care duty	Main responsible for old-age assistance (values: canton, municipality, both)
Efficiency measures	
Quality	Number of days in institution per full-time equivalent of staff
Back home	Share of individuals returning home (based on all entries in an institution)
Costs	Average daily institutional care costs per individual
Services	Share of non-LTC institutional care days
Counseling	Share of advice and counselling hours (based on total hours spent)

Notes: All variables are based on the population aged 65+ and are available by canton in Switzerland for the year 2020, except for *Political orientation* (2016–2019) and *GDP* (2019). The Swiss Federal Statistical Office (FSO) provides data for demographic and societal indicators (see Statistics of the population and households—STATOP), except for *Elderly care duty* sourced from the Federal Social Insurance Office (FSIO). *R* stands for recourse, *D* for duration, *P* for places, *I* for intensity, and *d*/*n* for day/night.

3.2.2. Institutional Care

We use several indicators to report the state of institutional permanent care, including information on institutional care capacity. The recourse to institutional LTC is calculated as prevalence per 100 inhabitants in $R^3_{\text{inst.}}$. The values from the Swiss Health Observatory (2023b) are standardized so that individual preferences and care supply among cantons can be compared disregarding their population structure. In the variable $D^3_{\text{inst.}}$, we observe the duration of long-term stays in institutions over the last three years. In addition, we report in $P^3_{\text{inst.}}$ the number of long-term places available in institutions per 100 inhabitants aged 65 and over. The average care intensity, i.e., the number of daily minutes of care, is coded in

the variable $I^3_{\text{inst.}}$. Concerning permanent support, we use the indicator $R^2_{\text{inst.}}$ to measure the share of residents with low care dependency in institutions, i.e., the share of those receiving a maximum of 40 min of care per day, among all institutionalized individuals. The variable $R^1_{\text{inst.}}$ indicates the prevalence of institutional care usage for short-term stays in 10,000 inhabitants. We also extract the number of days in an institution for short-term stays ($D^1_{\text{inst.}}$) and the number of places for short-term stays available in institutions per 1000 inhabitants aged 65 and over ($P^1_{\text{inst.}}$). The SOMED database provides data on the recourse of day/night care services ($R(d/n)^1_{\text{inst.}}$, expressed per 100,000 inhabitants). These services offer older people occasional or regular medical/social care during the day and night, enabling them to continue living at home and reducing the burden on family and friends. The average number of days for such services per individual over the year and the number of places for day/night services available in institutions per 1000 inhabitants are coded in $D(d/n)^1_{\text{inst.}}$ and $P(d/n)^1_{\text{inst.}}$, respectively.

3.2.3. Demographic and Societal Indicators

To explain the disparities between cantons, we are interested in the share of citizens aged 65 and above (*Share* 65+) provided by the STATPOP statistics (Swiss Federal Statistical Office 2021c); see also Table A1 in Appendix A. In addition, we consider the wealth of each canton using the Gross Domestic Product per person (*GDP*) for 2019, provided by the FSO (Swiss Federal Statistical Office 2020). Both indicators are also analysed by Reich et al. (2012), who explored regional differences in health care in Switzerland. To incorporate information on the urbanization of each canton, we use the urbanization level of each individual's residence. Based on statistics of the urbanization of municipalities, we calculate the share of individuals living in rural, urban, or mixed areas for each canton (*Area typology*; also see the Swiss Federal Statistical Office 2014). This approach is inspired by Busato et al. (2012), who examined geographic variation in the cost of ambulatory care in Switzerland, and by Van der Weg and Streuli (2003), who investigated access to ambulatory care in rural, urban, and intermediate areas. The latter also studied whether or not cantons with a higher rate of foreigners are different in terms of care services. Thus, we will also verify if the proportion of foreigners in a canton (*Nationality*) impacts care and support services. Information for the above-mentioned variables is again obtained from the STATPOP statistics. Furthermore, Vatter and Rüefli (2003) question whether or not political factors affect healthcare expenditures. To examine the potential impact of the political orientation of a canton on their respective care and support systems, we use the statistics of the National Council elections (Swiss Federal Statistical Office 2021b). Following Vatter and Rüefli (2003), we separate the political parties into three groups: right-wing, left-wing, and other (*Political orientation*) and consider the proportion of elected members between 2016 and 2019. Because Gentili et al. (2017) found evidence of cultural factors influencing LTC, we consider the variable *Linguistic region* encoding the language area a canton belongs to (German or French/Italian). Ultimately, we refer to the Federal Social Insurance Office (FSIO) guidelines on old-age assistance and its associated responsibilities. Based on legal provisions and strategic document analyses, the FSIO identifies different models of task allocation for elderly care, which vary among cantons and municipalities. Depending on the model, the responsibility is mainly with the canton, the municipality, or both (*Elderly care duty*) (see Federal Social Insurance Office 2020). Vatter and Rüefli (2003) evaluated the impact of the above-mentioned demographic and societal indicators, which motivated our choice to study them as well.

3.3. Methods

To better understand differences in care and support for older people across cantons, we opt for three approaches: ranking the cantons, running univariate regressions, and calculating efficiency measures.

3.3.1. Ranking

Using the previously described data, we first rank most of the variables in the "at-home" and "institutional" care sets, as shown in Table 1. This classification helps us to determine if the cantonal means are homogeneous, or if there are notable differences between the cantons.

3.3.2. Univariate Regressions

In the second step, we use demographic and societal indicators as independent variables and perform univariate linear regressions on the care variables. We aim to identify factors that may explain the observed differences between the cantons in the care indicators, which are our dependent variables. All variables are continuous except for *Linguistic region*, which is binary, and the *Elderly care duty* (categorical variables transformed into three binary variables using one-hot encoding). The other independent variables are expressed as shares or an absolute number, as in the case of *GDP*.

3.3.3. Efficiency Measures

Finally, we evaluate the efficiency of the care provided. Unlike previous studies, we measure efficiency from various perspectives. We focus on cantonal-level information to assess the canton's support for older adults' well-being and independence, as well as its effectiveness in managing institutional costs. To evaluate the level of staff available in institutions, we divide the number of days spent in institutional care by the number of full-time equivalent staff for these institutions (*Quality*). This measure captures institutional care and support intensity, so a lower value suggests a more intensive level of care, corresponding to more staff available per patient. However, this measure does not consider cost considerations. The share of individuals returning home from an institution (*Back home*) helps us to discern which cantons prioritize ageing in place, i.e., at home, focusing on individuals leaving institutional care and returning to their home. The indicator annually considers the number of individuals returning home over the number of entries in an institution. A higher value suggests a cantonal strategy oriented toward ageing in place, potentially leading to more cost-efficient care. This approach favours elderly individuals staying in their familiar environment and remaining independent. Financially, the average daily cost per individual in institutions provides valuable insights into the costs incurred by the cantonal strategy (*Costs*). Thus, we divide the total institutional operating expenditures, including day and night care, by the number of days that individuals have spent in institutions. A lower value indicates more cost-efficient care, while a higher value suggests higher costs per day of care. We examine the proportion of services, excluding LTC (*Services*), in various cantons to determine the extent to which they rely on services apart from LTC (i.e., short-term stays, day/night services, daycare, and acute care and transition days). We take all the days in institutional care, subtract the days in long-term stay, and then divide the result by the total number of days. Lastly, some cantons offer more advice and counselling for older individuals at home. Thus, we calculate the proportion of advice and counselling hours on the total hours spent on people aged 65 and over (*Counseling*). A higher proportion suggests a priority for providing these services, contributing to a holistic approach to elderly care. It is essential to note that although these indicators offer valuable insights, they come with limitations. While the values depend on decisions from cantonal authorities, other factors, including demographic changes, affect the indicators. In addition, their interpretation depends on the context and specific goals of the cantonal strategies. Higher values for some indicators may indicate intensive or specialized care, but may also be associated with higher costs. Conversely, lower values may suggest cost-effective care but may not always reflect the quality or comprehensiveness of the services. Considering these indicators collectively and in the context of individual cantonal strategies is crucial to draw meaningful conclusions about efficiency and quality in elderly care.

4. Descriptive Statistics, Results, and Discussion

In Section 4.1, we report the descriptive statistics on old-age care and support, structuring our presentation along dimensions of the matrix in Figure 1. We investigate the rankings of cantons for a selection of variables in Section 4.2. We develop and discuss the results of the single regressions in Section 4.3 and, in Section 4.4, we examine the efficiency measures.

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics for the at-home and institutional care variables (cf. Table 1) for 2020. Thereby, we report the three cantons with the highest and lowest values, denoted by "+" and "−"signs, respectively, along with the average across all cantons for comparison.

4.1.1. At-Home Care

Regarding permanent care for people living at home, only French-speaking cantons (NE, VD, and FR) rank in the top three. Thus, with the ease of ageing at home, they offer higher independence to senior citizens by setting the framework for the latter to stay in their community (Davey et al. 2004). On the opposite side of the spectrum, there are only German-speaking cantons. This indicates that the policy of the French-speaking cantons is rather oriented towards at-home care while UR, OW, and NW, being smaller cantons in Central Switzerland, have chosen not to favour ambulatory care. Although the latter may not have many patients in absolute terms, the number of hours spent per individual are highest. Conversely, NE and FR, along with GL, have the lowest number of hours per individual. This may hint towards more cost-effective systems.

For permanent support, older people in the canton of BS often rely on this type of assistance with a high care intensity (high values for both R^2_{home} and D^2_{home}) and consequently generate more expenses for the canton. However, this trend is not seen in the cantons of JU and GR, where permanent support is widely used without leading to more hours per individual (see D^2_{home} in Table 3). The cantons of UR, SZ, and NE have a lower usage of permanent support. Smaller cantons like AI, OW, and AR spend less time on this type of assistance. This could be due to the critical size of the canton, which may justify differences in spending. These cantons may have a larger number of institutions, making it easier for older citizens to be referred to institutional care when they face a lack of autonomy.

Temporary care and support services provided at home, among the cantons with available data, are more frequently used in AR, SG, and BL. Older people are, therefore, more often referred to their homes for further care and recovery. In cantons such as SZ, LU, and GE, the number of hours of care per individual is higher, indicating that more support is required in the long run.

4.1.2. Institutional Care

Institutional permanent care is widely used in AR, GL, and UR. In contrast, VD, GE, and BL are the three cantons with the smallest share of individuals in institutional care. VD mainly turns to at-home care, reducing stationary care drastically. Conversely, AR, GL, and UR have a stationary care strategy, as evidenced by the higher prevalence and the longer average duration of stays in institutions. SH and BS follow a similar trend, with more places in institutions per inhabitant. However, French-speaking cantons provide the highest average duration of daily institutional care. In JU, GE, and VD the intensity of care (I^3_{inst}) is significantly higher. This may be due to the higher age of entry into institutions (Swiss Health Observatory 2023a). The later an individual enters an institution, the more likely they will end up with a declining health status. In the mentioned French-speaking cantons, older people receive care at home for longer until their level of autonomy no longer allows it; only then are they directed to institutional care.

Concerning permanent support, the statistics confirm our prior observations. Small cantons in the German-speaking part of Switzerland comprise more residents with little or no care in institutions. We noted earlier that the canton of GL had the lowest average

duration of daily institutional care, which is directly linked to the variable reporting residents requiring less care, as this canton has the highest respective value. Our findings are also confirmed for the French-speaking cantons. JU, GE, and NE have an extremely low prevalence of such residents in their institutions since they prefer to encourage people to age in their homes.

Table 2. Descriptive statistics on the old-age care and support indicators in Swiss cantons: average and first and last three cantons in 2020.

At-Home Care				Institutional Care			
Permanent care							
R^3_{home} (CH: 15.1)				$R^3_{\text{inst.}}$ (CH: 4.4)			
+	NE: 33.1	VD: 22.9	FR: 22.2	+	AR: 6.1	GL: 6.0	UR: 5.9
−	UR: 6.5	OW: 6.7	NW: 6.8	−	VD: 3.3	GE: 3.5	BL: 3.8
D^3_{home} (CH: 62.8)				$D^3_{\text{inst.}}$ (CH: 2.8)			
+	NW: 97.0	OW: 82.3	BS: 79.0	+	AI: 3.3	AR: 3.2	GL: 3.2
−	GL: 38.0	NE: 38.2	FR: 39.6	−	AG: 2.6	BS: 2.6	BE: 2.6
				$P^3_{\text{inst.}}$ (CH: 6.0)			
				+	AR: 9.3	BS: 8.1	SH: 8.0
				−	VS: 4.5	BL: 4.7	JU: 4.9
				$I^3_{\text{inst.}}$ (CH: 125.2)			
				+	JU: 204.2	GE: 188.3	VD: 186.7
				−	GL: 88.8	SG: 93.1	ZG: 98.5
Permanent support							
R^2_{home} (CH: 11.2)				$R^2_{\text{inst.}}$ (CH: 11.9)			
+	BS: 19.4	JU: 18.8	GR: 17.8	+	GL: 29.3	SG: 22.6	AR: 21.4
−	UR: 5.8	SZ: 6.5	NE: 7.3	−	GE: 0.1	VD: 0.2	JU: 0.3
D^2_{home} (CH: 56.3)							
+	BL: 89.5	BS: 75.8	LU: 73.4				
−	AI: 21.2	OW: 25.7	AR: 30.1				
Temporary care & support							
R^1_{home} (CH: 92.6)				$R^1_{\text{inst.}}$ (CH: 25.3)			
+	AR: 776.4	SG: 579.2	BL: 578.9	+	OW: 193.7	GL: 51.9	TI: 48.9
−	LU: 1.3	SZ: 6.7	VD: 7.4	−	AI: 3.1	GE: 3.1	FR: 7.1
D^1_{home} (CH: 10.9)				$D^1_{\text{inst.}}$ (CH: 33.9)			
+	SZ: 37.5	LU: 16.0	GE: 13.2	+	UR: 49.4	FR: 44.3	NE: 43.4
−	VD: 3.0	BS: 4.9	SH: 5.8	−	OW: 18.8	AI: 20.8	GE: 20.9
				$P^1_{\text{inst.}}$ (CH: 1.0)			
				+	OW: 11.2	NE: 2.5	VS/VD: 1.4
				−	GE: 0.1	NW: 0.2	AI: 0.3
				$R(d/n)^1_{\text{inst.}}$ (CH: 61.5)			
				+	VD: 276.2	NE: 180.8	BS: 144.9
				−	GL: 2.4	SZ: 3.1	LU: 8.9
				$D(d/n)^1_{\text{inst.}}$ (CH: 42.4)			
				+	BS: 65.8	VD: 49.8	SZ: 43.2
				−	GL: 13.0	SH: 23.2	AR: 24.9
				$P(d/n)^1_{\text{inst.}}$ (CH: 1.2)			
				+	VD: 4.3	BS: 3.5	NE: 2.8
				−	LU: 0.2	SO: 0.2	SH: 0.5

Notes: "CH" indicates the average over all cantons. The "+" and "−" signs introduce the list of three cantons with the highest and lowest values, respectively. The abbreviation "d/n" stands for day/night services. For R^1_{home}, D^1_{home}, $R(d/n)^1_{\text{inst.}}$, $D(d/n)^1_{\text{inst.}}$, and $P(d/n)^1_{\text{inst.}}$, missing data occurs for several cantons. See Table 1 for the variable definitions.

For temporary care and support, there is no clear distinction between the linguistic regions of Switzerland. The surprisingly high number of places in institutions for short stays provided by the cantons of VD and NE could be explained by their strategy to keep older people at home as long as possible. These short-term stays allow individuals to benefit from comprehensive care to restore their health after an episode of complications, and then return home. This is probably not the strategy of OW, which offers even more places. This is possibly explained by OW welcoming individuals from neighbouring cantons. The prevalence of such care in OW is almost eight times the Swiss average and reinforces our presumption. However, we observe a shorter duration, which leads us to conclude that individuals are oriented towards institutional care rather than to returning home. To a lesser extent, but still with figures twice the Swiss average, GL and TI are in a similar situation. The situation in VD and NE is also atypical for day and night structures in institutions. Both have a high number of places, which confirms the findings of OBSAN (Swiss Health Observatory 2016). Indeed, they mention that there are more day and night care facilities in French- and Italian-speaking cantons, which have an ambulatory orientation, actively promoting this practice in comparison to the average. BS also differs with its high number of places, average duration, and prevalence. Recall that the services provided in these cantons are supplementary to those already offered in the other care types, since several cantons do not have such facilities.

4.2. Rankings of Cantons

Table 3 shows the rankings of the cantons for selected variables of the SPITEX and SOMED statistics. The gradient displayed highlights the differences between the cantons and helps to identify groups with extreme values.

4.2.1. At-Home Care

According to the prevalence of permanent at-home care (R^3_{home}), there is a substantial difference between the French-/Italian- and German-speaking areas of Switzerland. The seven cantons with the highest rates are all French- and Italian-speaking cantons, except for BS, which has also developed this orientation more intensively than the Swiss average. This indicates a cultural division within the country, reflecting the findings of OBSAN (Swiss Health Observatory 2016), which groups the cantons of GE, JU, NE, TI, and VD (French- and Italian-speaking cantons) together due to their similarities regarding care for older people at home. According to OBSAN (Swiss Health Observatory 2021), this observation could be explained by the fact that relatives in French- and Italian-speaking cantons provide more care services than in German-speaking cantons. Thus, this cultural difference could be the origin of a greater desire to keep older individuals at home. Despite its high use of at-home care (D^3_{home}), the French-speaking part of Switzerland is in the middle range. With many clients benefiting from this service, there are possibly more older citizens with lower needs. We do not observe a pattern in the recourse to permanent at-home support (R^2_{home}). German-speaking cantons are more interested in support than in permanent at-home care. Assisting older people with needs helps them stay at home, maintain an active lifestyle, and live in a self-determined manner (Federal Social Insurance Office 2020). The average number of hours per individual for permanent support (D^2_{home}) also varies between the cantons. Those with the highest prevalence are not necessarily the ones with the highest duration. We notice that smaller cantons such as AR, SG, BL, and AI (for the population statistics, see Table A1 in Appendix A) use more acute and transitional care services (R^1_{home}). Nonetheless, these cantons do not necessarily present a longer duration of these services (D^1_{home}). Such cantons might readily guide individuals towards temporary help, even for less severe cases.

Table 3. Ranking of the cantons along selected old-age care and support indicators in 2020.

		Permanent Care				Permanent Support				Temporary Care and Support			
		R^3_{home}		D^3_{home}		R^2_{home}		D^2_{home}		R^1_{home}		D^1_{home}	
At-home care	1	NE	33.1	NW	97.0	BS	19.4	BL	89.5	AR	776.4	SZ	37.5
	2	VD	22.9	OW	82.3	JU	18.7	BS	75.8	SG	579.2	LU	16.0
	3	FR	22.2	BS	79.0	GR	17.8	LU	73.4	BL	579.0	GE	13.2
	4	TI	22.0	BL	76.8	SH	15.4	ZG	64.9	AI	337.6	ZH	13.0
	5	JU	21.9	BE	74.4	AI	14.8	ZH	62.7	TG	280.3	TG	12.6
	6	GE	18.1	UR	73.5	BL	14.0	SG	62.0	GE	209.9	BL	11.4
	7	VS	16.8	AI	72.5	AR	13.6	GE	60.3	ZH	47.1	GL	11.0
	8	BS	16.0	JU	72.4	SG	13.6	TI	59.2	BS	38.7	AR	10.7
	9	SO	13.8	TI	70.8	VS	12.0	VD	55.0	SH	27.8	AI	9.5
	10	BE	13.5	VD	70.1	ZH	11.7	SZ	51.2	GL	11.9	SG	9.1
	11	LU	13.1	ZH	69.2	AG	11.5	TG	51.1	VD	7.4	SH	5.8
	12	TG	13.1	GE	68.3	NW	11.4	NW	50.3	SZ	6.7	BS	4.9
	13	ZH	12.9	GR	62.9	SO	11.2	BE	49.0	LU	1.3	VD	3.0
	14	GL	12.6	AR	62.9	VD	10.9	AG	47.6				
	15	SG	12.3	SH	58.8	GE	10.8	SH	47.3				
	16	SH	11.8	LU	57.0	LU	10.5	GR	46.1				
	17	AG	11.5	SO	56.3	ZG	10.4	SO	45.3				
	18	GR	10.7	AG	56.2	FR	9.9	UR	43.3				
	19	BL	10.6	ZG	53.9	TI	9.3	NE	42.9				
	20	SZ	9.7	SZ	53.8	BE	8.6	VS	40.0				
	21	ZG	9.6	TG	52.7	GL	8.3	JU	37.1				
	22	AI	8.2	SG	47.5	OW	8.3	GL	36.9				
	23	AR	7.2	VS	44.5	TG	7.6	FR	33.2				
	24	NW	6.8	FR	39.6	NE	7.3	AR	30.1				
	25	OW	6.7	NE	38.2	SZ	6.5	OW	25.7				
	26	UR	6.5	GL	38.0	UR	5.8	AI	21.2				
	CH		15.1		62.8		11.2		56.3		92.6		10.9
		$R^3_{\text{inst.}}$		$D^3_{\text{inst.}}$		$P^3_{\text{inst.}}$		$R^2_{\text{inst.}}$		$R^1_{\text{inst.}}$		$D^1_{\text{inst.}}$		$P^1_{\text{inst.}}$	
Institutional care	1	AR	6.1	AI	3.3	AR	9.3	GL	29.3	OW	193.7	UR	49.4	OW	11.2
	2	GL	6.0	GL	3.2	BS	8.1	SG	22.6	GL	51.9	SZ	44.3	NE	2.5
	3	UR	5.9	AR	3.2	SH	8.0	AR	21.4	TI	48.9	FR	43.9	AR	1.9
	4	SH	5.6	GE	3.2	GL	7.8	ZH	20.0	AR	37.2	NE	43.4	VS	1.4
	5	SZ	5.3	UR	3.1	UR	7.0	SH	19.7	LU	36.7	AG	43.1	SO	1.4
	6	SG	5.3	ZG	3.1	LU	6.7	ZG	18.9	BE	34.3	SH	39.9	VD	1.4
	7	LU	5.2	SG	3.1	ZH	6.6	TG	18.8	NE	31.0	ZH	39.2	FR	1.3
	8	BS	5.1	TI	3.1	SZ	6.6	OW	17.3	SO	28.7	SG	38.3	TI	1.2
	9	BE	4.8	OW	3.0	SG	6.6	UR	16.4	NW	27.1	VS	37.9	TG	1.0
	10	OW	4.8	FR	2.9	BE	6.4	AI	15.9	VD	25.8	SO	36.4	AG	0.9
	11	NW	4.8	NE	2.9	NE	6.2	NW	15.3	UR	25.3	AR	36.2	ZG	0.9
	12	FR	4.8	ZH	2.8	AI	6.0	AG	14.6	ZH	25.0	BE	35.2	BE	0.9
	13	AI	4.8	SZ	2.8	TG	6.0	SZ	14.4	SZ	23.9	GL	35.1	ZH	0.9
	14	ZH	4.6	NW	2.8	TI	5.7	LU	13.7	TG	23.3	LU	34.2	UR	0.8
	15	TG	4.6	TG	2.8	OW	5.6	BL	13.2	ZG	23.1	GR	32.4	BL	0.8
	16	ZG	4.4	VS	2.8	GR	5.6	SO	11.0	AG	22.3	TG	31.8	SG	0.7
	17	GR	4.4	JU	2.8	NW	5.2	BS	10.8	SG	20.7	ZG	31.4	LU	0.6
	18	NE	4.4	LU	2.7	FR	5.2	GR	10.5	BL	20.6	BL	30.5	SH	0.6
	19	AG	4.2	BL	2.7	AG	5.2	BE	9.0	VS	20.0	NW	29.2	GR	0.5
	20	VS	4.0	SH	2.7	ZG	5.1	TI	5.2	GR	19.3	BS	27.3	BS	0.4
	21	SO	3.8	GR	2.7	SO	5.1	FR	5.0	SH	11.6	TI	25.4	SZ	0.3
	22	BL	3.8	VD	2.7	VD	5.1	VS	1.9	BS	10.5	JU	23.9	JU	0.3
	23	TI	3.8	BE	2.6	GE	5.0	NE	1.0	JU	7.5	VD	22.2	AI	0.3
	24	JU	3.8	SO	2.6	JU	4.9	JU	0.3	FR	7.1	GE	20.9	NW	0.2
	25	GE	3.5	BS	2.6	BL	4.7	VD	0.2	AI	3.1	AI	20.8	GE	0.1
	26	VD	3.4	AG	2.6	VS	4.6	GE	0.1	GE	3.1	OW	18.8	GL	0.0
	CH		4.4		2.8		5.9		11.9		25.3		33.9		1.0

Notes: Additional institutional care rankings appear in Table A2 in Appendix A. See Table 1 for the variable definitions.

4.2.2. Institutional Care

We distinguish three groups of cantons that use institutional care ($R^3_{\text{inst.}}$) from most often to the least often: smaller cantons, cantons close to the average value, and French- and Italian-speaking cantons. Building an additional institution in a small canton could significantly increase its proportion of institutional care supply per individual. We also find these results for the French and Italian parts of Switzerland in the report conducted by OBSAN (Swiss Health Observatory 2021). These regions' high at-home care prevalence (R^3_{home}) contrasts these findings. When the prevalence of at-home care services increases, the usage of institutional care decreases. This suggests that at-home care services can

offer an alternative to institutional care. Important differences are observed between small and large cantons in the number of places in institutions indicator ($P^3_{\text{inst.}}$). Small cantons have more places relatively to their larger counterparts. Overall, the institutional care prevalence matches the available places. Once again, French-speaking cantons rank at the bottom of the list. Moreover, the statistics reveal that small cantons with higher prevalence and more places also allocate more time to patient care ($D^3_{\text{inst.}}$). Furthermore, we mentioned that French-speaking cantons have particularly few residents with low care needs ($R^2_{\text{inst.}}$). This trend is especially pronounced when we consider the extreme values. In some cantons, a significant proportion of clients can stay at home. According to Bayer and Harper (2000), keeping older citizens at home for extended periods diminishes healthcare costs. For short-term care, OW is by far heading the ranking in terms of prevalence ($R^1_{\text{inst.}}$). This is presumably linked to the attractive option OW provides for individuals requiring temporary care from neighbouring cantons. The French-speaking part of Switzerland has a dispersed interest in these services, with individuals from SH, BS, JU, FR, AI, and GE using these services the least. All cantons have similar short-term stay durations ($D^1_{\text{inst.}}$). Patients generally come for specific problems and mostly recover within that period.

4.3. Regression Statistics

In Table 4, we present the results from the univariate regressions in which we regress selected permanent and temporary care and support indicators on the demographic and societal covariates. For each regression, we report the covariates' coefficient and significance level. Positive coefficients indicate a positive impact on the dependent variable we aim to explain.

4.3.1. At-Home Care

In permanent at-home care, we observe that cantons with more foreigners use at-home care more frequently. The higher use of alternatives to institutional care in cantons with more foreigners is also observed by Van der Weg and Streuli (2003). Politics also play a role in the prevalence of at-home care, with left-wing cantons providing significantly more at-home care services than other cantons. In addition, our regression results confirm our observation from descriptive statistics that the linguistic region is significant in explaining the interest in at-home care. The coefficients are unsurprisingly significantly negative for the German-speaking cantons. Cantons with responsibilities for elderly care on the cantonal level are more likely to develop at-home care. Conversely, cantons where municipalities are mainly in charge of elderly care are less likely to lean towards at-home care. The duration for permanent care is higher in cantons with a higher proportion of adults over 65 years, which is consistent with the findings of Reich et al. (2012) and Vatter and Rüefli (2003), who observe more spending in cantons with an ageing population. When considering permanent support, the significance of the language variable becomes apparent, with a higher recourse in German-speaking cantons. A higher GDP and the cantonal typology significantly impact the amount of time spent on at-home help, with urban cantons consuming more hours. This may be linked to the greater availability of services. Vatter and Rüefli (2003) also find a correlation between wealthy cantons and higher health insurance costs. The studies of Busato et al. (2012), Van der Weg and Streuli (2003), and Vatter and Rüefli (2003) also show differences in the provision of care based on regions. Nationality is also a significant factor, with cantons having a higher proportion of Swiss using fewer hours per client for at-home help services. This is confirmed by Reich et al. (2012), who find more care expenditures in areas with a higher proportion of foreigners. The average duration is also higher in left-wing cantons. Furthermore, when cantons are responsible for elderly care, there are fewer hours spent on at-home help. The opposite trend is observed for cantons where this responsibility is with the municipalities.

Table 4. Univariate regression results on 2020 cantonal level data for selected old-age care and support indicators.

	At-Home Care		Institutional Care		
Permanent care	R^3_{home}	D^3_{home}	$R^3_{\text{inst.}}$	$D^3_{\text{inst.}}$	$P^3_{\text{inst.}}$
Share 65+	−62.546	258.784 ·	5.038	−0.641	0.453
GDP	2.690	6.410	−0.173	−0.043	0.614
Area typology: rural	−8.010	15.128	0.377	0.188	−0.527
Area typology: urban	5.316	−8.248	−0.406	−0.091	0.408
Area typology: mixed	11.855	−28.100	−0.064	−0.385	0.593
Nationality: Swiss	−38.308 *	43.281	3.992 ·	0.363	0.823
Political orientation: right-wing	−0.191 *	−0.006	0.026 *	0.002	0.044 **
Political orientation: left-wing	0.322 ***	−0.259	−0.023 *	−0.005	−0.013
Political orientation: other parties	−0.142	0.306	−0.005	0.003	8.559
Linguistic region: German	−11.555 ***	6.751	0.964 **	−0.051	1.157 *
Elderly care duty: canton	6.903 *	−5.256	−0.126	0.227 *	0.039
Elderly care duty: both	−1.308	6.154	0.046	−0.046	0.008
Elderly care duty: municipality	−3.499 ·	−3.391	0.038	−0.111	−0.038
Permanent support	R^2_{home}	D^2_{home}	$R^2_{\text{inst.}}$		
Share 65+	47.895	−53.361	37.896		
GDP	3.720	23.860 *	−0.751		
Area typology: rural	2.253	−40.558 **	3.394		
Area typology: urban	−1.489	49.341 ***	0.213		
Area typology: mixed	−3.354	−11.360	−12.872		
Nationality: Swiss	−3.657	−121.732 **	26.903		
Political orientation: right-wing	−0.035	−0.172	0.292 **		
Political orientation: left-wing	0.045	0.507 *	−0.283 **		
Political orientation: other parties	−0.010	−0.379	−0.023		
Linguistic region: German	0.327 ·	4.430	14.506 ***		
Elderly care duty: canton	0.232	−13.116 ·	−2.746		
Elderly care duty: both	−2.116	−6.201	−3.331		
Elderly care duty: municipality	2.313	16.841 **	5.911 ·		
Temporary care and support			$R^1_{\text{inst.}}$	$D^1_{\text{inst.}}$	$P^1_{\text{inst.}}$
Share 65+			187.777	−27.435	−1.630
GDP			−14.750	−5.960	−0.762
Area typology: rural			47.070	−13.426 *	2.879
Area typology: urban			−28.938	3.987	−2.438
Area typology: mixed			−77.002	35.549 **	−3.173
Nationality: Swiss			133.597	15.102	6.606
Political orientation: right-wing			0.516	0.098	0.013
Political orientation: left-wing			−1.028 *	0.014	−0.047
Political orientation: other parties			0.568	−0.134	0.043
Linguistic region: German			13.092	3.309	0.175
Elderly care duty: canton			−1.955	−4.680	−0.280
Elderly care duty: both			10.647	−0.336	0.870
Elderly care duty: municipality			−11.070	3.808	−0.825

Notes: The significance levels are $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. *GDP* coefficients are represented as $\times 10^{-5}$. Intercepts are not displayed. See Table 1 for the variable definitions.

4.3.2. Institutional Care

The proportion of Swiss nationals in a canton is related to the recourse to institutional permanent care at a low significance level ".". Our results indicate that Swiss nationals prefer institutional care, while cantons with more foreigners prefer at-home care. Similarly, cantons with a right-wing policy tend to have higher rates of institutional care, while those with a left-wing policy favour at-home care. As many French- and Italian-speaking cantons lean towards left-wing policies, the conclusion for the language variable is the same, with German-speaking cantons yielding a higher recourse rate. It is unclear whether at-home care services are more prevalent due to political orientation or to a cultural difference reflected in language. Accordingly, the number of places in institutional care is higher in

right-wing and German-speaking cantons, as these variables remain significant. Concerning residents with little or no care needed in institutions, political orientation and linguistic regions are significant. French- and Italian-speaking and left-wing cantons have fewer such residents. This suggests that the more at-home care is provided, the later older people enter into institutions. When municipalities assume responsibility for ageing-related tasks, the number of individuals who require minimal or no care in institutions increases. Consistent with the earlier observations, when cantons take responsibility for ageing-related tasks, they aim to promote at-home care services to delay admission to institutional care. Regarding temporary care and support, the recourse is lower for left-wing cantons, for which the variable is significant. Moreover, we observe that the average length in institutions for this short-term care is lower in rural areas but higher in mixed-typology cantons.

4.4. Efficiency of the Care and Support Strategy

With the efficiency measures that we report in the following, we aim to identify where cantons could improve elderly care and support while achieving cost savings or delivering a specific service more cost-effectively. In this part, we focus on ten cantons (AG, BE, BL, GE, LU, SG, TI, VD, VS, ZH), excluding smaller cantons as their size can skew statistics related to the population size when, e.g., considering building care facilities. Table 5 shows the ranking of the cantons along the efficiency measures presented in Section 3.3, with the cantons at the top of each ranking being the best performers. The row "CH" indicates the average calculated over all Switzerland.

Table 5. Efficiency indicators for ten cantons in Switzerland in 2020.

Quality		*Back Home*		*Costs*		*Services*		*Counseling*	
TI	300.50	VD	42.28	SG	279.34	VD	6.54	VS	12.04
VD	314.14	ZH	40.60	VS	287.93	AG	3.33	VD	9.72
ZH	324.66	LU	35.15	BE	301.50	TI	3.19	GE	9.05
VS	337.26	TI	33.19	LU	303.50	ZH	3.01	BE	7.77
LU	340.39	AG	28.81	AG	308.57	LU	2.87	SG	7.57
AG	340.82	BE	27.88	VD	333.24	VS	2.80	BL	7.52
GE	341.85	BL	27.22	TI	337.45	BE	2.73	AG	7.46
BL	342.91	SG	23.20	BL	341.56	BL	2.25	ZH	6.70
BE	347.93	VS	22.58	ZH	394.12	SG	1.81	LU	6.48
SG	388.10	GE	8.12	GE	424.96	GE	0.21	TI	5.71
CH	338.12	CH	31.86	CH	329.14	CH	2.88	CH	8.05

Note: See Table 1 for the variable definitions.

4.4.1. At-Home Care

In the indicator *Services*, we consider the share of non-LTC institutional care days. We observe that the canton of VD provides many more structures than other cantons, meeting the World Health Organization (2017) objective to offer a functional quality of life through a diversified offer. In reverse, interestingly, such structures are very limited in the neighbouring canton of GE. Regarding the proportion of advice and counselling hours to older people (*Counseling*), three cantons from French-speaking Switzerland serve as a model. The other seven cantons are below the average. In particular, TI, LU, and ZH have a smaller share of hours dedicated to counselling than the rest.

4.4.2. Institutional Care

Comparing the number of days in institution per full-time equivalent of staff (*Quality*), we identify two extreme values in TI (300.50) and SG (388.10). More personnel are available in TI than in SG, where the burden on the staff is approximately 30% higher. According to this measure, care is better in TI, followed by VD and ZH. We observe that the other six cantons are close to the average. Furthermore, the statistics on the share of individuals returning home after institutional care (*Back home*) reflects the approach of each canton

towards ageing. We note that VD and ZH have a much higher proportion of residents returning home (42.28 and 40.60%). This suggests that residing in an institution is not necessarily the final stage of housing for older people in these cantons. Temporary care stays may allow them to return home and live independently. This does not seem to be the case in GE, where only 8% return home. This number is significantly lower than the Swiss average (31.9%). Finally, the daily institutional care costs (*Costs*) are relatively similar (CH average: 329.14), except for the city cantons of GE and ZH, where costs spike to 424.96 and 394.12, respectively. Higher wages or infrastructure costs may explain this.

To close this section, we report the interesting correlation between the *Services* and *Backhome* variables in Figure 2. We find that the share of patients returning home strongly correlates (correlation coefficient: 0.815) with the proportion of (non-LTC) intermediate structures offered. Thus, cantons with a more diversified care offer would see more individuals returning home.

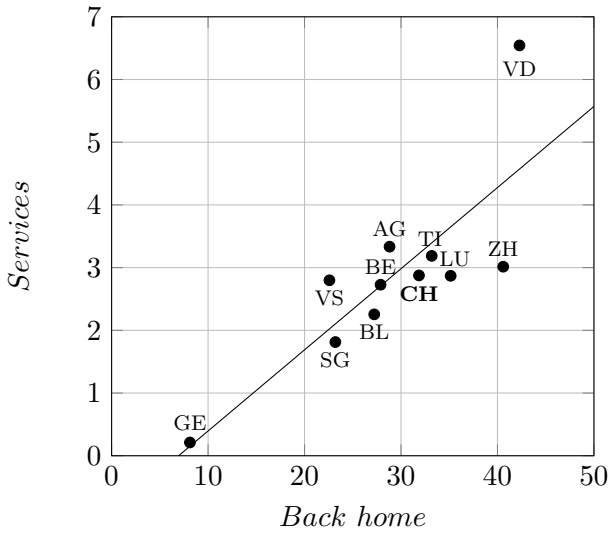

Figure 2. Relationship between the share of individuals returning home and the share of non-LTC institutional care days. Note: The line on the graph illustrates the linear regression performed on the data from the 10 cantons in 2020.

5. Conclusions

This article delves into the complex landscape of elderly care and support in Switzerland, where the responsibility for assisting older people is, to a large extent, delegated to the cantons. Our analyses bridge a gap in the existing literature by examining the level of autonomy and support offered, assessing efficiency with qualitative measures, and identifying potential factors explaining the differences between cantons. We identify differences among the cantons in the existing old-age care and support, with several indicators calculated from the SPITEX and SOMED statistics provided by the Swiss Federal Statistical Office.

Our research provides insights into the distinct approaches taken by different cantons in Switzerland to address the needs of their ageing population. Notably, French- and Italian-speaking cantons prioritize ambulatory care, potentially influenced by political inclinations, while German-speaking regions lean more towards institutional care. The study reveals the critical role of urban density in shaping the availability of at-home care services, emphasizing the importance of geographical factors in care provision. Cantons with a strategy focused on stationary care facilities tend to have in their institutions a higher rate of patients with low levels of care needs, who could potentially still live at home.

We must acknowledge certain limitations of our study. The Swiss Federal Statistical Office does not collect data on apartments with services for older individuals, which leaves gaps in our understanding of this aspect regarding elderly at-home care. Furthermore, although the presented efficiency measures provide a novel perspective on service quality,

they have limitations. Higher values of some indicators (e.g., *Quality*) suggest more specialized care but could also be associated with higher costs. These indicators reflect only selected aspects and must be interpreted collectively and in the context of each canton's strategy.

Our findings have implications for policymakers, property stakeholders, and senior housing decision-makers. The insights may help to shape more tailored and efficient approaches for elderly care, ultimately improving their quality of life while at the same time keeping the costs under control. For future research, we suggest conducting qualitative studies further exploring the factors that explain cantonal strategies. Longitudinal studies tracking cantonal strategy changes and their impact on older people's well-being and costs may provide a more comprehensive understanding. Finally, gathering survey data on apartments with associated services designated for older people would enhance the overall knowledge of this type of elderly care, rendering relevant findings for decision-makers at both the cantonal and national levels.

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Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. Population statistics of the Swiss cantons in 2020.

Code	Canton	Population	*Share* 65+
German-speaking region			
AG	Aargau	694,072	18%
AI	Appenzell Innerrhoden	16,293	20%
AR	Appenzell Ausserrhoden	55,309	20%
BE	Bern	1,043,132	21%
BL	Basel-Landschaft	290,969	22%
BS	Basel-Stadt	196,735	20%
GL	Glarus	40,851	21%
GR	Graubünden	200,096	22%
LU	Lucerne	416,347	18%
NW	Nidwalden	43,520	21%
OW	Obwalden	38,108	20%
SG	St. Gallen	514,504	19%
SH	Schaffhausen	83,107	22%
SO	Solothurn	277,462	20%
SZ	Schwyz	162,157	18%
TG	Thurgau	282,909	18%
UR	Uri	36,819	21%
ZG	Zug	128,794	18%
ZH	Zurich	1,553,423	17%

Table A1. *Cont.*

Code	Canton	Population	*Share* 65+
French-speaking region			
FR	Fribourg	325,496	16%
GE	Geneva	506,343	16%
JU	Jura	73,709	21%
NE	Neuchâtel	175,894	19%
VS	Valais	348,503	20%
VD	Vaud	814,762	17%
Italian-speaking region			
TI	Ticino	350,986	23%
CH	Switzerland	8,670,300	19%

Table A2. Ranking of the cantons along selected institutional old-age care and support indicators in 2020.

	Permanent Care		Temporary Care and Support					
	$I^{3}_{\text{inst.}}$		$R(d/n)^{1}_{\text{inst.}}$		$D(d/n)^{1}_{\text{inst.}}$		$P(d/n)^{1}_{\text{inst.}}$	
1	JU	204.2	VD	276.2	BS	65.8	VD	4.3
2	GE	188.3	NE	180.8	VD	49.8	BS	3.5
3	VD	186.8	BS	144.9	SZ	43.2	NE	2.8
4	NE	179.3	ZG	79.2	BL	42.8	VS	2.5
5	TI	160.0	FR	78.6	TI	40.6	TG	1.2
6	VS	145.7	VS	55.1	BE	35.4	FR	1.1
7	FR	126.0	BL	49.5	ZG	35.1	BL	1.0
8	BS	120.1	ZH	46.6	NE	35.1	AR	1.0
9	BE	119.9	AG	40.1	ZH	34.9	ZG	0.9
10	NW	118.3	BE	39.6	AG	34.5	BE	0.8
11	SO	117.0	TG	27.6	SG	32.5	SG	0.8
12	LU	114.3	SG	20.6	VS	32.3	ZH	0.8
13	TG	110.5	TI	19.9	SO	30.7	AG	0.8
14	AG	109.8	AR	18.1	FR	28.9	GR	0.8
15	GR	109.3	SH	13.2	GR	28.6	TI	0.6
16	BL	108.3	GR	12.5	LU	26.6	SZ	0.5
17	OW	104.6	SO	9.7	TG	25.0	SH	0.5
18	ZH	104.2	LU	8.9	AR	24.9	SO	0.2
19	SG	101.1	SZ	3.1	SH	23.2	LU	0.2
20	UR	100.3	GL	2.4	GL	13.0		
21	AI	100.3						
22	AR	100.2						
23	SZ	99.1						
24	ZG	98.5						
25	SH	93.1						
26	GL	88.8						
CH		125.2		61.5		42.4		1.2

Notes: Missing data occurs for several cantons. See Table 1 for the variable definitions.

Notes

[1] Aargau (AG), Appenzell Innerrhoden (AI), Appenzell Ausserrhoden (AR), Bern (BE), Basel-Landschaft (BL), Basel-Stadt (BS), Glarus (GL), Graubünden (GR), Lucerne (LU), Nidwalden (NW), Obwalden (OW), St. Gallen (SG), Schaffhausen (SH), Solothurn (SO), Schwyz (SZ), Thurgau (TG), Uri (UR), Zug (ZG), and Zurich (ZH).

[2] Fribourg (FR), Geneva (GE), Jura (JU), Neuchâtel (NE), Valais (VS), and Vaud (VD).

[3] Cantonal activities for old age include strategy development, financing, offering development, needs planning, mandate allocation, quality assurance, and services provision.

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