



Project: Accessibility to Health Services in Iceland
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1. INTRODUCTION

Byggðastofnun has commissioned Nordregio to conduct a comprehensive assessment of the accessibility that all Icelandic residents have to the full range of public health services throughout Iceland. Additionally, Byggðastofnun has asked Nordregio to provide an overview of the national level discourse on public health policy, particularly focussing on how other countries deal with the issue of accessibility, particularly in rural, remote and sparsely populated areas. The intent of this work is to support the on-going policy discussion regarding the distribution of public services, including, but not limited to, health services. Below, we will present a short background for our work, an overview of our analytical approach, presentation of results, followed lastly by a discussion of the spatial dimensions of Nordic national health policies.

2. BACKGROUND

Iceland's Strategic Regional Plan (2014-2017) has principle objectives of: creating greater equality of opportunity for work and services for all people in the country; mitigating differences in living standard; and promoting sustainable development of the regions in all parts of the country. Special support shall be given to regions suffering from downward demographic trends and heavy dependence on single sector industries. The inspiration behind the Strategic Regional Plan thus has an explicit spatial objective – development needs to become more balanced among all the regions of Iceland.

The plan has four designated areas where targeted actions must be undertaken: (1) Infrastructure, (2) Special measures in vulnerable communities, (3) Employment and (4) Public Services.

Specifically regarding the fourth key area – public services – there is an objective that: “the inhabitants of Iceland, irrespective of place of residence and personal means, should enjoy the same opportunities as regards access to public services as a consonant with the demands of a modern society.” As such, the rights of citizens to basic services in all parts of the country should be defined for principle areas of public services, e.g. as regards medical services, policing, education, culture, communications, and telecommunications.

This pilot study objectively and quantitatively measures the accessibility of all Icelandic residents to health services. Health services are defined based on the locations presented on the Ministry of Welfare's website (http://www.velferdarraduneyti.is/tolfraedi_heilb/).

3. ANALYTICAL APPROACH

Accessibility is measured using a network analysis of: the location of each health facility, the distribution of the population (using a 1km² population density grid) and the road network (including speed limits). The data sources used in the analysis are as follows:

1. Health Facility Locations: Ministry of Welfare, Iceland & Byggðastofnun
2. Distribution of the Population: Registers Iceland and the National Land Survey, 2015
3. Road network, including speed limits: Open Street Map

Using the information above, we determined whether or not each populated grid cell is “accessible” within a 30 minute and 60 minute driving time threshold to each health facility. These results are shown on maps, where populated areas within green buffer areas are accessible to the given typology of health service defined by the map. Likewise, the tabular results present the percentage of the population in each administrative unit that has access to the given typology of health service. Put simply, what percentage of the regional population is accessible to “X” type of healthcare facility in a “Y” period of time by driving.

Health facilities are mapped based on the grouping presented below. The logic has been to start with the most comprehensive medical facilities then step-wise adding additional facilities to the analysis.

1. Specialised hospitals (2)
2. Specialised hospitals (2) & Hospitals with 24/7 surgical services (3)
3. Specialised hospitals (2) & Hospitals with 24/7 surgical services (3) & Hospitals with overnight care (6)
4. Specialised hospitals (2) & Hospitals with 24/7 surgical services (3) & Hospitals with overnight care (6) & Primary health care centres (47)
5. Specialised hospitals (2) & Hospitals with 24/7 surgical services (3) & Hospitals with overnight care (6) & Primary health care centres (47) & Part time health care centres (22)

3.1 Detailed GIS methodology

The methodological core of the study is that of network analysis, or its subfields of service area / market area analysis. Network analysis is the study of graphs and relations between discrete objects, rooted in graph theory¹. In the field of geographic information systems (GIS), network analysis typically concerns relations of objects in a “graph”, typically based on a traffic system network and corresponding spatial data (Fischer, 2004). Network analysis is the basis of many common GIS analysis and processing tasks, the most important being possibly that of routing, used e.g. in web map services and navigators. Simple routing analyses can be further refined into analyses of service

¹ Graph theory. V.B. AlekseevV.P. KozyrevA.A. Sapozhenko (originator), Encyclopedia of Mathematics. URL: http://www.encyclopediaofmath.org/index.php?title=Graph_theory&oldid=15471

or market areas, accessibility to any spatially defined object, to name a few. Typical GIS-based service area analyses are almost always based on graph theory.

Open GIS and open data, especially open spatial data has enabled an increasing utilization of spatial analysis in spatial analysis and planning tasks. In this research project, the network used in the analysis was created from spatial data on the Icelandic traffic network, acquired from OpenStreetMap (OSM), a collaborative open database project for creating a free map of the world. The data was downloaded from GeoFabrik, a company who create regular extracts of the latest OSM data (which by nature is continuously updated) for free download. The data was dated and downloaded 23.5.2015. Especially in more economically developed countries the OSM data contains traffic network route/location data and corresponding attribute data on speed limits in high quality, often more detailed than in many conventional web map services.

In order to be used in network analysis, raw OSM traffic network data must be converted into a routable network (a graph, its nodes and edges/paths and different rules between these). This can be achieved in multiple ways, but here the open osm2po converter was used. Its algorithm stores the graph as spatial SQL data. In another project at Nordregio, a Python programming language -based script was created that utilizes the open PostgreSQL database management system, its spatial extender PostGIS and pgRouting extension to calculate routing algorithms on OSM data -based network graphs. The script was run in the open GIS software Quantum GIS (QGIS). The routing algorithm used here was a variant of Dijkstra's algorithm², possibly the most used routing algorithm for calculating shortest paths between graph nodes. The used algorithm can take into account different "costs" along the network, based on which a so called cost distance can be calculated. Different properties of the traffic network could be here used as "cost" parameters, speed limit, distance and driving time, to name a few. The OSM traffic network data includes abundant speed limit information, containing different speed limits for e.g. different road segments and types.

Put simply, the algorithm calculates shortest paths from a given set of points, in this case locations of health care facilities, and finds the paths and nodes of the network that can be reached within the given cost limits. As we were interested in the areas that can be reached, so called alpha shapes were created for these nodes of reachability, in other words minimum enclosing polygons for the furthestmost reachable network nodes from each given facility. As in this case we were interested in the service or catchment areas of health care facilities based on car traffic, those locations along the road network were selected and enclosed with a service area polygon that could be reached from a given facility within 30 or 60 minutes driving time. These polygons then enabled us to analyse the spatial configuration of Iceland's population in relation to the areas where health care facilities are accessible within the desired time limit, as the created "accessibility polygons" could be spatially joined to provided population grid data. The time thresholds used in this study 30 and 60 minutes

² Dijkstra algorithm. M. Hazewinkel (originator), Encyclopedia of Mathematics. URL: http://www.encyclopediaofmath.org/index.php?title=Dijkstra_algorithm&oldid=11354

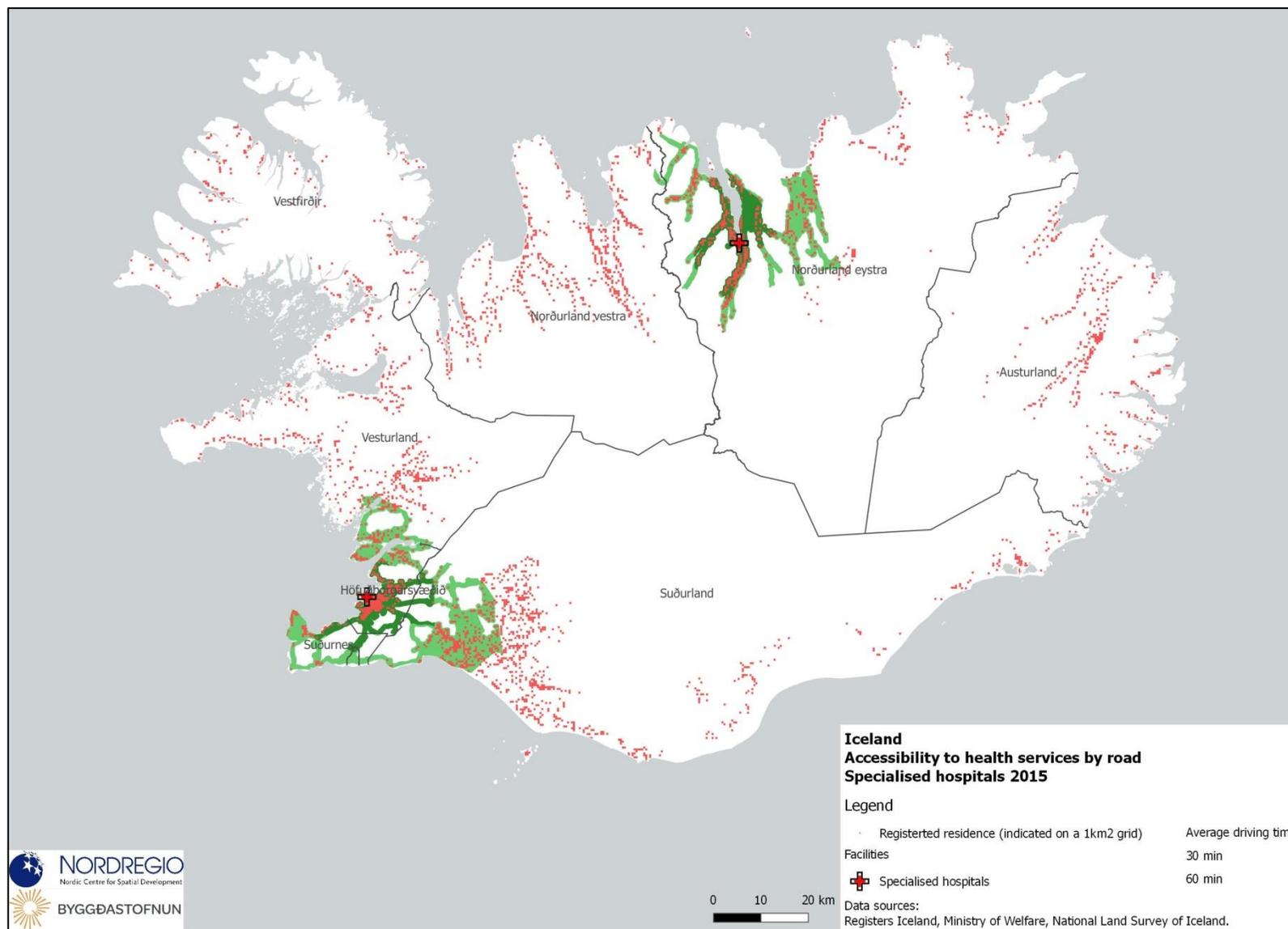
roughly correspond to similar studies on service reachability in other Nordic countries³, where such time distances have been found typical in accessing local and regional level services. In order to fine-tune the accessibility polygons, unpopulated mountainous areas (> 500 m.a.s.l.), areas far from population (>10 km) and sea areas were removed from the polygons.

The population data used in the study was created in 2015 by Registers Iceland at 1 km² spatial resolution, received via Byggðastofnun. The health care facilities/institutions data was created by and received from Byggðastofnun, created from data by the Ministry of Welfare and the search engines landlaeknir.is and ja.is. The data, received in an address list format, was geocoded in QGIS. After the health care accessibility information was attached to the population grid data, statistics on the population's health care accessibility in Iceland and its regions were calculated in QGIS.

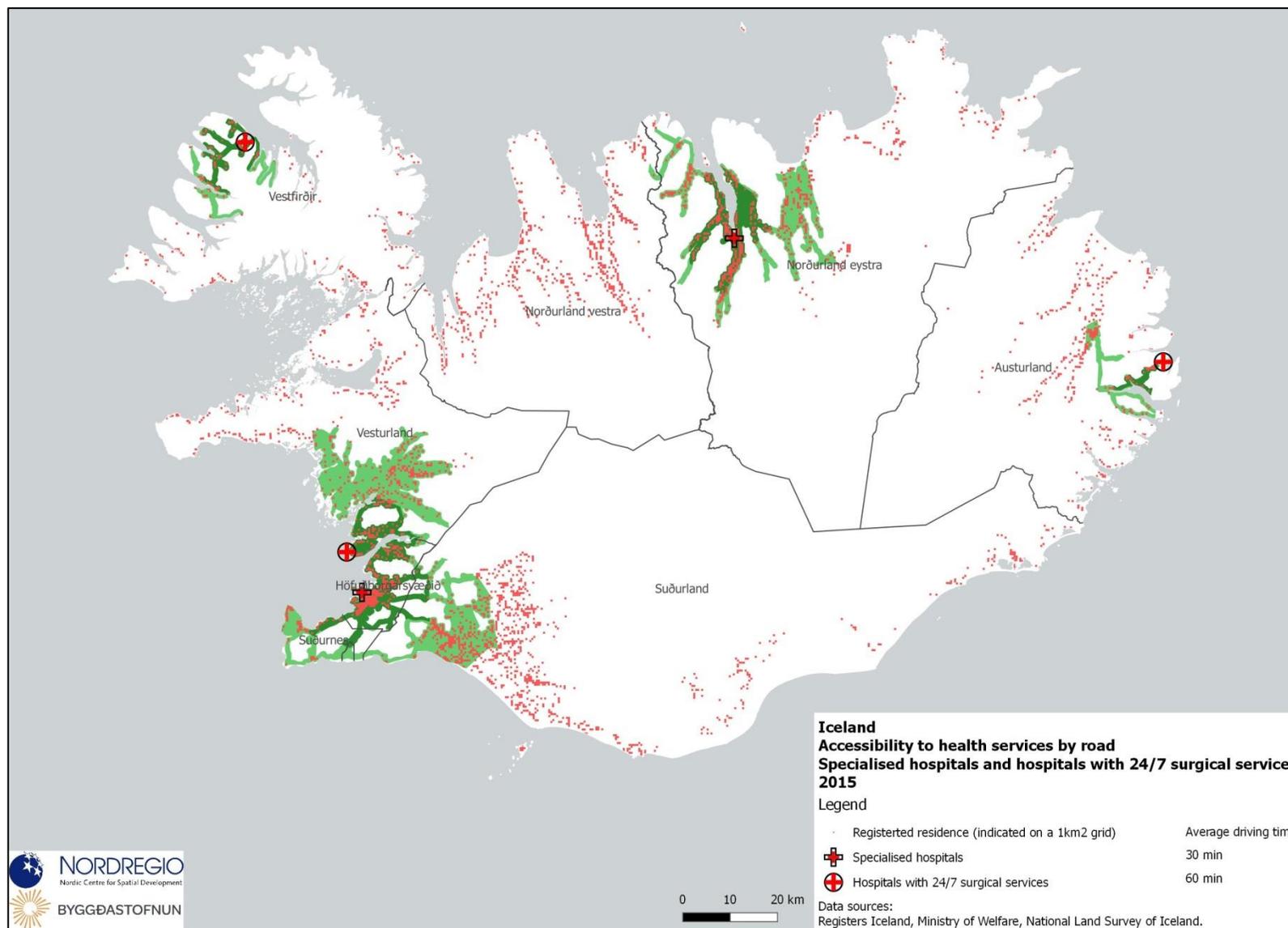
4. RESULTS

In the following pages each of the maps are presented sequentially, followed by corresponding tables showing the regional results.

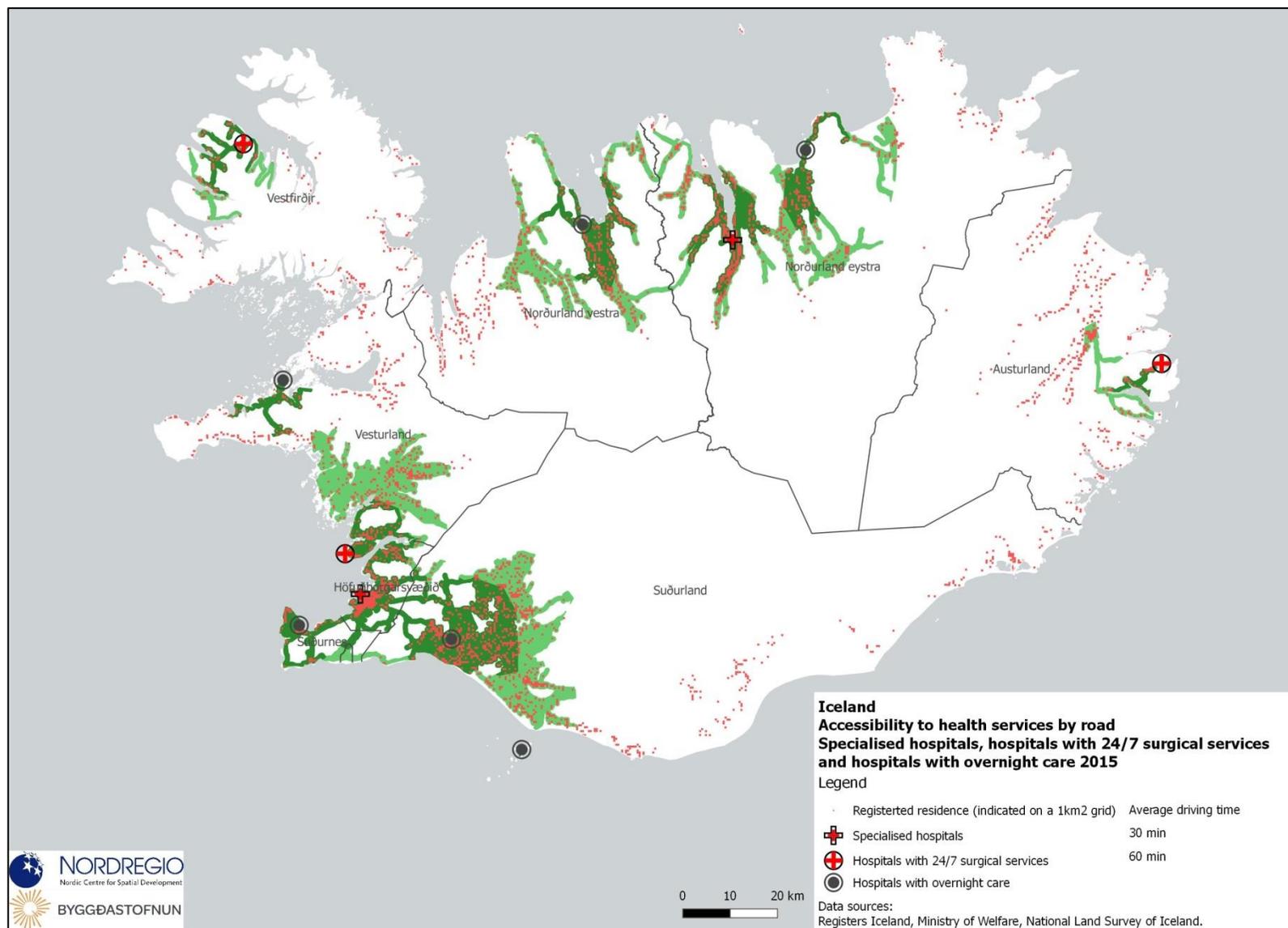
³ Tammi, I. Pirkanmaan palveluverkko 2040.
<http://maakuntakaava2040.pirkanmaa.fi/sites/default/files/Pirkanmaan%20palveluverkko%202040.pdf>



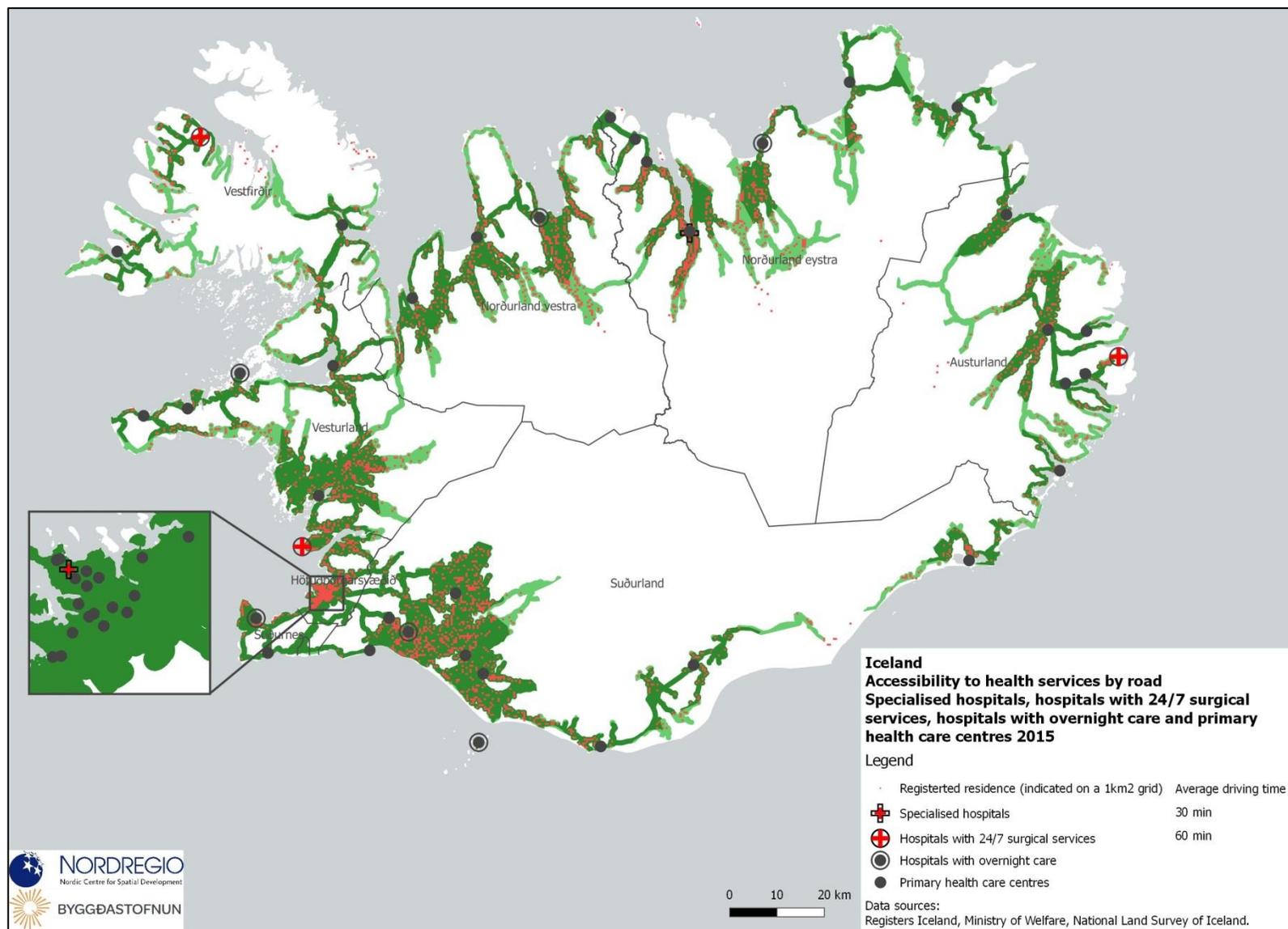
Map 1



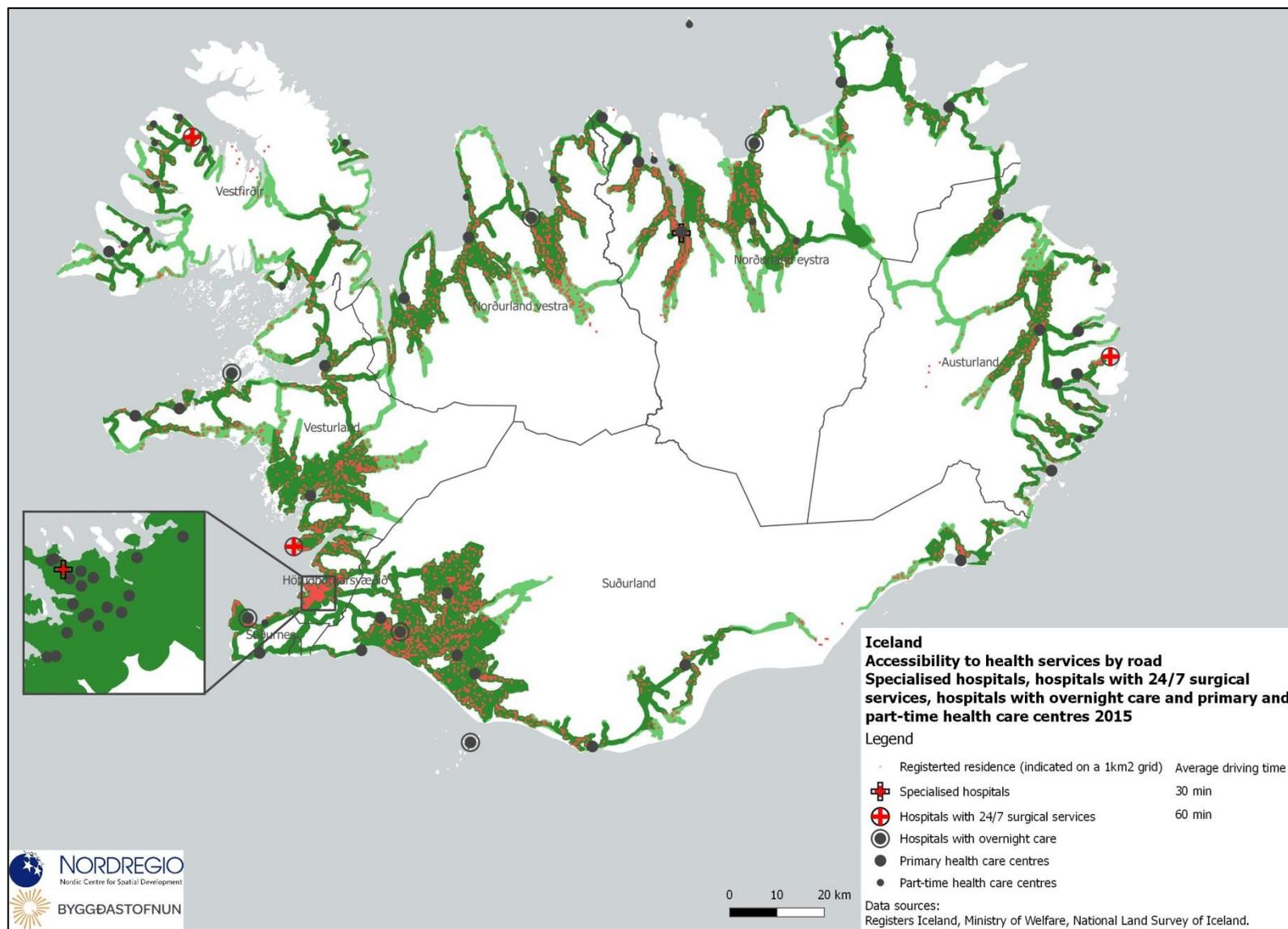
Map 2



Map 3



Map 4



Map 5

TABLES

Table 1 Accessibility to specialized hospitals for total population (%)

Region	30min	60min
Höfuðborgarsvæðið	99,90	100,00
Suðurnes	5,84	99,79
Vesturland	0,00	62,37
Vestfirðir	0,00	0,00
Norðurland vestra	0,00	0,27
Norðurland eystra	70,66	82,69
Austurland	0,00	0,00
Suðurland	0,01	51,43
Total	70,85	85,39

Table 2 Accessibility to specialised hospitals and hospitals with 24/7 surgical services for total population (%)

Region	30min	60min
Höfuðborgarsvæðið	99,99	100,00
Suðurnes	5,84	99,86
Vesturland	61,03	70,87
Vestfirðir	64,03	67,94
Norðurland vestra	0,00	0,27
Norðurland eystra	70,66	82,69
Austurland	33,88	70,87
Suðurland	0,01	51,43
Total	76,17	89,42

Table 3 Accessibility to specialised hospitals, hospitals with 24/7 surgical services and hospitals with overnight care for total population (%)

Region	30min	60min
Höfuðborgarsvæðið	99,99	100,00
Suðurnes	99,86	99,86
Vesturland	74,54	95,79
Vestfirðir	64,03	67,94
Norðurland vestra	53,37	82,79
Norðurland eystra	80,37	92,10
Austurland	33,88	70,87
Suðurland	75,05	87,79
Total	91,21	96,15

Table 4 Accessibility to specialised hospitals, hospitals with 24/7 surgical services, hospitals with overnight care and primary health care centres for total population (%)

Region	30min	60min
Höfuðborgarsvæðið	100,00	100,00
Suðurnes	99,86	99,86
Vesturland	97,87	99,97
Vestfirðir	89,36	98,44
Norðurland vestra	93,81	99,83
Norðurland eystra	95,59	99,58
Austurland	92,90	99,72
Suðurland	99,02	99,88
Total	98,84	99,90

Table 5 Accessibility to all facilities for total population (%)

Region	30min	60min
Höfuðborgarsvæðið	100,00	100,00
Suðurnes	99,86	99,86
Vesturland	97,87	99,97
Vestfirðir	96,73	99,34
Norðurland vestra	94,40	99,83
Norðurland eystra	99,12	99,97
Austurland	98,11	99,81
Suðurland	99,02	99,88
Total	99,48	99,95

5. NORDIC NATIONAL HEALTH POLICIES

Provision of health care services has been a central political/policy issue in the other Nordic countries. This is especially the case in Finland, where a debate over the distribution of decision making for the health sector is on-going. Other key trends include the issue of health sector privatisation in Sweden and administrative reform in Denmark. Likewise there is generally a two-tier approach, with primary care (often including elderly and long-term care) being handled at the municipal level, with specialized care and hospitals organized at the regional or national level (with the exception of Finland where the aforementioned reforms are addressing this issue). Generally speaking, there are trends toward ensuring sufficient distribution of primary care throughout countries (e.g. in rural and remote areas), combined with concentration of specialized services in central areas and innovative solutions to reduce spatial barriers to health services. This especially includes air transport and IT solutions.

The following synopsis of Nordic spatial dimensions of health care is based on Nordregio working material within the Nordic Working Group on Demography, as well as reference to academic research and specific investigations into national policy discourses. National profiles are presented below, followed by a short discussion.

5.1 Sweden

Responsibility for specialist and hospital health care in Sweden is placed on the county council while primary and elderly care is the responsibility of the municipalities. The 21 county councils coordinate specialist health care in six health care districts. In each district there is a university hospital responsible for the education of medical doctors, nurses and other personnel. In 2007, a government investigation was published proposing a reform of the regional structure in Sweden. The aim was to merge the existing county councils into larger units in order that they had a population base large enough to ensure the financing and efficiency of specialist health care. The ambition was also to move the responsibility for regional development issues to the elected regional level. This reform proposal was however not realised at that time though the question of merging county councils to increase efficiency in health care remained on the agenda. In spring 2015, the question of merging county councils re-emerged on the political agenda as the government appointed two officials to suggest new geographical borders for Sweden's regions based on transport, labour-market, health care, education, culture and environmental issues (Ministry of Finance, 2015).

The general policy debate in Sweden about the provision of health care is currently focused on the issues of inequality in health care between different county councils, long waiting times, the difficulties associated with concentrating specialist health care facilities and need for more cost efficient health care (Swedish Agency for Health and Care Services Analysis, 2014).

Telemedicine is increasingly used as a way of providing health care at a distance both in sparsely populated parts of Sweden in particular and in the country as a whole more generally. The main purpose of the care at a distance initiative is to be able to provide health care closer to the patient and to make specialist health care competence available where it is needed (Läkartidningen, 2014). The national agency for innovation, Vinnova has financed a project to establish a national platform for care at a distance (telemedicine) which has been implemented by Karolinska University hospital in Stockholm and Västerbotten County Council (Vinnova, 2015).

In 2015, Tillväxtanalys (Growth Analysis) conducted a study on Service Accessibility in Sweden. Concerning health care, their findings showed that recent trends have followed the same pattern as during preceding years: the number of permanent service facilities has decreased for most types of services. However, the deregulation of pharmacies and the choice of healthcare reforms have meant that the number of primary care pharmacies and health clinics has increased during the last five years which, from a national perspective, has led to improved accessibility to pharmaceuticals and health clinics.

A follow-up study by Tillväxtanalys shows that the number of health clinics has increased considerably since 2007. The increase has mainly occurred in areas with *high* or *very high* accessibility to towns. 80 % of all health clinics are located in these areas. The greater number of health clinics is almost exclusively a result of an increase in private health clinics. In 2014, more than 95,000 people had at least a 20-minute car journey to their closest health clinic while 29,000 people had more than a 30-minute journey. The majority of people, just over 97 % of the population, have less than 20 minutes to their closest health clinic. However, the study did not distinguish between type of health service, it was strictly concerning health clinics, regardless of services provided, opening hour, etc. No other study regarding the measurement of health accessibility was found.

5.2 Denmark

Access to high-quality healthcare was an important part of the municipal reform that took place in 2007. However, accessibility was not determined in terms of distance – instead the guidelines from the Ministry of Health stated minimum population thresholds for new future hospital structure. At the heart of Danish public health policy is the notion that quick access to appropriate treatment for the injured or acutely ill should be available to all. This can only be ensured by means of a dense network of local health care service facilities, even in their remote and sparsely populated areas. In sparsely populated areas where people have to travel significant distances to access even primary health needs, emergency and specialised services are being increasingly integrated, so that resources for referral and treatment are used in the most efficient way possible. For example, in 2010 the parliament decided to allocate funds to the local health care services in rural areas and boost medical helicopter arrangements.

National strategy for digitalization of health care 2013-2017

Denmark's growing elderly population have also necessitated significant cross-sector efforts, including better collaboration between hospitals, municipalities and the general practices. Thus, the need arises for the re-organisation of health care services, where specialized treatment is centred in fewer, more specialised hospitals, and where more tasks can be solved closer to if not in the patient's own home- Here, digitization is a key tool in the creation of more accessible, coherent and efficient health care services. The strategy was prepared by the National Board of Health IT, and sets an ambitious course of action for further work in this area. The main focus areas of the strategy are better and more effective treatment, increased patient safety, and easier workflows for staff. This means an increased focus on the dissemination and application of existing IT solutions, including the phasing out of paper-based workflows. The strategy includes the following five focus areas:

1. Health to citizens in new ways, including telemedicine and telehealth
2. Digital workflows and processes
3. Consistency in patient care
4. Better use of data
5. Prioritising, execution and visibility

Medical coverage in all regions of the country

In some regions attracting medical staff has become a challenge. A change in the Health Act in 2014 aimed at ensuring that people in all parts of the country have access to a general practitioner. With the amendment, the regions have among other things been given new opportunities to establish and run general practice clinics themselves, and to outsource the operation of the practice to private actors. This organisational approach to general practice clinics is relatively new, but the Ministry is aware that the regions have already started to set up clinics within this new framework.

Key documentation (in Danish): <http://sim.dk/media/67783/Regionalpolitisk-redegoerelse-2010.pdf> (specific section: "Styrkelse af den præhospital indsats og de nære tilbud")

5.3 Norway

The health care system is semi decentralised; responsibility for specialist care lies with the state (administered by four Regional Health Authorities), while the municipalities are responsible for primary and long term care. Health "coordination reform" emerged in 2011 as an attempt to improve the coordination of hospital care with other health services in order to reduce waiting times (Ringard et al., 2013). In June 2011 'the Coordination Reform' (Report No. 47 2008–2009), was passed in the Parliament. The report highlights the consequences of demographic change for health care utilisation and proposes major structural reforms to reduce the demand for hospital services. The main tools in the reform are economic incentives, legal means and the restructuring of tasks and responsibilities between the specialist and primary health care sectors (Romøren et al., 2011). In the Care Plan 2020 (White Paper no. 29, 2012-2013) the Government followed up on the care plan 2015 by launching a raft of new measures with a stronger focus on innovation in the public sector. This new 'innovation programme' will contribute to the development and introduction of welfare technologies, new methods, and new organisational solutions adapted to future needs. At the same time it will form the basis for state and municipal planning, with special measures to support and

stimulate municipal efforts on research, innovation and development in the care field for the period up to 2020. This will be done through:

- Reinforcing the regional health and care centres such that they become important partners in research, development and innovation activities.
- Alignment of some of the instruments managed by innovation and research institutions at the national level in order to promote innovation in municipal health and care services.
- Strengthen efforts related to research, innovation and development both in the municipalities and through relevant programmes administered by the Norwegian Research Council.

While the Care Plan 2020 is part of a comprehensive innovation effort in the municipal sector as a whole, we were unable to find concrete discussions on the issue of monitoring or understanding the accessibility to health care services.

5.4 Finland

Perhaps the most interesting in relation to Iceland is Finland, where ongoing reforms to the public health sector are a crucial political/policy issue at present. The general aim of the reform has been to respond to the challenges faced by the municipalities and to ensure that high-quality services can be provided to all citizens independent of their place of residence. The reform has aimed to do this by effectively centralising the health care system, which has hitherto been decentralised and where the municipalities have traditionally had tasks and responsibilities for primary AND specialized health care (Finnish Ministry of Social Affairs and Health, 2014).

Currently, each municipality shall see to it that residents receive the necessary specialized medical care as referred to in the Health Care Act. In order to organize specialized medical care in accordance with this obligation, each municipality must belong to a joint municipal hospital district to ensure that services are available and universally accessible in their area to the residents, emergency medical care, including emergency medical services, air ambulance and patient transfers. According to Section 45 of the Health Care Act, only in highly specialized cases and in certain areas are they centralized on a national level in specific catchment areas.

A major reform of the health care and social services provision is currently being prepared in Finland, and it is estimated that the new system could be operational in 2018-2019. As one of the key elements of the reform, the role of organizing health care provision will be transferred from municipalities and joint municipal authorities to regional authorities, especially in the case of specialized care. As a part of the reform the autonomy of the regions/provinces will be strengthened and at the same time almost half of the tasks of municipalities (health and social services) will be transferred to the regional entities. This will reduce the number of organizing health care authorities from almost 200 to 15-18, according to the current statements of legislators. As a part of the reform

is to find significant savings in public health care provision, it is likely that the process will lead to significant digitalization of health care services accompanied with minimizing the amount of health centers, especially as of specialized care units.

Up to date news and information on the process can be found at:

<http://alueuudistus.fi/en/frontpage>

Status quo of health service accessibility in Finland

Rehunen et al. (2012) found that:

- In rural settlements circa 20 % of the inhabitants had a distance of over 5 km to a health center.
- In sparsely populated areas, over 50 % of the inhabitants live over 10 km from a health center and 5 % of the people had a distance of over 30 km.
- Most of the people with a distance of over 10 km lived in the sparsely populated regions of Lapland, Kainuu, Northern Savonia and Ostrobothnia. Poor accessibility in Lapland, Finnish Lakeland and the archipelagoes is often due to the demanding geographies.
- Of all Finns 94 % lived under 15 minute car drive away from a health center.

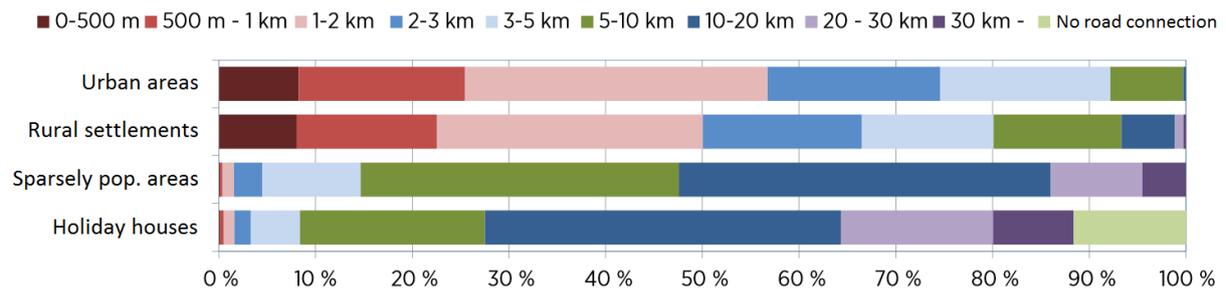


Figure 1: Distance to health centres from different types of areas in Finland. Source: Rehunen et al. 2012. (modified).

Huotari et al. (2012) have analyzed accessibility to 24h health services. They established:

- Approximately 72 % of residents are within 20 minutes of at least one 24h service; 20 % within 20-40min, 5 % within 40-60min, 3 % within 60-90min and <1 % within over 90min. If the number of 24h facilities were cut down to half, the corresponding figures would be 63, 23, 9, 4 and 1 %. If they were cut down to 20 facilities, the figures would be 54, 25, 13, 6 and 2 %. Notably, the ongoing health and social services reform could lead to such reduction of 24h health service units.
- On average, residents have a 48 minute time distance to university hospitals, ranging from 19 minutes (median) in the Helsinki region to 1h 45 minutes in the Kuopio university hospital catchment. There are currently 20 “central hospitals”, that 62,8 % of the people can reach in less than 30 minutes, 26 % in 30-60 minutes, 10 % in 1-2 hours and 1 % in 2 hours or more. The accessibility status quo as of the 30 current delivery wards (note: some of the wards have closed down after the study) was similarly 79 %, 17 %, 4 % and 1%, the median being circa 14 minutes.

In Finnish legislation the accessibility to health care services has been defined in a vague manner, yet discussion on the sufficiency of health care accessibility is always ongoing. The issue of what should be considered local, regional or national level health services has been discussed by Zitting & Ilmarinen (2010) in their report “Where are local services? The definition and use of the concept of local services in public documents”. According to the report, health care professionals and authorities were asked what kind of health services should be provided locally. These were:

- open general practitioner’s reception / consulting hours, dentist’s reception
- maternity / child health counseling (possibly other adults and seniors as well)
- school health care and if possible, occupational health services
- in bigger municipalities, health ward services
- in-home care

Formulating the composition of service provision was seen a rather local question that should take into account specific regional considerations. A local level was here considered the municipal level. According to the experts, local health services should be “lightweight”, aimed at the whole population’s everyday needs. Experts are reluctant in defining what is a sufficient distance to health services, and commonly the access to health services is defined as being “within a reasonable distance”. However the network of health care units should be sufficiently evenly dispersed so that traveling doesn’t become an obstacle for seeking care.

In conclusion, the process of defining local services was deemed difficult, but four main criteria came up:

- Frequency of service use (e.g. daily, weekly, monthly, yearly)
- Customer amount/basis (number of inhabitants required to sustain the service)
- Accessibility / reachability (traveling to the service shouldn’t become an obstacle)
- Humanity (the services should take into consideration the people’s actual needs)

Furthermore, three factors were brought up that further refine the definition of nearby services:

- Customer group (what kind of possibilities for mobility the people have, what kind of service do they needs, what is their demographic / socioeconomic and medical status quo)
- Area (How is the area geographically? How is the population situated geographically? How good are the transportation connections? Is it urban/rural? Is it mainland or archipelago?)
- Service branch (has the service provision been defined in the Acts, and if so, to what extent?)

The accessibility criterion seems to be usually the most flexible one. However, according to experts it is usually accessibility what determines what is a local or nearby service. At the same time, it is recognized that the provision of nearby services will never be spatially equal. The urban and rural areas will always have a different position in the service networks – and the inhabitants in these areas have commonly very different expectations when considering nearby service accessibility. Rather the focus could be on how more people reach the necessary services without their own car?

5.5 Discussion

Based on the aforementioned Finnish and Swedish accessibility studies, similar accessibility studies have been conducted in the Nordic context. However, each study offers slightly different methodological approaches, particularly in terms of differentiation between types of health care locations. Indeed, it appears that our study in Iceland provides an in-depth approach relative to the previous analyses, and provides a good basis for understanding point-based, local and regional differences in accessibility to different types of health service locations. In the future, a Nordic benchmarking of accessibility using a consistent method would appear to be of great benefit. Yet, even though other concrete accessibility studies do exist in the other Nordic Countries, policy statements, legislation and spatial guidelines seem to unanimously deal with the issue of good accessibility in an open and vague manner, not wanting to set specific accessibility threshold that must be unanimously adhered to. Thus statements such as “all residents should have good access to health care” prevail over concrete policy statements such as “all residents should be located within x minutes driving distance from a doctor or emergency care.”

A second observation is particularly relevant for Iceland’s current discussion on the spatial distribution of health services. While the issue of rurality and peripheral communities having low access to a range of basic services is perhaps foremost in Iceland compared to Sweden Finland, Denmark and Norway, each of these countries are dealing with same types of issues. Again, health service provision through internet and telephone, digitization of medical records and air transport are common in the country profiles. Likewise, reference to the experiences in other Nordic countries can offer a knowledge base for proceeding with potential spatial changes and health care governance reforms in Iceland. Likewise, a basic observation using the experiences of the other Nordic Countries are that distinctions between primary and specialized care are required, including potential differences in the level of government responsible for administering such services. Also, it is likely not going to be possible to make pronounced changes to the distribution of specialized services, whereby hospitals at the forefront of medical service provision and innovation will centralized in the most populated areas. As a result, focus may be placed on innovative solutions for responding to medical needs in rural and peripheral locations, especially focussing on elderly care, as well as investment in efficient means of patient transport, particularly in terms of aircraft and helicopter.

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