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The Wait for Primary Care

- *an analysis of underlying factors behind variety in waiting time for primary care within the region of Västra Götaland, Sweden*

Bachelor thesis in Economics, 15 HP

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Abstract

A frequently debated problem regarding Swedish healthcare is the ineffectiveness of the system and how people in need of care have to wait unjustifiably long time periods in order to get treatment. In 2009, Västra Götaland introduced a care choice reform (*Vårdvalet*), enabling private primary care providers to establish in the health care market and allowing the inhabitants to decide freely among the providers. One of the aims of the reform was to increase availability and lower the waiting time, but there are differences between the areas within Region Västra Götaland regarding how long the patients have to wait for a visit with their primary care provider.

The goal of this study is to investigate the differences in waiting time between the areas in Västra Götaland and investigate factors that may affect the variety in waiting time, focusing on geography, income and proportion of elderly and individuals with a foreign background. This is done by comparing the availability in areas with high concentrations of the demographic attributes. Availability is primarily measured by the waiting time to first appointment with a physician but also the geographical distance to care providers is taken into account.

The study found that geography does not seem to have any noteworthy impact on the availability in Västra Götaland in 2012. Instead, the main reason for differences in availability is due to socioeconomic factors such as income and proportion of population born abroad. For this reason, it is of interest to take these factors into special account when improving the availability in health care services.

Key words: care choice reform, availability, primary health care, waiting time, demography, Västra Götaland, geography, socioeconomic

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1. Introduction

The subject of queuing times has dominated the Swedish health care debate since 1980 (Socialstyrelsen, 2009a) and is, according to studies, the major cause for discontent regarding care (Socialstyrelsen, 2011). According to a report from EU, when investigating waiting time in health care, Sweden places last in Europe (European Commission, 2007) while another study reveals that 25% of the respondents did not consider themselves having sufficient access to health care (SKL, 2007). This is a key reason for the bad reputation that surrounds Swedish primary care and an important underlying motive for the reforms aiming at improving the availability of care (Kruse & Ståhlberg, 2013). It is therefore of interest to investigate to which degree this availability is equal for the population.

The lack of competition in the Swedish health care market is often blamed for the inefficiencies and there have been several reforms that encourage competition and thus the increase of supply. The care choice reform was introduced to Region Västra Götaland (VGR) in October of 2009 (Västra Götalandsregionen, 2011b) as a part of *Law of Choice* (SFS 2008:962). Since then, the number of primary care providers has increased significantly and the availability has improved, at regional level (Västra Götalandsregionen, 2012a). These effects have, however, impacted the areas within VGR to different levels (Myndigheten för vårdanalys, 2014). In order to properly evaluate competition in health care and queues such variety must be considered.

There are several previous studies concerning the care choice reform and availability, both at individual and at regional level. The Swedish Competition Authority issued in 2012 a report *Val av vårdcentral - förutsättningar för kvalitetskonkurrens i vårdvalsystemen* investigating the effects of the reform in VGR. It states that Västra Götaland is the region who has seen the largest increase in primary care provider since the introduction of choice and that availability has increased overall, mainly in urban areas (Konkurrensverket, 2012b). It goes however no further in evaluating the differences on sub regional level.

Earlier in 2014 Swedish Agency for Health and Care Services Analysis (Myndigheten för vårdanalys) released a report examining the different aspects of availability in primary care in Sweden, *Låt den rätte komma in*. This study also states that the physical availability has increased overall but that there is a higher concentration around larger cities as opposed to in rural areas. It furthermore brings up the risks of uneven distribution in different

socioeconomic areas as it has revealed that, in Stockholm, areas with lower income levels has gained less health care resources than the richer areas (Myndigheten för vårdanalys, 2014).

The purpose of this project paper is to investigate potential variety in waiting time in different areas within the region of Västra Götaland. If there are differences, it is important to establish what could be the underlying cause. This is an important aspect in evaluating the effect of competition in health care, and in particular to assess the obstacles in improving availability in care services.

1. *Are there differences in the length of waiting time between the areas in Västra Götaland?*
2. *What are the underlying factors for the variety in waiting time in primary health care?*

2. Method

The main focus of the paper is the waiting time in primary health care and comparing the sub regions of VGR. The sub regions are divided into 12 Health Care Committees (HSN), i.e. administrative units of primary care in the region, and the study begins with establishing whether there are differences in terms of fulfillment of the health care guarantee in these areas. In order to find underlying factors, the thesis first studies potential correlation between the variety in supply and the waiting time, and then goes on to searching for factors in demography and geography. The main method was descriptive and cross-sectional data, complemented with qualitative information from reports and previous studies concerning primary care, availability to care and the care choice reform. By focusing on only one region (VGR) we avoid the risk of including the exogenous factor of payment systems.

This final part of the study focuses on four out of the twelve sub regions in VGR, chosen based on geographical and demographic attributes and on the availability within the health care guarantee. The chosen HSN all differ from each other in different ways and will thereby represent a wide part of the diverse VGR. This study compares four areas; the HSN with the best and worst availability and the HSN located in urban and rural areas with distinctive attributes.

- HSN 2 (Dalsland) is a rural area with a high proportion of elderly and the highest amount of primary care providers per person.
- HSN 4 (Tjörn, Öckerö, Kungälv) has the highest fulfillment level. The area consists of mainland as well as islands.
- HSN 5 (Central-western Gothenburg) represents the inner city with a great daily flow of people. This area contains the most primary care providers in VGR.
- HSN 12 (North-eastern Gothenburg) is of interest due to it having the lowest fulfillment level in VGR while being geographically close to the inner city.

As the analysis covers these four, very distinctive geographical areas in Västra Götaland, the results can to some part be applicable nationally, since Sweden has the same variation as Västra Götaland but to different extent. Many of the geographically positive and negative attributes in Sweden are included in the four chosen HSN, covering rural, urban and suburban areas. This is also the situation for demographic attributes, where the HSN are examples of areas with high concentrations of elderly, people with foreign background and different economic situations.

Due to the great variety in Västra Götaland, the results found in this study can be compared to situations in the remainder of Sweden. The north of Sweden faces similar geographical problems as HSN 2 (Dalsland), where distance is an essential obstacle to high availability. The obstacles are however more significant in the northern part of Sweden, where the distance to larger communities is on average larger than in HSN 2 (Dalsland), making the possible obstacles in visiting care providers even more complicated. HSN 5 (Central-western Gothenburg) can be compared to the inner cities of Stockholm and Malmö, with a great daily flow of people. Similarly, HSN 12 (North-eastern Gothenburg) has got corresponding poorer areas with high levels of unemployment and a high concentration of foreign background in the suburbs to Stockholm and Malmö. These areas are geographically close to the larger cities, theoretically enabling individuals in the poorer areas to seek care outside of their area if they find shorter queuing times.

The external validity of this study is, however, affected by the different types of payment vehicles in the regions in Sweden. This will likely affect the providers' willingness in different regions to locate in areas with high concentration of certain demographic attributes, as some regions might provide higher compensation levels. In addition, one must keep in mind that the extent of the choice reform's breakthrough in VGR is very high, with a great number of provider startups. This is not the case for the whole of Sweden. Additionally, the exact structure of the health care markets differ slightly in the regions in Sweden, due to adaptations to suite the geographical circumstances (Rehnberg, Dahlgren & Goude, 2013).

Additionally, there may be other exogenous factors present than those included in this study, affecting the total availability in an area. One example of this is how the areas have promoted the care choice reform. If there are significant differences, the results may differ due to this.

2.1 Data

The main source of the quantitative data is from the Swedish Association of Local Authorities and Regions' (Sveriges Kommuner och Landsting) www.*vantetider.se*; a webpage created in connection to the care choice reform as a way for the public to get insight in each primary care provider's waiting time. The data is collected two times a year during a two week period and measures how many days patients have had to wait to get in contact and visit care providers, with particular focus on to which degree the wait fulfills the health care guarantee. The remaining quantitative data as well as the qualitative data comes from a number of

reports, the majority being issued by the National Board of Health and Welfare (Socialstyrelsen) and Region of Västra Götaland (Västra Götalandsregionen).

The regular waiting time measurements started as a part of the care choice reform in 2009. Due to this, there are few studies on waiting time in VGR before 2009 and the actual values for 2009 are not reliable, as the newly established primary care providers did not get representable data due of difficulties connected to the starting-up process. The data in this study is primarily from a two week period in October 2012, as the providers who established in 2009 at this point in time are more representable while, at the same time, the providers who were already present before 2009 have integrated the care choice reform into their business. As this study has taken place in spring 2014, some of the required data for 2013 is not compiled yet, making 2012 the most recent but still reliable year to study.

While the purpose of the webpage (vantetider.se) is for patients to get a fair understanding of the waiting time for each provider, there is a risk for bias since the numbers are self-reported. This may be the case in our study, as waiting time is an important variable when choosing provider and long such times can reduce the amount of patients a provider receives, thereby lowering their revenue. In this study we do however assume that the values are in fact correct.

Another assumption in the analysis is that the data sample for the two week period is representative for the providers in the long run. This assumption is supported by the time period being chosen by Swedish Association of Local Authorities and Regions to represent the waiting time in autumn and therefore being of relevance for patients when comparing providers.

Out of the 194 primary health care providers, data is missing for four of the providers for October 2012: one public in HSN 5 (Central-western Gothenburg), one private in HSN 8 (Sjuhärad) and one private respectively public in HSN 10 (Eastern Skaraborg). These were assumed to not be outliers and instead to have results similar to the average for respective HSN.

There is also a wide spread in the actual amount of days spent in queues within the guarantee at different providers, which is not taken into account in this study. Some of the providers have a high availability with only a fraction of the patients waiting more than a few days, while other have the same high availability but with a great part of the patients receiving care within the latter part of the time guarantee.

Queuing time is measured per primary care provider, but as the patients per provider varies, it is of importance to control the values for the weighted queue days in order to be able to exclude possibly imbalanced results. Each provider's queuing time is weighted by the proportion of patients they receive out of the total number of patients in the HSN. The final results were used in calculating the mean values for the HSN, but were however so similar to the unweighted values that there was no noticeable difference between them. The waiting time variable is measured as the fulfillment level of the health care guarantee. The health care guarantee is however not the focus of the study but rather a way of measurement.

2.2 Restriction

This paper focuses only on physical availability in Västra Götaland, in particular waiting time in the form of fulfillment of the health care guarantee. The reason for this is that this aspect is considered one of the most challenging in the Swedish health care model (Socialstyrelsen, 2011). While the guarantee applies both to contacting and visiting primary care, the analysis regards only the guarantee of visiting health care personnel. This is because the variation in waiting time for contact is low; almost all of the contact is done with no waiting time, while visiting might require the patients to wait over a week. Another restriction is that the study is mainly a comparative study of one moment in time (October of 2012), as opposed to a study over time. This is due to a lack of data from before the reform was introduced and thus a lack of appropriate baseline statistics.

Finally, due to lack of small scale data, the study is not able to connect the actual behavior of patients with specific socioeconomic attributes to their behavior in the health care market. Instead, the study investigates areas where the population has a high proportion of individuals with specific socioeconomic attributes.

2.3 Outline

To begin with, the paper starts with an overview of the primary health care system, situation in Västra Götaland and challenges within the health care system in form of waiting time. On the basis of reports and literature, the study discusses what factors could explain different levels of waiting time. To establish whether there is in fact a difference between the different areas of VGR, the levels of fulfillment of the guarantee is compared between the 12 HSN. The results and analysis then go on to find possible explanation for the variation, starting with the level and type of supply in the areas and then by searching for other possible factors that could have a significant effect. For this part, outliers in terms of health care guarantee

fulfillment, geographic circumstances and demographic attributes were chosen to compare what distinguishes the areas.

3. Swedish health care

The Swedish health care system follows a community model where the health care expenditures are collectively funded through taxes and the market is regulated by the *Health Care act* (1982:763). The 20 county councils and regions are responsible for organizing the care and while the production of health care lies at the decentralized level, the National Board of Health and Welfare ensures that the lower levels are following the directions from the government (Kruse & Ståhlberg, 2013). The National Board of Health and Welfare (Socialstyrelsen) is an authority with the mission to make sure that everybody get the needed access to care and welfare and The Swedish Agency for Health and Care Services Analysis (Myndigheten för Vårdanalys) has the task of evaluating health care and social services (Regeringskansliet, 2011).

3.1 Primary care

According to 5§ in the *Health care act*, primary care is "health care that without restrictions towards any sickness, age or patient group, answers for the population's need for basic medical treatment, care, preventative care and rehabilitation and which do not require the medical and technical resources of a hospital" (SFS 1982:763 5§). Even though primary care in Sweden has no gate keeping function, it is often described as the entree door to health care (Sahlgrenska universitetssjukhuset, no date). It is often the first encounter in the chain of open health care and has a purpose of relieving hospitals and emergency departments of pressure. Because of this, primary care is of great importance to the overall performance of the care sector and can be described as the "hub" of the health care system (Västra Götalandsregionen, 2008)

3.2 Health care committees (HSN)

The health care in VGR is geographically and administratively divided into 12 health care committees (HSN), as seen in table 3.1. and fig. 3.1. The committees are in charge of charting the need of health care in the area and to communicate with the population (Västra Götalandsregionen, 2014a).

Table 3.1. The 12 HSN

HSN 1	Northern Bohuslän	**HSN 7**	Partille, Härryda, Mölndal
HSN 2	Dalsland	**HSN 8**	Sjuhärad
HSN 3	Trestad	**HSN 9**	Western Skaraborg
HSN 4	Tjörn, Öckerö, Kungälv	**HSN 10**	Eastern Skaraborg
HSN 5	Central-western Gothenburg	**HSN 11**	Hisingen
HSN 6	Mittenälvsborg	**HSN 12**	North-eastern Gothenburg

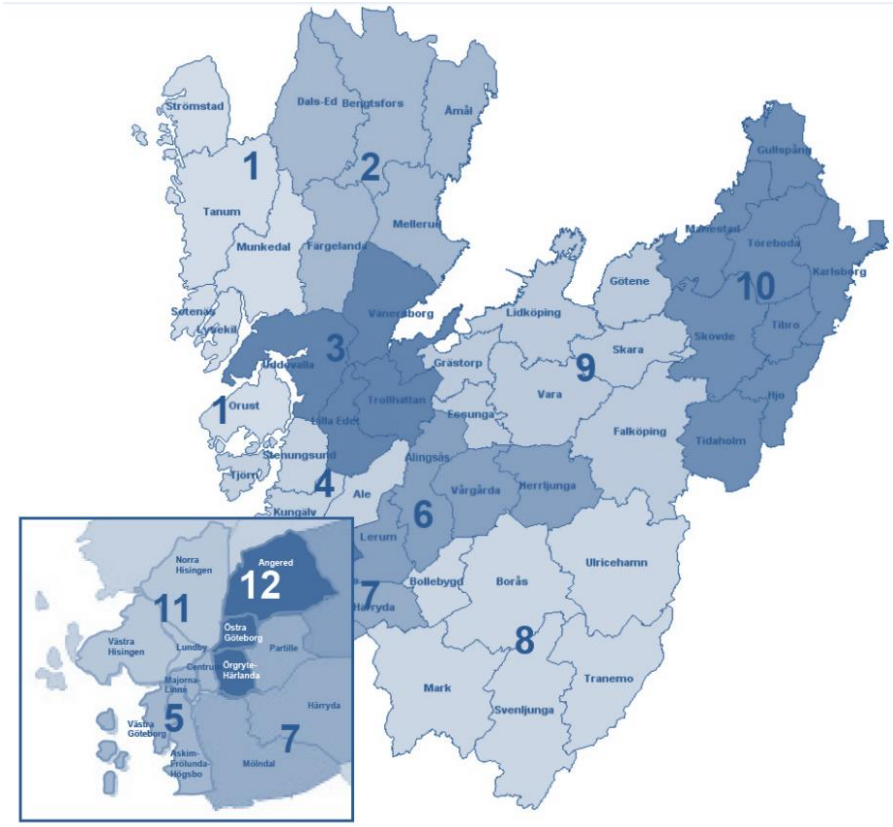


Figure 3.1. The geographical division of VGR into 12 HSN.
Picture: Verksamhetsanalysen 2012 *(Västra Götalandsregionen 2013)*

3.3 Availability in health care

Availability in health care is brought up in the second paragraph of the health care act (SFS 1982:763 2§) and is a term that is multifaceted. It includes the aspect of knowledge and information, trust and legitimacy, finance, and physical availability (Myndigheten för Vårdanalys, 2014). Physical availability in turn includes opening hours, geographical availability as well as waiting time (Socialstyrelsen, 2009a). Waiting time has been the area of greatest problem in Swedish health care and the focus of this paper (Socialstyrelsen, 2011). According to *The manual of Good Care* (Socialstyrelsen, 2006) good health care should be given within a reasonable time.

High availability to health care will likely create more content patients, decrease the administrative costs and improve the quality of the care given (Sahlgrenska universitetssjukhuset, no date). In addition it also takes pressure of the specialized and the emergency care. In order to reach this, several reforms have been created in the attempts of improving the performance, e.g. the care choice reform (Myndigheten för Vårdanalys, 2014).

3.4 Health care guarantee

The health care guarantee is a legislated guarantee (SFS 1982:763 4g§) that gives all patients the right to contact health care personnel and be offered treatment within a certain time period, in each county. The numbers *0-7-90-90* illustrate the number of days that patients should, at maximum, have to wait before reaching the different stages of treatment. A person should be able to get in contact with primary health care the same day as he/she seeks help and able to visit with a health care personnel within a week. If a patient needs specialized care they should be able to visit a specialized care unit within three months and be offered treatment at latest three months after that. If the region is not able to offer the necessary care within these time frames they are required to offer an appointment at another county. The guarantee is, however, only applicable for patients in need of care fairly soon. Less urgent examinations or medical service such as laboratory tests are not covered by this and may therefore have significantly different waiting times (Sveriges Kommuner & Landsting, no date).

3.5 Care choice reform

The care choice reform was introduced in VGR the 1st of September 2009 which gave citizens the possibility to choose primary care provider (Konkurrensverket, 2012b). This is part of the Law of Choice (SFS 2008:962) and is legislated in the health care act (SFS 1982:763 5§). The reform leads to private health care providers being able to enter the health care market subsidized by the government, given that they abide certain regulations stated in the quality book *Krav- och Kvalitetsbok* (Västra Götalandsregionen, 2011). The main aim of the reform was to improve the trust in primary care and strengthen the stance of the citizen; another reason was to ensure sufficient future supply of health care and thereby increasing the availability of primary care (Myndigheten för vårdanalys, 2014).

3.6 Payment in primary care

The most noticeable income for primary care providers is, from the individual's point of view, the visit fee. These do, however, only cover a fraction of the actual cost for treatment. The rest is funded by taxes, using different weighting variables in order to distribute the compensation accurately. VGR has adopted a payment policy where providers receive financial compensation partly as capitation and partly as compensation for certain geographic and demographic attributes (Konkurrensverket, 2012a). The primary care providers will monthly be compensated for high proportions of enlisted patients with potential high need of health care, such as elderly living alone, unemployed or individuals born abroad (table 3.2). If the

average weight per enlisted individual is more than 2.5, the provider will receive a compensation based on the number of enlisted individuals and the average weight for these. A similar weight system is formed for different illnesses, hereafter referred to as the care weight. This is in order to ensure that health care is available for the whole population, regardless of attribute or location (Västra Götalandsregionen, 2011a).

Table 3.2. Socioeconomic factors and their weights per affected individual (Västra Götalandsregionen, 2011a)

Proportion of	Weight
Elderly living alone	6.15
Unemployed	5.13
Born abroad*	5.72
Single parent (child (0-15 years))	4.19
Lower education	3.97
Children < 5 year	3.23
Moves last year	4.19

*born in south and eastern Europe, Asia, Africa or South America

Beside the before mentioned attributes, the providers are also compensated for age and gender, care weight, coverage, quality, socioeconomic factors, geography and the need for translators.

3.7 Primary care in emergency departments

The emergency departments (ED) in VGR are frequently criticized in Swedish media for their long queues for immediate health care (Expressen, 2013; Kennedy, 2014). This is a problem for the society, as the health situation for patients may worsen during the time spent waiting, making treatment more difficult and expensive (DeVon et al, 2010), while the stress from time pressure may decrease the quality of assessment of patients, resulting in patients leaving the ED with a bad experience (Möller, Fridlund and Göransson, 2010). For this reason it is desirable for the society to keep this queue short and the work load for the ED personnel reasonable.

One reason for the long queues is, according to the analytical team at the health and health care department at VGR (Västra Götalandsregionen 2012a), the amount of patients with non-urgent symptoms choosing to visit an ED instead of booking an appointment at their primary care providers. In November 2009, approximately 23% of the total patients visiting four of the ED in VGR were categorized and registered as merely in need of primary care, unevenly distributed from 13 to 39% (Västra Götalandsregionen, 2012a). Roughly 11% of the visitors

at the selected EDs were not included in this registration. The same occurrence is present in the ED specialized in childcare. In the days after Easter in April 2014, there was a sudden surge in visits at Drottning Silvias child and youth hospital, where roughly 30% of the children were not in need of meeting a physician but could be treated by a nurse before being sent home (Kennedy, 2014).

4. Theory

The health care market in Sweden is unlike the markets for other goods, as it is essential for the welfare of the population and is thereby governmentally funded. It is of interest for local politicians to assure that the market is working properly, in order to ensure everyone's wellbeing.

4.1 The health care market

The health care market in Sweden is a quasi-market, meaning that it is publicly governed while still offering private service (Kähkönen, 2004). This results in the government maintaining control of the health care system, while receiving the benefits of a free market, such as services being provided at minimum cost. It differs in many ways from retail markets. Beside the presence of consumers, in this case patients, and providers, there also exists an agent, the physician, who to a great extent decides the type and level of demand for treatment for the consumer. This is also referred to as the payer-producer-patient triangle in health care. Due to the characteristics of the health care market, in particular the asymmetric information, and the major externalities, the sector is highly regulated. This is certainly the case in Sweden where the health care follows a community model (Kruse & Ståhlberg, 2013).

4.2 Disequilibrium in the health care market

The quasi market has in common with monopolies that there is a risk of inefficiency manifesting itself in a market performing at a level that is not equilibrium. Queuing times is an example of this, as it is an imbalance in form of a gap between demanded and supplied quantity of health care. The reason behind the undersupply could be of different characteristics such as logistic, administrative, lack of resources etc. The reason behind high demand could be easy access to care financially, change in demography, new knowledge, among others. While waiting time is not avoidable to a full extent, as this would be extremely expensive, persistently long queues indicate a situation with long periods of under capacity - as in the case of Sweden (Socialstyrelsen, 2011).

There have been reforms directly aimed at shortening health care queues, for example the Health Care guarantee. Researchers have, however, found that this type of policy have more of a short- than long term effect (Sahlgrenska unversitetssjukhuset, no date), since it does not deal with the underlying structural problems. So was also the effect of the Health Care Guarantee; while being an important guarantee for citizens, the largest effect was seen when it was first introduced and since then the effects have subsided (Socialstyrelsen, 2011). The care

choice reform was instead a policy aimed directly at supply with the underlying notion that there were inefficiencies in the supply side of the market (Siciliani & Hurst, 2005).

4.3 Quality competition

While the care choice reform introduced competition in the primary care market it does not allow providers to compete in prices. Instead health care provider must compete with the observable aspects of service, availability and competence and this is called q*uality competition*. Improved quality is an important aim but arguable difficult for people seeking help to have insight about, due to asymmetric information (Konkurrensverket, 2012b). The reasoning behind introducing competition is that more providers would seek the opportunity of entering the undersupplied sector, thus shifting the supply curve. This makes the market approach equilibrium, which consequently would put downward pressure on queues (Myndighet för vårdanalys, 2012).

4.4 Need of health care

Studies have shown that the general health level differ across the population and in effect so does the need for care. The groups that have different need and consumption are mainly distinguished by the socioeconomic conditions, whether they are born abroad and the age of the patient. The need for care is significantly higher for people born outside the Nordic countries, for people over 65 years old and for those with lower income levels. The 2§ in the *Health care act* (1982:763) states that "care should be based on need" indicating that the above mentioned groups are to a higher extent dependent on care, and the availability to care (Socialstyrelsen, 2009b).

4.5 Distribution of health care

The effectiveness of the market-like solution for health care is to a large extent affected by factors regarding primary care and the characteristics of the geographical area e.g. technology, scale effects and the population base. Due to these factors there is a risk of competition being unevenly distributed among different types of areas and it is important to assess the extent of the diversity to make sure that the differences do not hinder the policy of need-based care (Myndigheten för vårdanalys, 2014). If the providers in some way select patients that they suspect have lower care weight, e.g. by choosing a more attractive area, there is a risk of the care being unevenly distributed. This could mean that the groups of patients with the highest need for care live in areas where there is undersupply. This could however be counteracted by financial compensation for establishing in less attractive areas (Myndigheten för vårdanalys, 2012).

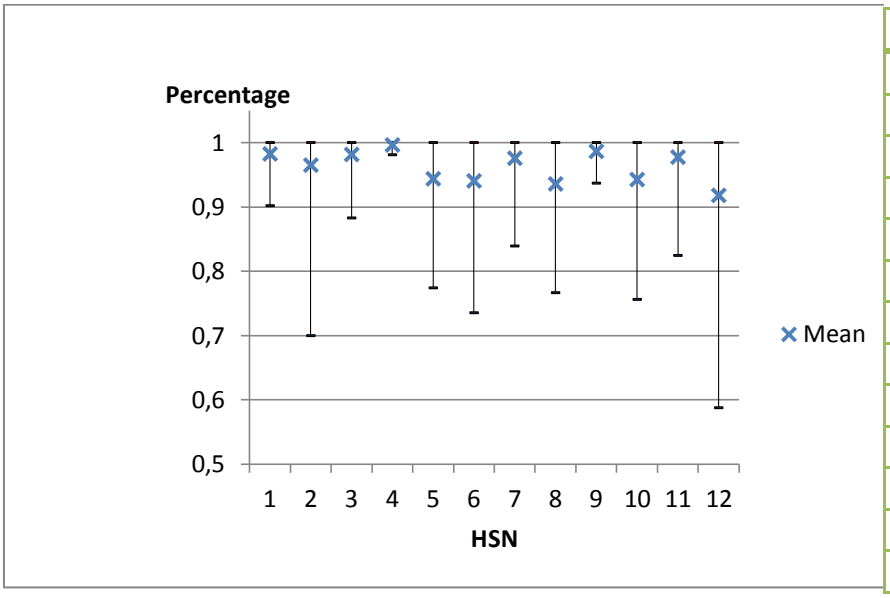
5. Results & Analysis

The 12 HSN all have very high mean levels of health care fulfillment, but the actual availability in the areas differ from each other. For this reason, it is important to investigate the reasons for the inequalities and adjust the care in a way that ensures every citizen a high health care availability.

5.1 Variety in waiting time

The degree of health care fulfillment in getting an appointment with a physician is demonstrated by fig. 5.1. The mean level, as indicated by the cross, is the average fulfillment percentage of the health care providers in each area. The columns for minimum and maximum values show to which extent the providers in an HSN fulfill the guarantee the least respectively the best.

Figure 5.1. Fulfillment of health care in the 12 HSN:



HSN	Mean	Min	Max
1	98.36	90.18	100
2	94.76	69.97	100
3	98.00	88.27	100
4	99.55	98.10	100
5	94.36	77.40	100
6	94.24	73.53	100
7	96.43	83.91	100
8	93.73	76.65	100
9	98.93	93.68	100
10	93.38	75.60	100
11	97.20	82.44	100
12	91.44	58.76	100
VGR	95.83	58.76	100

All areas have providers that reach 100%, but the mean and minimum level vary considerably. The area with the highest mean is HSN 4 (Tjörn, Öckerö, Kungälv), which is the only area with a fulfillment ratio higher than 99%. The lowest mean value is found in HSN 12 (North-eastern Gothenburg), with a value that is almost two percentage units lower than HSN 10 (Eastern Skaraborg), which is the second to lowest. HSN 12 (North-Eastern Gothenburg) also has the lowest minimum point, at below 60%, followed by HSN 2 (Dalsland) at around 70%. This indicates that at least one provider in the area cannot book an appointment within 7 days for 42% respectively 30% of the patients.

The minimum values are of interest as they indicate if there are problems in the availability in the area, but need to be compared to the rest of the values in order to determine whether the problem concerns the whole area or just one provider. When observing HSN 2 (Dalsland) and HSN 12 (North-eastern Gothenburg), it is notable that the rest of the providers in the areas perform significantly better; in HSN 2 (Dalsland) most providers are close to 100%, making the area's performance as a whole very good when disregarding from the outlier. HSN 12 (North-eastern Gothenburg), on the other hand, has a wider spread of values, where the public providers average 92% fulfillment when excluding outliers, making it of interest to study. However, the two outliers in HSN 2 (Dalsland) and HSN 12 (North-eastern Gothenburg) care for 20% respectively 15% of the total visitors in the areas, making them relevant to take into account in the analysis.

By running a regression model, where fulfillment percentage is the dependent variable and each HSN are the independents, it is measurable whether the differences between the HSN are significant. As the variable for HSN consists of nominal data, 12 dummies are created in which one of the areas is stated as 1 and the rest as 0. When running the regression, one of the dummies becomes the base value and the rest are compared to this. The t- and p-value states whether the difference is significant with a 95% confidence interval.

Table 5.1. Regression of fulfillment & HSN

Variable	Beta	T	P
HSN1	0.0645273	2.55	0.12
HSN2	0.0470162	1.69	0.093
HSN3	0.0636398	2.63	0.009
HSN4	0.0784273	3.15	0.002
HSN5	0.0257606	1.18	0.239
HSN6	0.0225356	0.87	0.384
HSN7	0.0577823	2.49	0.014
HSN8	0.0177545	0.78	0.438
HSN9	0.0684427	2.70	0.008
HSN10	0.245585	1.01	0.312
HSN11	0.0595058	2.39	0.018
HSN12	Omitted		
Constant	0.9177727	49.21	0.000
F-value	2.40		
Prob>F	0.0085		

In table 5.1, HSN 12 (North-eastern Gothenburg) is the base variable. All of the beta-coefficients have a positive value, meaning that the rest of the HSN have a higher availability than HSN 12 (North-eastern Gothenburg). The p-values indicate which values are significantly different from HSN 12 (North-eastern Gothenburg): HSN 1 (Northern Bohuslän), HSN 3 (Trestad), HSN 4 (Tjörn, Öckerö, Kungälv), HSN 7 (Partille, Härryda, Mölndal), HSN 9 (Western Skaraborg) and HSN 11 (Hisingen). HSN 4 (Tjörn, Öckerö, Kungälv) has the highest significance level, and will be significant in 99.8% of the time, and the beta value of 7.84 means that the fulfillment level will be 7.84% higher in HSN 4 (Tjörn, Öckerö, Kungälv) compared to in HSN 12 (North-eastern Gothenburg). According to the model, HSN 2 (Dalsland), HSN 5 (Central-western Gothenburg), HSN 6 (Mittenälvsborg), HSN 8 (Sjuhärad) and HSN 10 (Eastern Skaraborg) are not significantly different from HSN 12 (North-eastern Gothenburg). These results indicate that there are significant differences between the HSN with lowest fulfillment levels to some of the remaining HSN.

5.2 Supply of primary care

One of the goals of the reform was to encourage private establisher to invest in the primary health care market. Following is an outline of the number of primary care providers that are in business in each HSN in 2012 and what proportions of them are privately owned.

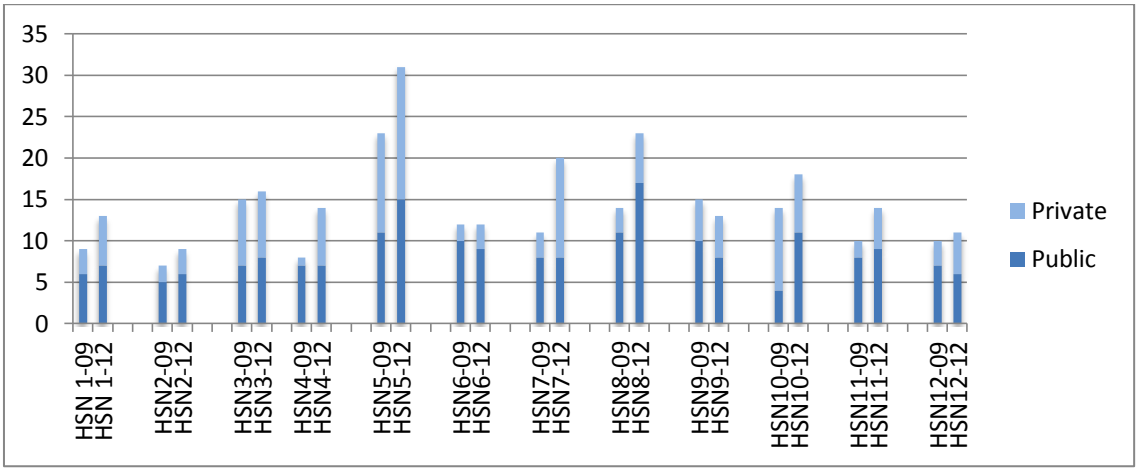
First, HSN 5 (Central-western Gothenburg) has the highest number of providers and the second to largest proportion of private primary care units, while HSN 2 (Dalsland) has the lowest number of providers and the fourth to lowest proportion. The highest proportion of privately owned care providers is found in HSN 7 (Partille, Härryda, Mölndal) while the lowest is found in HSN 6 (Mittenälvsborg).

Table 5.2. Number of primary care providers in 2012:

HSN	Providers	Private	Public	Private (%)
1.	13	6	7	46.15
2	9	3	6	33.33
3	16	8	8	50
4	14	7	7	50
5	31	16	15	54.84
6	12	3	9	25
7	20	12	8	60
8	23	6	17	26.09
9	13	5	8	30.77
10	18	7	11	38.89
11	14	5	9	35.71
12	11	5	6	45.45

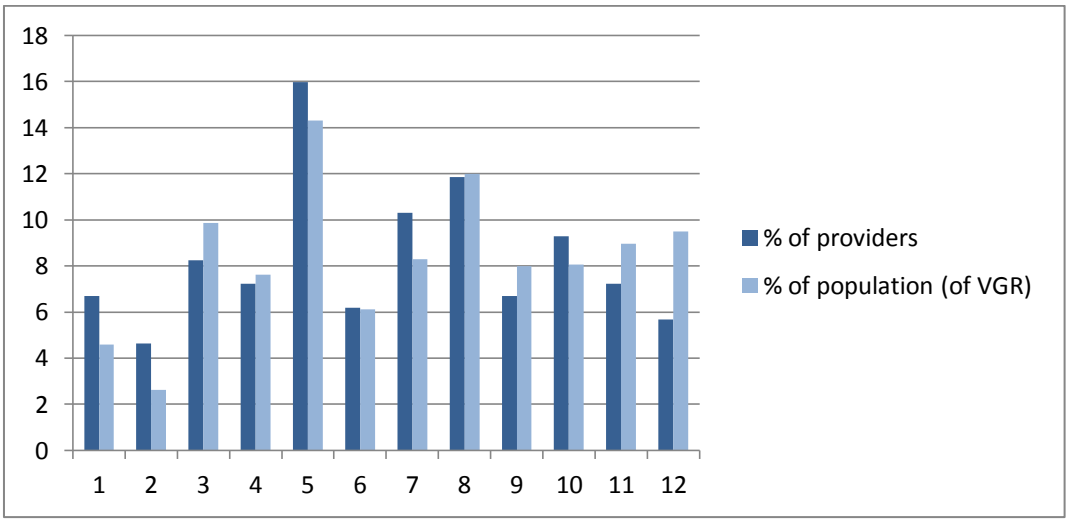
Fig. 5.2. compares the amount of care providers in different areas in the years 2009 and 2012 and their form of ownership. In the fall of 2009 the reform had just been introduced and fig. 5.2. is thus not the basis for a before and after analysis but rather a depiction of how the HSN has responded over time to the newly introduced competition. The graph indicates that there are noticeable differences between the HSN regarding the structure of care providers the years 2009 to 2012. In the majority of HSN the number of providers has increased, especially the private providers, with the most obvious case being HSN 7 (Partille, Härryda, Mölndal). In HSN 6 (Mittenälvsborg) and HSN 9 (Western Skaraborg) the number has however not increased and in HSN 8 (Sjuhärad) and HSN 10 (Eastern Skaraborg) the no. of public providers has increased more than the private (vantetider.se, no date).

Figure 5.2. Number of providers in each HSN: 2009 & 2012(Sveriges kommuner och landsting, 2009)



The differences in supply could partly be explained by the difference in population in each area. There are for example 229 000 people living in HSN 5 (Central-western Gothenburg) while only 42 000 reside in HSN 2 (Dalsland) (Statistiska Centralbyrån, 2014). Fig. 5.2. compares the percentage of care providers compared to the proportion of people in VGR living in the same area. It reveals that in a few of the HSN, the number of providers is proportional to the population. In HSN 1 (Northern Bohuslän), HSN 2 (Dalsland), HSN 5 (Central-western Gothenburg), HSN 7 (Partille, Härryda, Mölndal) and HSN 10 (Eastern Skaraborg) there is overrepresentation of primary care units while there is underrepresentation in HSN 3 (Trestad), HSN 9 (Western Skaraborg), HSN 11 (Hisingen) and 12 (North-western Gothenburg). The highest level of overrepresentation is found in HSN 2 (Dalsland) and the greatest level of underrepresentation in HSN 12 (North-eastern Gothenburg).

Figure 5.3. Percentage of total providers respectively percentage of population in each HSN.



The Herfinahl-Hirshman Index (HHI) is a measurement of market concentration and is calculated by summing the squares of each competitor's share of the market. The result is a value between 0 and 1, where 0 indicates a perfectly competitive market and 1 a monopoly (Rhoades, 1993).

$$H = \sum_{i=1}^{N} MS_i^2$$

i = no. of producers
MS = market share

When using the HHI in the health care market, the market share is for example the number of visits per provider as a share of the HSN. Choosing the HSN as the market could be more appropriate than the entire region as it could be somewhat unrealistic for a patient to travel to another part of VGR (Myndighet för vårdanalys, 2014). The results are presented in table 5.3.

To clarify, this index does not measure the level of competition in terms of ownership, but rather how evenly distributed the number of visitors are between the providers. The lowest value is in HSN 5 (Central-western Gothenburg) and the highest in HSN 2 (Dalsland). All values are fairly low, indicating that there are few providers with high market share in any of the areas.

Table 5.3. HHI per HSN

HSN	HHI
1	0.0853
2	0.1400
3	0.0710
4	0.0918
5	0.0392
6	0.1067
7	0.0665
8	0.0557
9	0.1067
10	0.0811
11	0.0790
12	0.1185

As the level of supply of primary health care varies between the HSN there is the possibility that this explains the variety in fulfillment levels. By checking the HSN that are under/overrepresented in terms of primary care (figure 5.3.) and comparing to the respective levels of guarantee fulfillment, no conclusive relationship is obvious. The HSN with lowest fulfillment, HSN 12 (North-eastern Gothenburg), is also the area with the least number of providers per person but the HSN with the most overrepresentation, HSN 2 (Dalsland), does not have the highest fulfillment levels. There is no positive connection between

overrepresentation and fulfillment of the health care guarantee, as e.g. HSN 7 (Partille, Härryda, Mölndal) has a lower fulfillment level than HSN 3 (Trestad).

The share of private providers also differs between the HSN and could be connected to the waiting time. According to table 5.2, the HSN with highest proportion is HSN 7 (Partille, Härryda, Mölndal) with 60%, followed by HSN 5 (Central-western Gothenburg) with 54.84%. Regarding guarantee fulfillment, these HSN are not part of the areas showing the highest fulfillment levels. When taking a closer look at how the individual private providers perform compared to the public providers the average fulfillment level is 97.47% while the public 94.70%. This difference is however mostly due to HSN 12 (North-eastern Gothenburg) where the public provider's low levels drag down the average.

When performing a regression model where fulfillment percentage is dependent on the dummy *private*, the beta-coefficient of 0.0207 indicates that the private suppliers will have 2.07 percentage units better fulfillment. The variable for total visits is also included to account for scale effects, as private providers have 9.2 percentage units fewer visitors than the public providers (as of October 2012, [Sveriges Kommuner & Landsting, 2014]). This variable does however prove to be clearly insignificant. While the beta-coefficient for ownership is statistically significant the R^2 value shows that the model only explains 2.91% of the variety.

Table 5.4. Regression with fulfillment of guarantee dependent on ownership

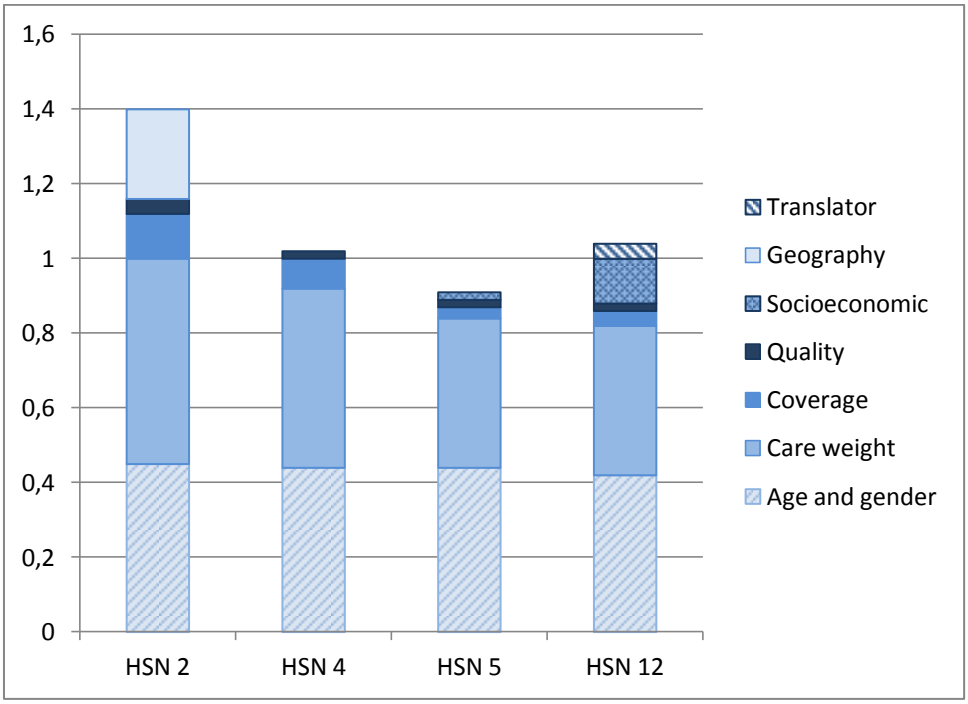
Variable	***Beta-coefficient***	***t***	***p***
Private	0.0207	2.21	0.029
Total visits	-0.000	-0.70	0.487
Constant	0.9579	85.39	0.000
F-value	2.80		
Prob>F	0.0632		
R2	0.0291		

5.3 Geographic and Demographic Aspects

When investigating the reasons for the differences between the HSN, there are two important aspects that need to be investigated: the geographic and the demographic. The factors included in this study are chosen based on those for which special compensation is given to each primary care provider, as mentioned in 3.6. The attributes of importance are the geographical distance to the primary care unit, type of geographical area, median income and the proportion of the population who are elderly, have a foreign background or low income. Additionally, the difficulties arising in language barriers, physical barriers for elderly and the treatments for unemployed or immigrants are discussed.

The main focus lies on the four HSN with either low or high fulfillment levels, i.e. HSN 12 (North-eastern Gothenburg) and HSN 4 (Tjörn, Öckerö, Kungälv), or with interesting geographic features. HSN 5 (Central-western Gothenburg) is of great interest to study as it represents the inner city with a high density of population and high levels of activity in the area. HSN 2 (Dalsland) is the opposite area geographically, being the most sparsely populated area in the selection.

Figure 5.4. Approximate cost for HSN during 2010 (Västra Götalandsregionen, 2011a)



The costs within VGR are greatly diverse, due to the different attributes of each HSN and their population. Fig. 5.4. shows the average cost for health care per person compared to the average for VGR, which in the graph is denoted as 1.0. The attributes are then distributed within each column according to the compensation each HSN receives for the specific attribute, compared to the total compensation (Västra Götalandsregionen, 2011a).

Due to the risk of underrepresentation of primary care in rural areas, a part of the compensation is a geographical compensation. The geographical factors are measured in form of number of people per municipality, spread of people in the area and distance to closest provider, as well as a water factor. These are calculated together and if the sum is above a certain level the provider receives financial compensation (Västra Götalandsregionen, 2011a).

5.3.1 Geographic

"Västra Götaland is like a miniature Sweden – large cities and countryside, small communities and average sized towns. The nature alternates between coast side to forest with lowland and pastures" - *Fakta Västra Götaland* (2014)

The region of Västra Götaland have an area of 23797 km^2, making it one of the largest in Sweden and it consists of a versatile landscape. Between the 49 municipalities there are large cities, in particular Gothenburg, to small communities in Dalsland surrounded by forest to the 150 inhabited islands, many only commutable by boat. The Swedish Agency for Economic and Regional Growth (Tillväxtverket) has created a measurement for availability for services where areas are divided into five categories: very high availability (cities with over 60 000 citizens), *high* availability (cities with 30 000 – 60 000 inhabitants), *medium* (cities with 3 000 – 30 000 inhabitants), *low* (no cities with more than 3 000 inhabitants) and *very low* (no cities with more than 1000 inhabitants). The areas of VGR fall into one of the three first mentioned categories (Tillväxtverket, 2010).

Central Gothenburg is the only area in the region which falls under the category *very high* availability, with 526 000 residents and approximately 1 000 inhabitants/km^2 (the average for Västra Götaland being 67 inhabitants/km^2). When observing figure 5.3 it is noticeable that HSN 5 (Central-western Gothenburg), is overrepresented compared to the region as a whole. Nonetheless, this area is not a frontrunner in fulfillment of the health care guarantee but fall in the middle of the results for VGR, as noted in fig. 5.1.

On the contrary to HSN 5 there is HSN 2 (Dalsland), where the density in population is 13.3 inhabitants/km^2 (SCB, 2012) and the majority of the landscape consists of nature. Although it is the area with the least inhabitants per provider (4662), i.e. what could be considered a desirable value from the patient's point of view, it does not fairly represent the geographical availability in the area. In the 3715 km^2, there are a total of 9 primary care providers, making the average travelling distance longer than in the other areas. This means that even though each provider has fewer patients to care of compared to the providers in the rest of Västra Götaland, the patients are geographically limited when choosing care providers. Since the start of the care choice reform, the number of providers has only increased by three (Sveriges kommuner och landsting, 2009), but as the population is scattered over such a large area, only few have been able to enjoy the increase in providers.

Another area of interest is HSN 4 (Tjörn, Öckerö, Kungälv), consisting of mainland as well as islands. Despite the variety in landscape, there is a high availability in the area, with no provider having less than 98% availability. This may be due to the fact that two out of three inhabitants in this HSN live in urban areas, making it easier for providers to establish in locations so that a large part of the population is geographically close to at least one provider, and they receive no geographical compensation.

Table 5.5. The amount of inhabitants per provider in 2012 (SCB 2012)

	HSN 2	**HSN 4**	**HSN 5**	**HSN 12**	**VGR**
Inhabitants per provider	4 662	8 713	7 389	13 818	8 250

The geographical characteristics are highlighted by the fact that HSN 2 (Dalsland) is the area that receives the most geographical compensation, which covers about 17% of the costs for primary health care. Thus, in terms of geographical availability, this area would likely face most challenges and could partly explain the low guarantee fulfillment of the provider with the outlier value, as the low number of patients and long distances results in providers only hiring a small number of physicians. This means that each physician's presence is of greater importance and availability might be considerably affected in case of illnesses or change in employees, as it is difficult for the provider to quickly find a substitute who is willing to work in an area that is likely out of pending distance from the physician's home. Except for this outlier provider, HSN 2 (Dalsland) has a good fulfillment level despite of these geographical obstacles.

The relationship between waiting time in health care and geography concerns the practicality of receiving care due to travel time and costs. For patients in rural areas, long travel distance to health care providers might restrict patients from visiting a health care center unless it is critical, as the travel time might result in absence from work or requiring someone else to take care of the family for the day (Socialstyrelsen, 2009a). There is also a lower number of primary care providers in the sparsely populated areas, i.e. HSN 2 (Dalsland), creating further distance between patient and health care, compared to in more urban areas.

5.3.2 Demographic

Beside geographic conditions, availability may be affected by several demographic attributes. Particularly the proportion of elderly, foreign background and income are of interest. For Västra Götaland as a whole, the population earns 206 500 SEK per year per person, 18% are older than 65 years old and 19% have a foreign background.

Table 5.6. Facts about HSN 2,4,5 and 12 (Västra Götalandsregionen, 2010):

	Elderly (%)	Median income	Low income (%)	Born abroad (%)
HSN 2	25	197 700*	N/A	9*
HSN 4	18	226 400	14	11
HSN 5	16	209 200	24	19
HSN 12	13	174 500	32	45
VGR	18	206 500	20	19

*SCB (2012). Data for 2010 not available.

Elderly: proportion of the population 65 years and older.

Median income: the median income level for inhabitants aged 20-64 for each HSN, with the exception of HSN 2 which, due to lack of data, is the average of the median income for inhabitants aged 18-64 in the five municipalities Bengtsfors, Dals-Ed, Färgelanda, Mellerud and Åmål.

Low income: the proportion of the inhabitants annually earning less than 106 156 SEK.

Foreign background: the proportion of the population born outside of Sweden or with both parents born abroad. HSN 2 shows only for those born abroad.

The density of elderly in the population in an area is important to take into account, as elderly tend to more often get severely ill than younger individuals. The health care looks different for this part of the population, with a greater focus on long-term health care and follow-ups (Åkesson et al., 2005). This indicates that continuity is of special importance for this group, as the illnesses and health records are longer and often more complicated than for other groups. An assigned physician would make the procedure more efficient as the physician is familiar with the patient and the records, while the patient is spared the stress of explaining their health situation at the beginning of each meeting, which might not even be fully understandable to the patient (Åkesson et al., 2005).

As the health care is more extensive for this age group, it also suggests that the care is generally more expensive in areas with high concentrations of elderly. This is also supported by the high care weight for caring for elderly who are living alone, as seen in table 3.2. When comparing the four HSN in our study, HSN 2 (Dalsland) has the highest proportion of elderly, 25% compared to 18% in the region and only 13% in HSN 12 (North-eastern Gothenburg).

When comparing the age and gender compensation, there is barely any difference between the HSN. The compensation for age and gender is about 45% of the total cost of health care per person in VGR for all four HSN. This can be explained by the fact that providers also are compensated for very young children and for parents to children younger than 15 years old, which to a great extent even out the compensation regardless of the actual composition of age groups.

However, there is a great difference in care weight, i.e. the compensation for expensive treatments. In this category, HSN 2 (Dalsland) has the highest cost, about 55% of the total cost per person in VGR, while HSN 12 (North-eastern) only has 40%. Considering HSN 2 (Dalsland) consists of almost double the proportion of elderly than HSN 12 (North-eastern), it strengthens the claim that areas with a high proportion of elderly require more extensive and expensive treatment.

As extensive treatments require several health care visits (Tillväxtverket, 2012), this is a relatively stable market for primary health care providers. A patient will usually prefer visiting the same provider once the treatment is started (Åkesson et al., 2005), resulting in providers in areas with a high proportion of patients requiring extensive treatment have a more predictable demand for treatment. This will ease the task of predicting the need of medical personnel per day and the providers are thereby more capable of predicting the appropriate amount of treatment every day, improving availability for the patients while avoiding unnecessary personnel costs.

5.3.3 Income

Income is included as it is of interest to study whether the level of income affects how primary care providers are located, if the income for an area affects the consumption of care and how richer areas behave when choosing which care institute to visit when ill.

Low income or unemployment can be a cause of stress, which in turn can cause other health issues. The risk of developing unhealthy drinking habits is also greater for individuals with low income, making it an attribute of the population with possibly high care weight. Long term under-stimulation sprung from unemployment might also lead to mental problems (Socialstyrelsen, 2009b), worsening the possibilities of creating a more stable economic situation for the individual. Both situations are cases where a quick diagnose and start of treatment is desirable, as the problems grow harder to treat as time passes (Socialstyrelsen, 2003).

Beside differences in illnesses, high levels of poverty and unemployment are often related to higher crime rates (Raphael and Winter-Ebmer, 2001). This attribute will often worsen itself, as people who can afford to live in more secure areas will move away, lowering the housing prices and resulting in only people who cannot afford to live elsewhere moving there. This might also lead to the area becoming an unattractive workplace, leading to firms not wanting

to establish in those areas due to risk of crime (Raphael and Winter-Ebmer, 2001) or difficulties in employing competent personnel while maintaining low employee turnover.

Out of the four sub regions, HSN 12 (North-eastern Gothenburg) has the lowest median income as well as the highest rate of unemployment (32%) out of the whole VGR. This HSN also has the most people listed per primary care provider and the lowest guarantee fulfillment. The low fulfillment levels are mostly due to the public providers in the area having very low levels while the private providers actually have high availability, with 98.9% of the patients receiving treatment within 7 days in this particular HSN.

5.3.4 Foreign background

Foreign background is a variable of interest as these individuals may have other experiences and expectations of the health care system and its procedures than those born in Sweden or with at least one Swedish parent. Individuals who are brought up with Swedish relatives have often been taught the ways of the Swedish health care system and which health care institute to contact in different situations, which will quicken the treatment process. Individuals born abroad or with foreign parents might, on the other hand, have different opinions on what health is (Gåfvels and Wändells, 2007), different expectations of health care providers (Eide and Eide, 2009) and are, to a greater extent, uncertain of the way the health care system works in Sweden.

Individuals from different cultures may often base their understanding of new systems on their own culture (Harmsen et al, 2008), which can complicate the communication between the patient with foreign background and the informer. This might cause misunderstandings, unnecessary queuing at different care providers and fear of contacting care providers due to risk of being treated in ways uncomfortable to the foreign patient due to cultural differences (Simpson & Carter, 2008).

Immigrants from outside of EU have been reported having a worse health than Swedes in general (Socialstyrelsen 2007), making foreign background a potentially heavy care weight factor from the provider's point of view. There might also arise unexpected problems due to cultural differences, e.g. in treatment methods or trust in physicians in primary health care centers (Simpson & Carter 2008). Another possible difficulty which can complicate the availability in an area is language: to individuals who are not comfortable with the Swedish language, it is difficult to explain illnesses and problems (Simpson & Carter, 2008) and may

need a translator present during the visit. Care providers have also at times found the communication issues troublesome (Pergert, Ekblad, Enskär och Björk 2008), which may prevent providers from establishing in areas with high proportions of people with foreign background.

Out of the four areas, HSN 2 (Dalsland), HSN 4 (Tjörn, Öckerö, Kungälv) and 5 (Central-western Gothenburg) have lower or the same proportion of people with a foreign background, (table 5.6), compared to the mean value of 19% for VGR. HSN 12 (North-eastern Gothenburg) is, on the other hand, very special due to the high rate of individuals categorized as having a foreign background - 45% of the population. This is also reflected in the fact that HSN 12 (North-eastern Gothenburg) is the only one out of the four in which primary care providers receive compensation for translators (figure 5.4).

6. Discussion

The main results of this study are that there are significant differences between the areas within VGR in terms of waiting time. The most surprising part of the results are the factors that do not seem to have an impact: the level of supply and geographic conditions. Areas with shorter distances to providers and higher supply of health care, in forms of number of providers, performed poorer than those with longer distances and fewer providers per inhabitant. These findings are important in the sense that it highlights a problem in fulfilling equality in care. While there are several comparative studies of regions, these results emphasize the importance in observing the variety within each region.

While the amount of providers is often brought up as an important factor behind availability, it does not seem to explain the variety in waiting time. The area with the highest fulfillment level, HSN 4 (Tjörn, Öckerö, Kungälv), does not have the highest ratio of provider to population, while the area with the lowest fulfillment level, HSN 12 (North-eastern Gothenburg), do have the lowest ratio. This indicates that while there is no clear correlation between number of providers and waiting time, there seems to be a connection between low performance and under provision of primary care. This could mean that increasing the number of providers can make primary care more effective, but that there is an optimal level of persons per provider before reaching a bottleneck. Moving past this level diminishes the positive effect.

There is the possibility that the increased supply has been followed by increasing demand, which is the general case for VGR according to *Låt den rätte komma in* (2014), and thus that undersupply may have been maintained despite the increase in providers. Whether this is the case and if the demand is positive in the sense of needed medical intention or the costly in the sense of overconsumption, is not covered in this study.

A factor, connected to supply, that do have an effect on the fulfillment level is the type of ownership. A regression model shows that private care units have a higher fulfillment level; the model does however only explain 2.91% of the variety. The reason behind this could either be the private being more effective or that they choose to establish in areas considered more attractive from the provider's point of view. When comparing HSN 4 (Tjörn, Öckerö, Kungälv) to HSN 12 (North-eastern Gothenburg), the share of private providers is 10 percentage units higher in the former. It is also of interest to note that within HSN 12 (North-eastern Gothenburg), a majority of patients use the public option despite the waiting time

being considerably longer than in the private alternative. One reason for this could be unawareness in the society: as a large part of the inhabitants in this HSN have a foreign background, it is possible that some of these inhabitants are not aware of their option to be treated at private clinics in the same way as in the public clinics.

The result in this study gives a clear indication of geographical factors not being a decisive factor behind waiting time. While one might suspect that actual barriers in form of geographical distance would impact on how soon people seek care, this does not seem to be the case. One explanation for this is that the data used in the analysis does not include patients who did not want an appointment suggested within the guarantee time, as they in this case opted out on the health care guarantee. As such, there is no correlation between favorable geographical conditions and high fulfillment levels, highlighted by the fact that HSN 5 (Central-western Gothenburg), with a large possible cliental and easy access to personnel, has lower levels of availability than HSN 2 (Dalsland), with long distances to as well patients as extra personnel. Based on this, the geographic conditions do not seem to be a vital component for high availability when comparing highly desirable and mediocre geographical conditions. There is a possibility that geography earlier had a negative impact on availability in rural areas, but that this is no longer the case in 2012.

HSN 12 (North-eastern Gothenburg), on the other hand, has a lower fulfillment levels despite having short geographical distance to neighboring areas with high availability. This suggests that patients are relatively immobile when ill. Another alternative is if the inhabitants in the area are not aware of their rights to choose freely from all providers, as mentioned earlier.

Demographics conditions seem to be the factor with the most effect on fulfillment levels. The best performing area, HSN 4 (Tjörn, Öckerö, Kungälv), has the highest average income in VGR and the lowest performing area, HSN 12 (North-eastern Gothenburg), has the lowest median income. A possible explanation for this is that there has been found to be negative correlation between general health and income level (Toivonen, 2007), indicating that areas with lower levels have a higher demand for care. Another factor that distinguishes HSN 12 (North-eastern Gothenburg) from other areas is the high share of population born abroad. The exceptionally low fulfillment levels in this HSN's public primary care providers while private providers experience very high levels might be partially explained by this. In general, private health care is considered exclusive and expensive. For an individual who is not fluent in Swedish or fully aware of how the health care system works, there might be a

misunderstanding about cost for visiting a private provider being more expensive than at a public provider.

A final possibility is that patients in areas with a higher income level seek care at specialists, instead of going by the primary care. This has been the case in Stockholm, where primary care providers in areas with a higher income level have been relieved of the care burden as a result of this (Nyman, 2008), creating an unrepresentative result in availability.

The proportion of elderly may be a factor affecting the location of new establishments, but it is unclear to what degree. As elderly tend to be in increasingly higher need of health care (Tillväxtverket, 2012), the care weight for this age group is high, resulting in expensive treatments and multiple visits. This is a favorable factor, as the providers attain a less fluctuating group of patients due to elderly needing more regular follow-up appointments. With a stable amount of patients, it is easier for the providers to plan the daily need of personnel in order to maintain a high level of availability and patient satisfaction. This could, combined with the geographical restrictions, be part of the reason to the high availability in HSN 2 (Dalsland).

Easier and quicker access to primary care might lead to less primary care cases being treated in the ED. This could consequently lead to shorter queues for immediate care, aiding in ensuring that those in need of immediate care receive it when needed. A lighter workload will also aid in preventing the ED personnel from getting stress-related illnesses from work, as a result of a too heavy workload (Socialstyrelsen, 2009b).

Based on this study, there are some actions that can be taken in order to improve the availability regarding waiting time. One important aspect would be to make sure that people in general are aware of the health care choice and, in particular, to ensure that individuals who are having difficulties in understanding Swedish are aware of their options regarding primary health care providers. If there is a continuous difference in availability between private and public providers in areas with high concentrations of inhabitants with foreign background, it is of the interest of the region to investigate what are the underlying factors.

Another action that may be necessary is investigate whether private providers tend to establish themselves in areas where patients are considered more desirable, making the public providers responsible of areas with more difficult groups of patients. Selection as such will counteract the mission of improving health care through competition and will instead create uneven

supply of primary care. If this is the case, it may be of interest to consider encouraging areas in which it would be desirable if more providers would establish themselves, thereby ensuring the right to equally good care in the whole VGR. On example of this could be to reinvestigate the compensation levels to find a level where the socioeconomic less attractive areas become attractive from the providers point of view.

The investigated HSN differ in many aspects, with combinations of differently desirable attributes from a provider's point of view, making it difficult to specify the explicit effect of one demographic attribute. For this reason, the effect of low income and a high level of inhabitants with foreign background are difficult to separate from each other, as there is no area in our selection with only one of the attributes.

It is also of importance to take other aspects into consideration when evaluating health care than to which extent providers fulfill the health care guarantee. The number of queue days, quality of the care and reception at the health care provider might have a decisive role when deciding on provider, making actual guarantee fulfillment of less importance. Only focusing on numerical values creates uneven results where qualitative values are neglected. Not taking these into account when deciding on regional reforms may lead to degraded working environment for health care personnel and lower quality in care, which will have negative long term effects for the society (Kruse and Ståhlberg 2013).

With this paper as an overview of the availability in areas with high concentrations of some population attributes, there are possible future studies that could go further in investigating the aspect that this thesis has revealed.

Suggestions for future studies:

- How has demand for health care changed for different socioeconomic groups after the health care choice reform?
- How has waiting time changed in areas with high concentrations of different socioeconomic groups?
- Is the current level of payment compensation for socioeconomic attributes the optimal level?
- What is the cost for society when the emergency department's resources are used for primary care?

7. Conclusion

The main finding of this project paper is that there are differences between the areas in VGR regarding waiting time. According to our study, the demographic factors are likely the main reasons for the free market not establishing equal availability, while geographic factors to a lesser degree are barriers. The areas being kept waiting longer are also those with lower median income and with a higher proportion of population with foreign background. According to studies, these demographic groups face a higher need for healthcare, making the inequality even more consequential. These results are important to consider when evaluating the performance of the health care market and the health care choice reform.

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Appendix: Data of health care guarantee fulfillment for each provider in VGR

Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN
Bohuspraktiken	1	1	247	247	0	1	0,0828025	2983	0,061595	0,0458	0,9822996	5632,385	0,461538462
Carema VC Orust	1	1	405	397	8	0,980247	0,1357694	2983					
Kvarterskliniken Tanum	1	1	173	172	1	0,99422	0,0579953	2983					
Lysekils Läkarhus	1	1	193	193	0	1	0,0647	2983					
NH Brastad VC	1	0	110	104	6	0,945455	0,0368756	2983					
NH Fjällbacka VC	1	0	137	136	1	0,992701	0,0459269	2983					
NH Kungshamn VC	1	0	211	205	6	0,971564	0,0707342	2983					
NH Lysekil VC	1	0	224	202	22	0,901786	0,0750922	2983					
NH Munkedal VC	1	0	311	306	5	0,983923	0,1042575	2983					
NH Strömstad VC	1	0	221	221	0	1	0,0740865	2983					
NH Tanumshede VC	1	0	218	218	0	1	0,0730808	2983					
Sotenäs VC i Hunnebostrand	1	1	321	321	0	1	0,1076098	2983					
VC Bohuslinden-Strömstad	1	1	212	212	0	1	0,0710694	2983					
Balderkliniken, Åmål	2	1	182	182	0	1	0,0935252	1946					
Medpro Clinic Brålanda VC	2	1	122	122	0	1	0,0626927	1946	0,040183	0,0262	0,9647866	4662,111	0,333333333
Medpro Clinic Lilla Edet VC	2	1	429	429	0	1	0,2204522	1946					
NH Bengtsfors VC	2	0	229	229	0	1	0,1176773	1946					
NH Bäckefors VC	2	0	54	54	0	1	0,0277492	1946					
NH Dals-Ed VC	2	0	129	129	0	1	0,0662898	1946					
NH Färgelanda VC	2	0	177	177	0	1	0,0909558	1946					
NH Mellerud VC	2	0	301	296	5	0,983389	0,1546763	1946					
NH Åmål VC	2	0	323	226	97	0,69969	0,1659815	1946					
Achima Care trollhättans VC	3	1	133	131	2	0,984962	0,0313531	4242					

VC= Vårdcentral
NH= Närhälsan

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Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN	
Achima Care Uddevalla VC	3	1	178	178	0	1	0,0419613	4242						
Maria Alberts VC	3	1	504	504	0	1	0,1188119	4242						
Medpro Clinic Stavre VC	3	1	362	362	0	1	0,0853371	4242	0,087592	0,0986	0,9814066	9864,188		0,5
Medpro Clinic Torpa VC	3	1	235	235	0	1	0,0553984	4242						
NH Dagson VC	3	0	311	311	0	1	0,0733145	4242						
NH Dalaberg VC	3	0	160	160	0	1	0,0377181	4242						
NH Granngården VC	3	0	358	316	42	0,882682	0,0843942	4242						
NH Herrestad VC	3	0	205	197	8	0,960976	0,0483263	4242						
NH Källstorp VC	3	0	416	408	8	0,980769	0,0980669	4242						
NH Ljungskile VC	3	0	234	226	8	0,965812	0,0551627	4242						
NH Vargön VC	3	0	209	201	8	0,961722	0,0492692	4242						
NH Vänerparken VC	3	0	263	255	8	0,969582	0,0619991	4242						
Primapraktiken Trollhättan	3	1	184	184	0	1	0,0433758	4242						
VC Nordstan, Vänersborg	3	1	250	249	1	0,996	0,0589345	4242						
VC Silentzvägen Uddevalla	3	1	240	240	0	1	0,0565771	4242						
Adina Hälsans VC Nol	4	1	313	313	0	1	0,0698037	4484						
Almö Läkarhus	4	1	141	140	1	0,992908	0,0314451	4484						
Backa Läkarhusgruppen Stenungsund	4	1	354	352	2	0,99435	0,0789474	4484						
Centrumpraktiken, Kungälv	4	1	575	571	4	0,993043	0,1282337	4484						
Hönö VC	4	1	138	138	0	1	0,0307761	4484						

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Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN	
NH Nordmanna VC	4	0	134	134	0	1	0,029884	4484						
NH Solgärde VC	4	0	270	270	0	1	0,0602141	4484	0,092589	0,0762	0,9962	8712,571		0,5
NH Stenungsund VC	4	0	473	464	9	0,980973	0,1054862	4484						
NH Stora Höga VC	4	0	212	212	0	1	0,0472792	4484						
NH Tjörn VC	4	0	546	546	0	1	0,1217663	4484						
NH Älvängen VC	4	0	177	175	2	0,988701	0,0394737	4484						
NH Öckerö VC	4	0	135	135	0	1	0,030107	4484						
Nödinge VC	4	1	386	386	0	1	0,0860839	4484						
VC Kusten, Ytterby	4	1	630	628	2	0,996825	0,1404996	4484						
Allemanshälsans VC, Landala	5	1	202	202	0	1	0,0257522	7844						
Allemanshälsans VC, Västra Frölunda	5	1	246	246	0	1	0,0313616	7844						
Capio Citykliniken Gårda	5	1	179	162	17	0,905028	0,02282	7844						
Capio Citykliniken Lundby sjukhus	5	1	193	180	13	0,932642	0,0246048	7844						
Capio VC Axess, Haga-Annedal	5	1	307	238	69	0,775244	0,0391382	7844						
Citysjukhuset +7	5	1	248	241	7	0,971774	0,0316165	7844						
Din Klinik	5	1	143	142	1	0,993007	0,0182305	7844						
Järnhälsan, Göteborg	5	1	110	108	2	0,981818	0,0140235	7844						
Kungsportsläkarna	5	1	186	186	0	1	0,0237124	7844						
Kvarterskliniken Husaren	5	1	155	138	17	0,890323	0,0197603	7844						
Kvarterskliniken Lorensberg	5	1	142	126	16	0,887324	0,018103	7844						
NH Askim VC	5	0	134	134	0	1	0,0170831	7844						
NH Frölunda VC	5	0	441	394	47	0,893424	0,0562213	7844						

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Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN
NH Gibraltargatan VC	5	0	449	435	14	0,96882	0,0572412	7844					
NH Högsbo VC	5	0	338	304	34	0,899408	0,0430903	7844					
NH Kungshöjd VC	5	0	339	338	1	0,99705	0,0432177	7844					
NH Kungssten VC	5	0	347	330	17	0,951009	0,0442376	7844					
NH Majorna VC	5	0	336	278	58	0,827381	0,0428353	7844					
NH Masthugget VC	5	0	282	279	3	0,989362	0,035951	7844					
NH Olskroken VC	5	0	374	374	0	1	0,0476798	7844	0,161969	0,1431	0,9435399	7389	0,548387097
NH Opaltorget VC	5	0	270	270	0	1	0,0344212	7844					
NH Skogslyckan VC	5	0	332	332	0	1	0,0423253	7844					
NH Slottsskogen VC	5	0	.	.	.	########	.	7844					
NH Styrsö VC	5	0	116	116	0	1	0,0147884	7844					
NH Torpavallen VC	5	0	241	233	8	0,966805	0,0307241	7844					
Nötkärnan Hovås Askin Familjeläkare och BVC	5	1	277	242	35	0,873646	0,0353136	7844					
Nötkärnan Masthugget Familjeläkare och BVC	5	1	202	202	0	1	0,0257522	7844					
VC Carlanderska	5	1	268	240	28	0,895522	0,0341662	7844					
VC Läkarhuset	5	1	177	137	40	0,774011	0,022565	7844					
Västerledens VC, Grimmered	5	1	213	199	14	0,934272	0,0271545	7844					
Wästerläkarna	5	1	597	596	1	0,998325	0,0761091	7844					
Bräcke Diakoni VC Centrum, Alingsås	6	1	168	168	0	1	0,0569685	2949					
Carema VC Noltorp	6	1	166	166	0	1	0,0562903	2949	0,060893	0,0611	0,9403119	8144,75	0,25
NH Floda VC	6	0	272	255	17	0,9375	0,0922347	2949					
NH Gråbo VC	6	0	217	197	20	0,907834	0,0735843	2949					

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NH Herrljunga VC	6	0	244	234	10	0,959016	0,0827399	2949						
NH Lerum VC	6	0	571	496	75	0,868651	0,193625	2949						
NH Sjöbo VC	6	0	194	187	7	0,963918	0,065785	2949						
NH Sollebrunn VC	6	0	68	50	18	0,735294	0,0230587	2949						
NH Sörhaga VC	6	0	113	109	4	0,964602	0,0383181	2949						
NH Vårgårda VC	6	0	377	377	0	1	0,1278399	2949						
NH Ängabo VC	6	0	358	339	19	0,946927	0,1213971	2949						
Sävelången Familjeläkare, Alingsås	6	1	201	201	0	1	0,0681587	2949						
Adina Hälsans VC Sävedalen	7	1	318	317	1	0,996855	0,0713324	4458						
Allemanshälsans VC, Jungfruplatsen	7	1	216	216	0	1	0,0484522	4458						
Capio VC Hovås/Billdal	7	1	217	217	0	1	0,0486765	4458						
Capio VC Sävedalen	7	1	491	412	79	0,839104	0,1101391	4458						
Carema VC Mölndal	7	1	121	121	0	1	0,0271422	4458						
Ekenhälsan, Kållered	7	1	74	74	0	1	0,0165994	4458						
Fredriksdals Läkarhus	7	1	209	208	1	0,995215	0,046882	4458						
Hälsans hus, Landvetter	7	1	84	75	9	0,892857	0,0188425	4458						
Johannesvården VC	7	1	220	220	0	1	0,0493495	4458	0,092052	0,0829	0,9755522	6635,95		0,6
Läkargruppen Mölndalsbro KB	7	1	288	274	14	0,951389	0,064603	4458						
NH Furulund VC	7	0	129	129	0	1	0,0289367	4458						
NH Hindås VC	7	0	75	75	0	1	0,0168237	4458						
NH Krokslätt VC	7	0	176	176	0	1	0,0394796	4458						

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Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN
NH Landvetter VC	7	0	242	241	1	0,995868	0,0542844	4458					
NH Lindome VC	7	0	267	256	11	0,958801	0,0598923	4458					
NH Mölnlycke VC	7	0	364	354	10	0,972527	0,081651	4458					
NH Partille VC	7	0	558	530	28	0,949821	0,1251682	4458					
NH Åby VC	7	0	167	167	0	1	0,0374607	4458					
Nötkärnan Kållereds Familjeläkare och BVC	7	1	120	117	3	0,975	0,0269179	4458					
Rävlanda VC	7	1	122	120	2	0,983607	0,0273665	4458					
Allékliniken Sleipner	8	1	247	233	14	0,94332	0,0509699	4846					
Brämhults VC	8	1	255	255	0	1	0,0526207	4846					
Cityläkarna Borås	8	1	.	.	.	########	.	4846					
HälsoBrunnen VC, Ulricehamn	8	1	246	214	32	0,869919	0,0507635	4846					
NH Boda VC	8	0	310	310	0	1	0,0639703	4846					
NH Bollebygd VC	8	0	254	254	0	1	0,0524144	4846					
NH Dalsjöfors VC	8	0	169	161	8	0,952663	0,0348741	4846					
NH Dalum VC	8	0	145	120	25	0,827586	0,0299216	4846					
NH Fristad VC	8	0	218	218	0	1	0,0449856	4846					
NH Heimdal VC	8	0	351	350	1	0,997151	0,0724309	4846					
NH Horred VC	8	0	33	33	0	1	0,0068097	4846					
NH Kinna VC	8	0	167	128	39	0,766467	0,0344614	4846					
NH Sandared VC	8	0	126	108	18	0,857143	0,0260008	4846					
NH Skene VC	8	0	119	119	0	1	0,0245563	4846	0,100064	0,1199	0,9355199	8346,261	0,260869565
NH Svenljunga VC	8	0	274	263	11	0,959854	0,0565415	4846					
NH Sätila VC	8	0	183	156	27	0,852459	0,0377631	4846					
NH Södra Torget VC	8	0	237	237	0	1	0,0489063	4846					
NH Trandared VC	8	0	272	237	35	0,871324	0,0561288	4846					

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NH= Närhälsan

Appendix: Data of health care guarantee fulfillment for each provider in VGR

Primary care provider	HSN	Private	Tot visits	Visits in guarantee	Visits, not guarantee	Fulfillment (%)	Weighted tot visit	Visits in HSN	Visits HSN/VGR	HSN share of pop.	Fulfillment /HSN	Pop/PCP	Private/HSN
NH Tranemo VC	8	0	255	253	2	0,992157	0,0526207	4846					
NH Ulricehamn VC	8	0	511	435	76	0,851272	0,1054478	4846					
NH Viskafors VC	8	0	60	56	4	0,933333	0,0123813	4846					
VC Fritsla Medhelp AB	8	1	90	83	7	0,922222	0,018572	4846					
VC Herkules	8	1	324	319	5	0,984568	0,0668593	4846					
Carema VC Grästorp	9	1	157	157	0	1	0,0478805	3279					
Kinnekullehälsan VC Götene	9	1	95	89	6	0,936842	0,0289722	3279					
NH Floby VC	9	0	187	177	10	0,946524	0,0570296	3279					
NH Guldvingen VC	9	0	555	553	2	0,996396	0,1692589	3279					
NH Götene VC	9	0	283	283	0	1	0,0863068	3279					
NH Mösseberg VC	9	0	206	204	2	0,990291	0,062824	3279					
NH Nossebro VC	9	0	153	152	1	0,993464	0,0466606	3279	0,067707	0,08	0,9862204	9847,231	0,307692308
NH Oden VC	9	0	229	229	0	1	0,0698384	3279					
NH Skara VC	9	0	531	530	1	0,998117	0,1619396	3279					
NH Stenstorp VC	9	0	130	130	0	1	0,0396462	3279					
NH Vara-Kvänum VC	9	0	487	476	11	0,977413	0,1485209	3279					
VC Kurhälsan - Falköping	9	1	110	108	2	0,981818	0,0335468	3279					
VC Vilan - Skara	9	1	156	156	0	1	0,0475755	3279					
Allemanshälsans VC, Lunden	10	1	144	144	0	1	0,0393658	3658					
Centralhälsan Falköping	10	1	.	.	.	########	.	3658					
Hälsocentralen i Hjo	10	1	131	131	0	1	0,0358119	3658					
Kinnekullehälsan VC Mariestad	10	1	220	213	7	0,968182	0,0601422	3658					
NH Billingen VC	10	0	357	343	14	0,960784	0,0975943	3658					

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NH Gullspång/Hova VC	10	0	148	137	11	0,925676	0,0404593	3658					
NH Hentorp VC	10	0	336	254	82	0,755952	0,0918535	3658					
NH Karlsborg VC	10	0	234	214	20	0,91453	0,0639694	3658					
NH Mariestad VC	10	0	585	584	1	0,998291	0,1599235	3658					
NH Norrmalm VC	10	0	342	306	36	0,894737	0,0934937	3658					
NH Södra Ryd VC	10	0	.	.	.	########	.	3658					
NH Tibro VC	10	0	181	157	24	0,867403	0,0494806	3658					
NH Tidaholm VC	10	0	298	268	30	0,899329	0,0814653	3658	0,075533	0,0806	0,9423296	7163,389	0,388888889
NH Tidan VC	10	0	128	128	0	1	0,0349918	3658					
NH Töreboda VC	10	0	162	162	0	1	0,0442865	3658					
Skagerns Vård och Hälsoenhet	10	1	150	148	2	0,986667	0,041006	3658					
VC Centrum, Skövde	10	1	178	164	14	0,921348	0,0486605	3658					
VC City, Skövde	10	1	64	63	1	0,984375	0,0174959	3658					
Backa Läkarhus	11	1	557	556	1	0,998205	0,1156561	4816					
Capio Citykliniken Amhult	11	1	224	222	2	0,991071	0,0465116	4816					
NH Backa VC	11	0	453	415	38	0,916115	0,0940615	4816					
NH Biskopsgården VC	11	0	450	371	79	0,824444	0,0934385	4816					
NH Bjurslätt VC	11	0	293	292	1	0,996587	0,0608389	4816					
NH Brämaregården VC	11	0	538	533	5	0,990706	0,111711	4816					
NH Eriksberg VC	11	0	296	295	1	0,996622	0,0614618	4816					
NH Kyrkbyn VC	11	0	215	213	2	0,990698	0,0446429	4816					
NH Kärra VC	11	0	313	313	0	1	0,0649917	4816					
NH Torslanda VC	11	0	250	250	0	1	0,0519103	4816	0,099445	0,0897	0,9772793	10258,5	0,357142857
NH Tuve VC	11	0	245	241	4	0,983673	0,0508721	4816					

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Nötkärnan Friskväderstorgets VC och BVC	11	1	251	251	0	1	0,0521179	4816					
Selmas Läkarhus	11	1	322	320	2	0,993789	0,0668605	4816					
Torslanda Läkarhus	11	1	409	409	0	1	0,0849252	4816					
Angereds Läkarhus	12	1	598	598	0	1	0,1700313	3517					
Familjehälsan VC	12	1	198	189	9	0,954545	0,056298	3517					
Nya VC Kortedala torg	12	1	112	110	2	0,982143	0,0318453	3517					
NH Angered VC	12	0	451	265	186	0,587583	0,1282343	3517					
NH Björkekärr VC	12	0	189	174	15	0,920635	0,053739	3517					
NH Ekmanska VC	12	0	119	112	7	0,941176	0,0338357	3517					
NH Gamlestadstorget VC	12	0	309	271	38	0,877023	0,087859	3517					
NH Hjällbo VC	12	0	319	306	13	0,959248	0,0907023	3517					
NH Lövgärdet VC	12	0	216	195	21	0,902778	0,061416	3517					
Nötkärnan Bergsjön VC och BVC	12	1	667	667	0	1	0,1896503	3517	0,072622	0,095	0,9177848	13818,27	0,454545455
Nötkärnan Kortedala VC och BVC	12	1	339	329	10	0,970501	0,096389	3517					
							Sum visits	48429			0,9603178	8249,727	

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