REGIONAL DIFFERENCES IN HOSPITAL UTILIZATION IN ICELAND 2008–2012

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Background

Reducing health inequalities across geographic regions is an important aim for improving health (1, 2). Previous studies in Iceland show;

1. Lower prevalence of several diagnosed chronic diseases, including cardiovascular disease, in regions outside the Capital Region (CR) while poorer self-rated health in the same areas (3).

2. Lower prevalence of diagnosed gestational diabetes and hypertension as well as congenital malformations outside the CR (4).

With the motivation to support evidence-based spatial organization of health care the aim of this study is to explore potential differences in hospital service utilization, focusing on cardiovascular disease, by geographic regions in Iceland.

Study Area

Iceland. Population approx. 320,000. Iceland is divided into seven health regions which serve as a foundation for the organization of general health services (Figure 1). The seven regions differ greatly in size and population. The Capital Region of Reykjavik in SW Iceland covers the smallest area in square kilometers but contains 2/3 of the total population (5).
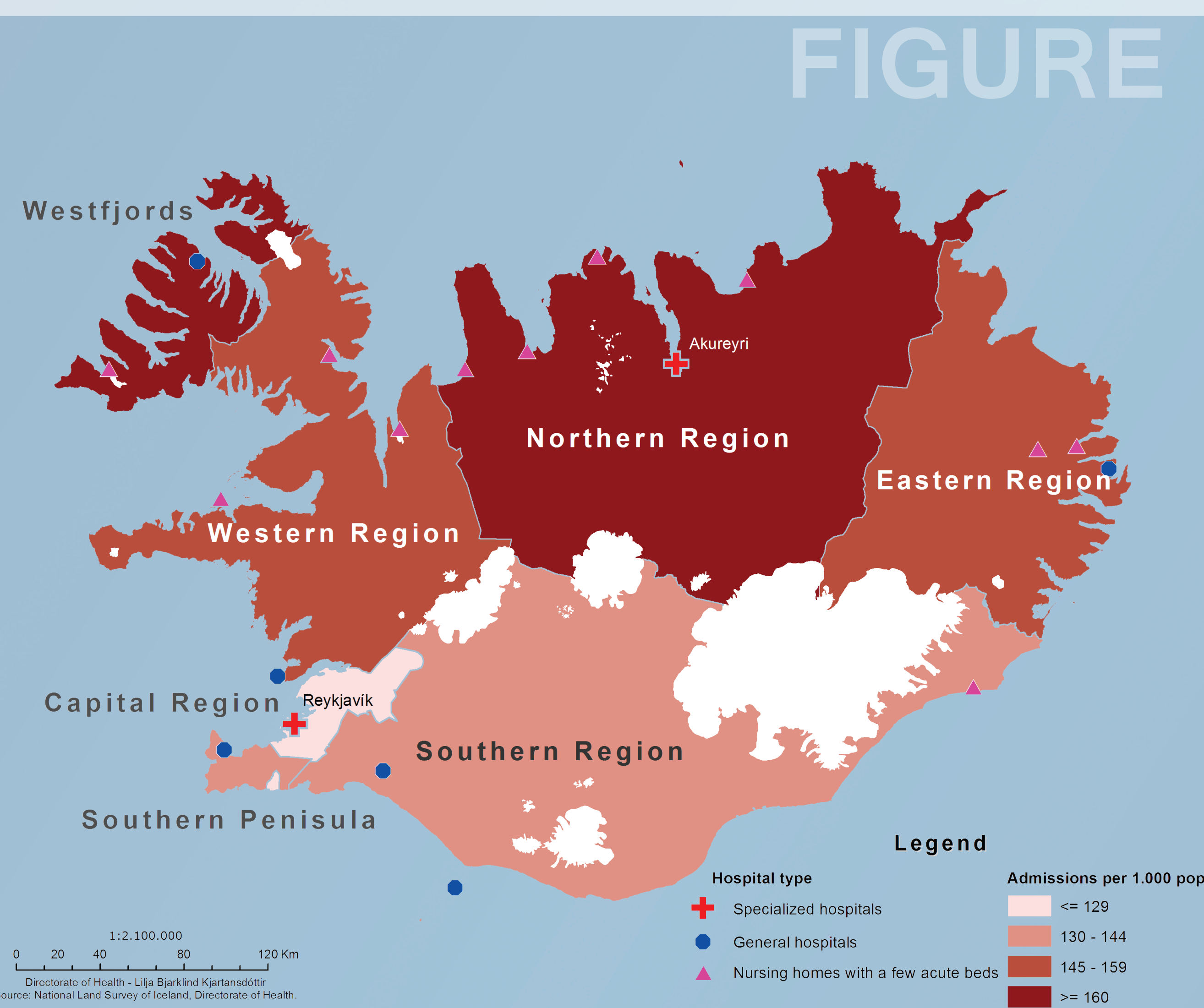
Material & Methods

- Standardized data on every hospital admission in Iceland from the National Patient Register.
- Admissons under 90 days 2008–2013 included in analysis (n=266803).
- Data on: Institution, postal code, discharge diagnoses (ICD10) and operations (NCSP)

Residence was grouped in three ways;

1. Capital Region versus all other areas.
2. By distance from the CR.
3. By availability of local health services.

Logistic regression was used to explore differences in outcomes by area of residence while controlling for potential confounding variables. Odds ratios and 95 percent confidence intervals (95% CI) were calculated.

All hospital admissions of residents in each health district
per 1.000 pop. 2012, irrespective of admitting hospital

FIGURE 1

Westfjords
Akureyri
Northern Region
Eastern Region
Western Region
Capital Region — Reykjavik
Southern Region
Southern Penisula

Legend
Hospital type
+ Specialized hospitals
● General hospitals
▲ Nursing homes with a few acute beds

Admissions per 1.000 pop.
<= 129
130 - 144
145 - 159
>= 160

1:2.100.000
0   20   40   80   120 Km

Directorate of Health - Lilja Bjarkind Kjartansdottir
Source: National Land Survey of Iceland, Directorate of Health.

Discussion

The higher hospital admission rates in general among residents outside the CA may reflect poorer health or poorer availability of specialized outpatient health services in this population.

Alternatively, long distances to local health service providers might promote inpatient services for rural patients where they can be easily observed.

The observed regional differences in hospital admission due to selected cardiovascular disease will be explored further.

Preliminary results

The total annual number of hospital admissions, irrespective of the admitting hospital in 2012 was 119 admissions per 1.000 population residing in the CR but 158 admissions per 1.000 population residing outside the CR (risk difference of 39 per 1000) (Figure 1).

When age, gender and cohabitation have been taken into account, preliminary results show:

- Residents in the CR are more likely to have been admitted to hospitals due to acute myocardial infarction, angina and heart failure than residents outside the CR (Table 1).

- Residents outside the CR were, however, more likely to have been admitted to a hospital due to atrial fibrillation, hypertension and stroke (Table 1).

- The highest odds of being admitted with either atrial fibrillation or hypertension were in areas with some but limited specialised hospital services (Table 2).

Table 1. Hospital admissions for selected diseases[1] 2008-2013 by pt´s residence

	Capital Region (CR)		Outside CR	
	%	N	%	N
Stroke (I64)	0.2	(215)	0.3	(294)
aOR	1.0		1.63 (1.36-1.94)*	
Acute myocardial infarction (I21-I22)	1.0	(1495)	1.0	(1124)
aOR	1.0		0.87 (0.81-0.94)*	
Atrial fibrillatio (I48)	0.9	(1314)	1.2	(1367)
aOR	1.0		1.21 (1.12-1.31)*	
Heart failure (I50)	1.1	(1772)	0.9	(1023)
aOR	1.0		0.69 (0.63-0.74)*	
Hypertension (I10-I13)	0.2	(338)	0.5	(538)
aOR	1.0		1.96 (1.71-2.25)*	
Angina (I20)	0.7	(1953)	0.5	(1307)
aOR	1.0		0.76 (0.71-0.81)*	

[1] Main discharge diagnosis, ICD10
aOR, odds ratio adjusted for age, gender and cohabitation
*aOR significantly different from 1.0; 0.95% CI

Table 2. Hospital admissions for selected diseases[1] 2008-2013 by level of health service[2] in pt´s local neighbourhood

	Diverse specialized services		Limited specialized services		General health centres only		No local health services	
	%	N	%	N	%	N	%	N
Stroke (I64)	0.1	(231)	0.3	(100)	0.3	(86)	0.3	(92)
aOR	1.0		1.72 (1.36-2.18)*		1.82 (1.42-2.34)*		1.77 (1.39-2.26)*	
Acute myocardial infarct (I21-I22)	1.0	(1647)	1.1	(407)	1.0	(275)	0.9	(290)
aOR	1.0		1.01 (0.91-1.13)		0.84 (0.73-0.95)*		0.80 (0.70-0.91)*	
Atrial fibrillatio (I48)	0.9	(1518)	1.4	(505)	1.1	(316)	1.1	(342)
aOR	1.0		1.36 (1.23-1.50)*		1.04 (0.92-1.18)		1.04 (0.92-1.17)	
Heart failure (I50)	1.1	(1809)	0.9	(337)	1.2	(329)	0.8	(270)
aOR	1.0		0.75 (0.66-0.84)*		0.90 (0.80-1.02)		0.69 (0.61-0.79)*	
Hypertension (I10-I13)	0.2	(385)	0.7	(272)	0.4	(116)	0.3	(103)
aOR	1.0		2.98 (2.56-3.48)*		1.61 (1.31-1.99)*		1.33 (1.07-1.65)*	
Angina (I20)	1.2	(2115)	1.2	(441)	1.1	(320)	1.2	(384)
aOR	1.0		0.84 (0.76-0.93)*		0.74 (0.66-0.84)*		0.80 (0.72-0.90)*	

[1] Main discharge diagnosis, ICD10
[2] Categorization of local health service is based on data from the Directorate of Health and the Ministry of Health.
aOR, odds ratio adjusted for age, gender and cohabitation
*aOR significantly different from 1.0; 0,95% CI

TABLE 1 TABLE 2 TABLE

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