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Differences in medical services in Nordic general practice: a comparative survey from the QUALICOPC study

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ABSTRACT

Objective: We aim to describe medical services provided by Nordic general practitioners (GPs), and to explore possible differences between the countries.

Design and setting: We did a comparative analysis of selected data from the Nordic part of the study Quality and Costs of Primary Care in Europe.

Subjects: 875 Nordic GPs (198 Norwegian, 80 Icelandic, 97 Swedish, 212 Danish and 288 Finnish) answered identical questionnaires regarding their practices.

Main outcome measures: The GPs indicated which equipment they used in practice, which procedures that were carried out, and to what extent they were involved in treatment/follow-up of a selection of diagnoses.

Results: The Danish GPs performed minor surgical procedures significantly less frequent than GPs in all other countries, although they inserted intrauterine devices significantly more often than GPs in Iceland, Sweden and Finland. Finnish GPs performed a majority of the medical procedures more frequently than GPs in the other countries. The GPs in Iceland reported involvement in a more narrow selection of conditions than the GPs in the other countries. The Finnish GPs had more advanced technical equipment than GPs in all other Nordic countries.

Conclusion: GPs in all Nordic countries are well equipped and offer a wide range of medical services, yet with a substantial variation between countries. There was no clear pattern of GPs in one country doing consistently more procedures, having consistently more equipment and treating a larger diversity of medical conditions than GPs in the other countries. However, structural factors seemed to affect the services offered.

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General practice; organisation and administration; Nordic countries; diagnosis; equipment; procedures; QUALICOPC

Background

General practitioners (GPs) are usually considered key service providers in primary care [1]. There is varying organisation of general practice both within and between countries, and the organisational framework is of significance to the services offered [2–4]. Available appropriate medical equipment is positively correlated with the quality of medical performance [5], and GPs with good access to basic diagnostic tests both diagnose, treat and refer patients more appropriately [6].

In 1993, the European Task Profile Study investigated service provision for GPs in 30 European countries [2]. Finland and Iceland scored higher than the Scandinavian countries when it came to application of medical techniques and procedures. With regard to comprehensive disease management in Nordic general practice, Norway scored highest and Finland scored lowest. Norwegian GPs' available equipment was described in an extensive report from 1981 [7], but both the organisation of the primary health care system and the available diagnostic and therapeutic equipment have changed significantly since then. A study from 2001 explored differences in consultation rates and diagnoses given by Nordic GPs [8]. Some more recent studies from other European countries describe the spectrum of medical equipment in the respective countries [9,10]. It remains unknown how

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this compares to the situation in the Nordic countries. Updated and systematic knowledge about available technical equipment, tests, medical procedures and conditions primarily handled in Nordic general practices is needed.

Health systems in the Nordic countries

The Nordic countries (Norway, Denmark, Finland, Sweden and Iceland) have comparable political structures and health care systems are based on the Nordic welfare model, aiming for equal access to health care services for all residents. However, when it comes to primary care and general practice, there are important organisational differences (Textbox 1).

Aim

The aim of this study is to describe services provided by Nordic GPs in terms of available diagnostic and therapeutic equipment, tests and procedures in the GPs' offices. We also aim to describe differences between Nordic GPs' clinical involvement in treatment and follow-up for a selection of diagnoses.

Materials and methods

Our material originates from the study Quality and Costs of Primary Care in Europe (QUALICOPC) [11]. A set of four questionnaires was developed by the QUALICOPC Partner Consortium, led by the Netherlands Institute for Health Services Research. The construction of the questionnaires, as well as a detailed account of their contents, is extensively described elsewhere [12], as are the details concerning the implementation of the QUALICOPC study [11]. The development of the questionnaires was based on existing, validated questionnaires. Participating GPs completed a questionnaire reporting information about their individual practices.

Sample

In Sweden and Denmark, random national samples of GPs were invited to participate. In Iceland, the entire GP population was invited. In Finland, there was a mixed procedure of random sampling plus selected GPs. In Norway, there was convenience sampling within formal and informal GP networks. Based on calculations in previous research [11], the study aimed to realise a response of 220 GPs from each participating country except Iceland (aim 75 GPs). Inclusion stopped when a satisfying number of responders were reached, or when no further recruitment was considered feasible. In Denmark and Norway, the GPs received an economic incentive for participation, and in Iceland participants were invited to a seminar [13]. In Sweden and Finland, no incentives for participation were offered. All questionnaires were answered anonymously. Data collection took place from 2011 to 2013.

Measures

We recorded the following demographic variables: GP's gender and age, solo or partnership practice, whether the GPs were self-employed or employees, and size of patient list. The GPs estimated how many

Textbox 1. Organisation of general practice in the Nordic countries.

	GP employment	Patient affiliation	Patient co-payment	Gate-keeping
Norway 5.2 mill inhab GDP €49,200 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for-service.	Individual patient list system. All inhabitants are assigned to or choose a regular GP.	Co-payment for adults ≥16 years.	For all specialities
Sweden 9.8 mill inhab GDP €32,700 (2013)[a]	Mostly employees in public (60%) or private health centres.	All patients can register with a primary care centre (some centres offer registering with a specific GP).	Co-payment for adults ≥20 years.	No
Denmark 5.6 mill inhab GDP €32,100 (2013)[a]	Mostly self-employed. Receive a combination of capitation fee and fee-for-service.	Patients listed with a general practice. 1% are not listed (group 2-insured)	No co-payment (group 2-insured pay part of the fee and have free choice of GP).	For most specialities. Patients can contact ophthalmologists and ear-nose-throat specialists directly.
Finland 5.4 mill inhab GDP €37,559 (2014)[a]	Mostly employees in public/ private health centres or in occupational health care	Patient affiliation with public health centres or occupational health care centres. Partly subsidised private services also available.	Co-payment for adults ≥18 years in public health centres, variations between municipalities. No co-payment in occupational health care.	Referral is needed for specialist consultations through the public health system. Self-paying patients can contact all private specialists directly.
Iceland 329,100 inhab. GDP €30,000 (2013)[a]	Mostly employees in public health centres.	Patient affiliation with health centres.	Co-payment for adults ≥18 years. Reduced co-payment >67 years.	No

[a]Information from the Nordic co-operation www.norden.org/en/fakta-om-norden-1/the-nordic-countries-the-faroe-islands-greenland-and-aaland (January 2017).

face-to-face patient contacts they had on a normal working day, usual length of a consultation in their office, and the distance to the nearest hospital.

The GPs indicated from predefined lists which equipment was in use by themselves or their staff, which procedures that were carried out by themselves or their staff as opposed to referring to secondary care specialists, and to what extent they were involved in the treatment and follow-up of patients with a listed selection of diagnoses. The eligible selection of equipment, procedures and diagnoses is indicated in Tables 2–4. All questions focused on regular practice and not the situation in out-of-hours care.

The GPs were given four possible answers concerning to what extent they performed the indicated procedures, and to what extent they were involved in treatment and follow-up of the given diagnosis: (1) (Almost) always, (2) Usually, (3) Occasionally and (4) Seldom/never. These were merged into two categories during analysis: always/usually (1 + 2) and occasionally/never (3 + 4).

Statistics

We present descriptive statistics with numbers, per cent, min–max intervals and 95% confidence intervals (95% CI). To identify differences between countries, we used binary logistic regression adjusting for GPs' sex and age, number of consultations per day and distance to the nearest hospital. We compared each country to all other countries in four separate regression models. To adjust for this multiple testing, we used the Bonferroni correction, giving a significance level of $p \leq .0125$ for the logistic regression analyses. For all other analyses, the significance level was set to $p \leq .05$. Odds ratios (OR) are given with 95% CI. Analyses were done in IBM SPSS Statistics 22 (Armonk, NY).

Results

Demographics

Responses from 875 Nordic GPs (Norway 198, Sweden 97, Denmark 212, Finland 288, Iceland 80) were included in the analyses. Characteristics of the GPs are found in Table 1.

Medical equipment

Table 2 shows details concerning the equipment available to the GPs. Basic medical equipment was available in virtually all practices. A selection of point-of-care laboratory equipment was available in all countries, but the details vary. In Iceland, hardly any of the GPs had a coagulometer (3.8%), and this was also less common in Finland (26.8%) than in the other countries. In Norway and Denmark, cholesterol meters were uncommon (respectively, 9.6% and 3.8%).

Basic technical equipment like blood pressure monitors and otoscopes was available in more than 92% of GP practices in all countries. Electrocardiographs were present in more than 95% of all practices in all countries except Denmark (83%). More advanced technical equipment was almost exclusively present at Finnish GPs' offices: X-ray (62.7%), gastroscope (29.2%), sigmoidoscope (29.2%) and bicycle ergometer (31%). Abdominal ultrasound was available for over 50% of Finnish GPs, whereas only 4% of the Swedish GPs had this equipment. Microscopes were present in 62–73% of practices in all countries except Finland (23%). Defibrillators were very common in Sweden (96.9%), Finland (95.7%) and Iceland (96.3%), less so in Denmark (37.3%) and Norway (65.2%).

Treatment and follow-up of patients with listed diagnoses

The GPs indicated from a predefined list the different medical conditions in which they always or usually were involved in treatment and/or follow-up (Table 3).

Association with demographic factors (crude numbers, not shown in table): GPs with practices located ≤20 km from the nearest hospital were less likely to be involved in the treatment and follow-up of Parkinson's disease, OR 0.6 (0.4–0.8); peritonsillar abscess, OR 0.6 (0.4–0.8) and myocardial infarction, OR 0.6 (0.4–0.9). Male GPs were more likely than female GPs to be

Table 1. Demographics of participating GPs in the Nordic part of the QUALICOPC study.

	Norway	Denmark	Sweden	Finland	Iceland
Total N	198	212	97	288	80
Female (%)	39	43	55	71	28
Age mean (range)	45.7 (28–69)	53.1 (35–76)	52 (34–69)	45 (25–70)	54.5 (33–68)
Practices with distance to hospital >20 km (%)	28	20	33	32	12
Share practice with other GPs (%)	99	72	99	65	98
Self-employed (%)	93	99	14	5	9
Number of consultations per day[a] Mean (range)	19 (2–30)	23.8 (12–40)	13 (7–25)	12.7 (2–40)	13.2 (7–25)
Duration of regular consultation in minutes[a] Mean (range)	18.6 (10–30)	14.3 (7–20)	24.1 (15–30)	23.9 (10–60)	19.3 (10–30)

[a]Estimated by the GPs.

Table 2. Medical equipment in GP practices in the Nordic countries.[a]

	Norway $N = 198$ GPs		Sweden $N = 97$ GPs		Denmark $N = 212$ GPs		Finland $N = 288$ GPs		Iceland $N = 80$ GPs	
Equipment	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Hemoglobinometer	195	98.5	95	97.9	201	94.8	235	82.7	68	85.0
Blood glucose test	197	99.5	93	95.9	205	96.7	274	96.5	75	93.8
Cholesterol meter	19	9.6	31	32.0	8	3.8	108	38.0	19	23.8
Blood cell counter	81	40.9	33	34.0	36	17.0	106	37.3	19	23.8
Ophthalmoscope	197	99.5	79	81.4	131	61.8	275	96.8	61	76.3
Proctoscope	153	77.3	97	100.0	76	35.8	261	91.9	42	52.5
Otoscope	198	100.0	96	99.0	210	99.1	277	97.5	74	92.5
Gastroscope	2	1.0	0	0.0	1	0.5	83	29.2	1	1.3
Sigmoidoscope	7	3.5	5	5.2	0	0.0	83	29.2	11	13.8
X-ray	11	5.6	3	3.1	0	0.0	178	62.7	8	10.0
Ultrasound	33	16.7	4	4.1	24	11.3	164	57.7	10	12.5
Microscope	125	63.1	61	62.9	153	72.2	64	22.5	58	72.5
Audiometer	89	44.9	71	73.2	118	55.7	234	82.4	73	91.3
Bicycle ergometer	4	2.0	7	7.2	1	0.5	88	31.0	6	7.5
Eye tonometer	160	80.8	36	37.1	3	1.4	259	91.2	36	45.0
Peak flow meter	161	81.3	94	96.9	204	96.2	280	98.6	67	83.8
Spirometer	197	99.5	95	97.9	206	97.2	188	66.2	79	98.8
Electrocardiograph	196	99	97	100.0	175	82.5	270	95.1	80	100.0
Blood pressure monitor	197	99.5	96	99.0	209	98.6	283	99.6	80	100.0
Infusion set	116	58.6	64	66.0	86	40.6	253	89.1	71	88.8
Doctor's bag	167	84.3	94	96.9	208	98.1	180	63.4	78	97.5
Urine catheter	179	90.4	91	93.8	186	87.7	266	93.7	61	76.3
Coagulometer	134	67.7	60	61.9	157	74.1	76	26.8	3	3.8
Set for minor surgery	194	98.0	95	97.9	206	97.2	269	94.7	72	90.0
Suture set	195	98.5	96	99.0	210	99.1	278	97.9	77	96.3
Defibrillator	129	65.2	94	96.9	79	37.3	269	95.7	77	96.3
Disposable syringes	195	98.5	94	96.9	210	99.1	279	98.2	80	100.0
Disposable gloves	198	100.0	96	99.0	211	99.5	280	98.6	80	100.0
Refrigerator for medicines	198	100.0	96	99.0	212	100.0	279	98.2	79	98.8
Resuscitation equipment	166	83.8	84	86.6	193	91.0	270	95.1	76	95.0

[a]Question: Please tick the equipment used in your practice by yourself or your staff.

involved in the treatment of peritonsillar abscess, OR 1.4 (1.4–2.0); Parkinson's disease, OR 2.1 (1.5–2.9); rheumatoid arthritis, OR 1.5 (1.1–2.1) and myocardial infarction, OR 1.5 (1.02–2.1).

Differences on country level: Differences between countries are shown in Table 4. Between 95% and 100% of the GPs in all five countries indicated that they were involved in treatment or follow-up of chronic obstructive pulmonary disease, pneumonia and type-2 diabetes.

Icelandic GPs were significantly less involved in the treatment of myocardial infarction, heart failure and peritonsillar abscesses than the GPs in all other countries. The Norwegian and Finnish GPs were significantly more involved in the treatment of rheumatoid arthritis than the GPs in the other countries. Norwegian GPs were significantly more involved in the treatment of Parkinson's disease than GPs in Denmark and Iceland.

Procedures

The procedures performed by the GPs are shown in Table 3.

Association with demographic factors (crude numbers, not shown in table): The following procedures were carried out less frequently when the distance to hospital was $\leq$20 km compared to $>$20 km: wound sutures, OR 0.2 (0.1–0.5); removal of sebaceous cysts, OR 0.5 (0.3–0.7); insertion of intrauterine devices (IUDs), OR 0.5 (0.3–0.8); joint injections, OR 0.4 (0.3–0.6); strapping of ankle, OR 0.6 (0.4–0.9) and intravenous infusion, OR 0.3 (0.2–0.5).

Male GPs inserted IUDs less often than female GPs, OR 0.4 (0.3–0.6). However, wound sutures, OR 1.67 (1.1–6.7); wedge resection of toe nails, OR 2.2 (1.4–3.3); removal of sebaceous cyst, OR 1.8 (1.3–2.6); wart excisions, OR 1.5 (1.1–2.0); fundoscopy, OR 1.5 (1.02–2.2); strapping of ankles, OR 1.5 (1.04–2.04) and joint injections, OR 1.9 (1.3–2.8) were done significantly more often by male GPs.

Differences on country level: Table 5 shows the inter-country differences in performed procedures. Danish and Norwegian GPs were significantly more likely to insert IUDs than GPs in all other countries. Danish GPs did removal of sebaceous cysts, wedge resection of toenails, fundoscopy and intravenous infusion less often than GPs in all other countries, and less wound sutures than GPs in Iceland and Finland. Finnish GPs

Table 3. Number and valid percentages (95% CI) of GPs who reported that they usually or always performed the listed procedures, or were involved in treatment/follow-up of the listed diagnoses.

	Norway N = 198			Sweden N = 97			Denmark N = 212			Finland N = 288			Iceland N = 80		
	n	%	95% CI	*n*	%	95% CI	*n*	%	95% CI	*n*	%	95% CI	*n*	%	95% CI
Procedures[a]															
Wedge resection	127	64.1	57–71	91	94.8	91–99	36	17.2	12–22	257	91.5	89–95	69	86.3	78–94
Wound suturing	186	94.4	91–97	95	99.0	97–100	141	66.8	61–73	258	91.8	89–95	60	75.0	78–94
Removal sebaceous cyst	144	73.1	67–79	84	87.5	81–95	118	55.9	49–63	226	80.4	75–85	52	66.7	57–77
Excision wart	163	82.3	77–87	30	31.9	23–41	135	64.0	58–70	175	62.9	57–69	64	81.0	72–90
Insertion IUD	177	89.8	86–94	19	19.8	12–28	182	86.3	81–91	195	69.6	65–75	10	12.5	6–20
Fundoscopy	151	76.3	70–82	53	55.8	46–66	10	4.7	2–8	206	73.3	68–78	21	26.3	16–36
Joint injection	109	55.1	48–62	87	90.6	85–97	106	50.2	43–57	267	95.7	94–98	61	7.2	68–86
Strapping ankle	80	40.4	33–47	83	86.5	80–94	169	80.1	75–85	203	72.5	68–78	52	65.8	56–76
Cryotherapy warts	167	84.3	79–89	14	14.7	8–22	141	66.8	61–73	153	54.4	48–60	76	95.0	90–100
IV infusion	52	26.4	20–32	37	38.9	29–49	7	3.3	1–5	178	63.3	57–69	21	26.6	17–37
Diagnoses[b]															
Bronchitis	194	99.0	98–100	96	100.0	NA	209	99.1	98–100	269	95.4	92–98	77	96.3	92–100
Pneumonia	195	99.5	98–100	96	100.0	NA	212	100.0	NE	249	88.9	85–93	77	100.0	NA
Myocardial Infarction	172	87.8	83–93	78	81.3	73 - 89	163	76.9	71–83	205	73.0	68–78	38	47.5	37–59
Heart failure	183	93.4	89–97	94	98.9	97–100	199	94.3	91–97	266	94.3	91–97	57	71.3	61–81
Rheumatoid arthritis	195	99.0	98–100	68	70.8	62–80	139	65.6	60–72	230	81.6	77–87	45	56.3	45–67
Parkinson's disease	153	78.1	72–84	58	61.1	51–71	134	63.5	58–70	185	65.8	61–71	25	31.3	21–41
Diabetes type 2	197	100.0	NA	96	100.0	NA	210	100.0	NA	266	94.3	91–97	78	98.7	97–100
Peptic ulcer	183	93.4	91–97	92	95.8	92–100	203	95.8	93–99	239	84.8	81–89	66	82.5	75–91
Disc herniation	195	99.5	98–100	95	99.0	97–100	209	98.9	98–100	251	89.0	85 - 93	80	100.0	NA
Depression	195	99.0	98–100	95	99.0	97–100	210	99.1	98–100	259	91.8	89–95	79	98.8	97–100
Hordeolum	166	84.7	80–90	87	90.6	85–97	201	94.8	92–98	213	75.8	71–81	77	96.3	92–100
Peritonsillar abscess	117	60.3	53–67	59	61.5	52–72	167	78.8	74–84	179	63.5	58–70	22	27.8	18–38

NA: not applicable due to separation of the material.
[a]Question: To what extent are the following activities carried out in your practice population by you (or your staff) and not by a medical specialist (practice population means: people who normally apply to you for primary medical care)?
[b]Question: To what extent are you involved in the treatment and follow-up of patients in your practice population with the following diagnoses?

administrated intravenous infusion more frequently than GPs in any of the other countries.

Discussion

We found several differences between the services provided by GPs in the Nordic countries. Danish GPs performed several procedures significantly less frequent than GPs in all other countries, although they inserted IUDs significantly more often than GPs in Sweden, Iceland and Finland. Finnish GPs performed a majority of the medical procedures more frequently than GPs in the other countries. GPs in Iceland reported involvement in a more narrow selection of the medical conditions than GPs in the other countries. Finnish GPs had more advanced technical medical equipment than GPs in all other countries.

It was otherwise difficult to identify obvious patterns in the differences between the countries; there was no clear indication of GPs in one country doing consistently more procedures, having consistently more equipment and treating a larger diversity of medical conditions than GPs in the other countries.

Strengths and weaknesses

Our material allows for international comparison, as we used the same questionnaire in all countries during the same period. In Norway, Finland, Denmark and Iceland, GPs were recruited nationwide. The distribution of the GPs' age and gender was representative for the countries [13].

Finland and Iceland obtained the required number of GPs, whereas Norway obtained 90% and Denmark 96%. This was deemed sufficient for use in statistical analysis. In Sweden, only 97 GPs (44% of goal) took part in the study, in spite of several reminders. The Swedish results must therefore be interpreted with care.

The questionnaires were designed and validated for an international study [12]. Thus, the questions were not specifically designed to map general practice in the Nordic countries. For Nordic circumstances, some of the items in the predefined tick-off lists may be construed as redundant or irrelevant (e.g. disposable gloves, refrigerator), whereas others were missed (e.g. dermatoscope, CRP measurement).

We used distance to hospital as a marker of an urban/rural location. However, in the QUALICOPC questionnaire, '>20 km to the nearest hospital' was

Table 4. Associations [odds ratio (95% CI)] between country and treatment/follow-up of different diagnoses.

Model	Bronchitis	Pneumonia	Myocardial Infarction	Heart failure	Rheumatoid arthritis	Parkinson's disease	Diabetes type 2	Peptic ulcer	Disc herniation	Depression	Hordeolum	Peritonsillar abscess
1. Ref Norway												
Sweden	NA	NA	0.8 (0.4–1.6)	9.2 (1.1–75.1)	**0.3 (0.2–0.6)**	0.5 (0.3–1.0)	NA	1.9 (0.6–6.4)	0.5 (0.03–9.1)	0.9 (0.1–10.6)	1.8 (0.08–4.2)	1.1 (0.7–2.0)
Denmark	0.9 (0.1–7.1)	NA	0.6 (0.3–1.0)	0.9 (0.4–2.1)	**0.2 (0.1–0.4)**	**0.5 (0.3–0.8)**	NA	1.1 (0.4–2.8)	0.4 (0.04–4.0)	1.2 (0.2–8.8)	**3.0 (1.4–6.4)**	**2.8 (1.7–4.5)**
Finland	0.4 (0.1–2.1)	0.1 (0.01–0.9)	**0.4 (0.3–0.8)**	2.0 (0.8–4.7)	0.7 (0.4–1.2)	0.7 (0.5–1.2)	NA	0.6 (0.3–1.3)	**0.04 (0.01–0.4)**	**0.1 (0.02–0.5)**	0.6 (0.4–1.1)	1.3 (0.8–2.0)
Iceland	0.7 (0.1–6.2)	NA	**0.2 (0.1–0.3)**	**0.2 (0.1–0.5)**	**0.2 (0.1–0.3)**	**0.1 (0.1–0.3)**	NA	0.3 (0.1–0.9)	NA	0.7 (0.1–7.9)	4.4 (1.3–15.6)	**0.3 (0.2–0.5)**
2. Ref Finland[a]												
Sweden	NA	NA	1.7 (0.9–3.1)	4.7 (0.6–36.4)	**0.5 (0.3–0.8)**	0.7 (0.4–1.2)	NA	3.3 (1.1–9.5)	12.2 (1.6–92.3)	8.9 (1.2–68.5)	**2.9 (1.3–6.1)**	0.9 (0.6–1.5)
Denmark	2.3 (0.3–16.1)	NA	1.3 (0.7–2.3)	0.5 (0.2–1.3)	**0.3 (0.2–0.5)**	0.7 (0.4–1.2)	NA	1.9 (0.7–5.2)	**9.0 (2.0–40.8)**	**11.5 (2.0–64.8)**	**4.7 (2.0–10.8)**	**2.2 (1.3–3.9)**
Iceland	2.0 (0.4–9.8)	NA	**0.4 (0.2–0.6)**	**0.1 (0.1–0.3)**	**0.2 (0.1–0.4)**	**0.2 (0.1–0.3)**	4.7 (0.5–40.1)	0.6 (0.3–1.2)	NA	6.6 (0.8–53.2)	**7.0 (2.1–23.6)**	**0.2 (0.1–0.4)**
3. Ref Denmark[b]												
Sweden	NA	NA	1.4 (0.7–2.8)	10.5 (1.2–92.1)	1.6 (0.8–3.1)	1.1 (0.6–2.0)	NA	1.7 (0.4–6.6)	1.4 (0.1–15.3)	0.8 (0.1–10.1)	0.6 (0.2–1.7)	**0.4 (0.2–0.8)**
Iceland	0.9 (0.1–7.8)	NA	**0.3 (0.1–0.6)**	**0.3 (0.1–0.7)**	0.8 (0.4–1.5)	**0.3 (0.1–0.5)**	NA	0.3 (0.1–0.9)	NA	0.6 (0.1–7.4)	1.5 (0.4–6.0)	**0.1 (0.1–0.2)**
4. Ref Sweden[c]												
Iceland	NA	NA	**0.2 (0.1–0.4)**	**0.02 (0.0–0.2)**	0.5 (0.3–0.9)	**0.3 (0.1–0.5)**	NA	**0.2 (0.1–0.6)**	NA	0.7 (0.04–12.3)	2.5 (0.6–9.5)	**0.2 (0.1–0.5)**

NA: Not applicable due to separation of the material.
Bold figures: $p \leq .0125$.
Logistic regression adjusted for GP sex, age, number of consultations per day and distance to hospital.
[a]Comparison with Norway in model 1.
[b]Comparisons with Norway and Finland in models 1 and 2.
[c]Comparisons with Norway, Finland and Denmark in models 1, 2 and 3.

Table 5. Associations [odds ratio (95% CI)] between country and procedures performed by the GPs or their staff.

Model	Suture	IUD	Fundoscopy	Joint injection	Strapping of ankle	Cryotherapy of warts	Intravenous infusion	Wedge resection toenail	Removal of sebaceous cyst	Wart excision
1. Ref Norway										
Sweden	NA	**0.02 (0.01–0.1)**	**0.3 (0.2–0.6)**	**11.6 (5.1–26.3)**	**11.5 (5.6–23.8)**	**0.04 (0.02–0.1)**	1.6 (0.9–3.0)	**14.9 (5.4–41.0)**	**3.9 (1.8–8.4)**	**0.2 (0.1–0.3)**
Denmark	0.1 (0.0–0.2)	0.6 (0.3–1.2)	**0.01 (0.0–0.02)**	0.7 (0.4–1.1)	**5.2 (3.2–8.5)**	**0.3 (0.2–0.6)**	**0.1 (0.04–0.2)**	**0.09 (0.1–0.2)**	**0.4 (0.2–0.6)**	**0.3 (0.2–0.4)**
Finland	1.2 (0.5–2.8)	**0.2 (0.1–0.4)**	1.1 (0.7–1.8)	**32.1 (15.4–66.7)**	**5.2 (3.2–8.4)**	**0.3 (0.2–0.4)**	**5.1 (3.1–8.4)**	**10.7 (5.7–19.9)**	**2.6 (1.5–4.3)**	0.7 (0.4–1.2)
Iceland	0.3 (0.1–0.8)	**0.02 (0.01–0.1)**	**0.1 (0.04–0.2)**	**4.4 (2.2–9.0)**	**3.1 (1.7–5.8)**	**8.3 (1.9–36.4)**	1.1 (0.6–2.2)	**4.8 (2.2–10.8)**	0.9 (0.5–1.8)	1.5 (0.7–3.1)
2. Ref Finland[a]										
Sweden	NA	**0.1 (0.1–0.2)**	**0.3 (0.2–0.5)**	0.4 (0.1–0.9)	2.2 (1.1–4.3)	**0.2 (0.1–0.3)**	**0.3 (0.2–0.5)**	1.4 (0.5–3.8)	1.5 (0.8–3.1)	**0.2 (0.1–0.4)**
Denmark	**0.1 (0.03–0.2)**	**2.7 (1.4–5.4)**	**0.01 (0.0–0.02)**	**0.02 (0.01–0.1)**	1.0 (0.6–1.8)	1.3 (0.8–2.2)	**0.02 (0.01–0.04)**	**0.01 (0.0–0.02)**	**0.1 (0.1–0.3)**[a]	**0.4 (0.2–0.7)**
Iceland	**0.3 (0.1–0.6)**	**0.1 (0.04–0.2)**	**0.1 (0.04–0.1)**	**0.1 (0.1–0.3)**	0.6 (0.3–1.1)	**31.2 (7.4–131.6)**	**0.2 (0.1–0.4)**	0.5 (0.2–1.0)	**0.4 (0.2–0.7)**	2.1 (1.1–4.1)
3. Ref Denmark[b]										
Sweden	NA	**0.04 (0.02–0.1)**	**36.9 (14.9–91.8)**	**16.9 (7.0–41.0)**	2.2 (1.0–4.9)	**0.1 (0.1–0.2)**	**19.1 (7.2–50.3)**	**174.9 (56.9–537.7)**	**11.3 (5.0–25.5)**	0.6 (0.3–1.1)
Iceland	**3.7 (1.7–8.2)**	**0.03 (0.01–0.1)**	**8.9 (3.5–23.0)**	**6.4 (3.0–13.9)**	0.6 (0.3–1.2)	**24.2 (5.5–106.1)**	**12.9 (4.7–35.5)**	**11.7 (6.7–20.6)**	**2.7 (1.3–5.3)**	**5.6 (2.6–12.0)**
4. Ref Sweden[c]										
Iceland	NA	0.9 (0.4–2.1)	**0.2 (0.1–0.5)**	0.4 (0.2–0.9)	**0.3 (0.1–0.6)**	**213.5 (46.7–976.8)**	0.7 (0.3–1.4)	0.3 (0.1–1.0)	**0.2 (0.1–0.5)**	**10.1 (4.8–21.3)**

NA: Not applicable due to separation of the material.
Bold figures: $p<.0125$.
Logistic regression adjusted for sex, age, number of consultations per day and distance to hospital.
[a]Comparison with Norway in model 1.
[b]Comparisons with Norway and Finland in models 1 and 2.
[c]Comparisons with Norway, Finland and Denmark in models 1, 2 and 3.

the maximum distance indicated. In a Nordic context, many practices will be situated considerably further away from a hospital. Our data give information about daytime general practice, the situation in out-of-hours care is not covered by our study. All information was based on the GPs self-reporting. We have no reason to believe that the differences are due to unreliable answers from the doctors.

Interpretation of results and comparison with other studies

In 2014, the Nordic Council of Ministers for Health and Social Affairs released a common strategy [14] that stressed the importance of working together to enhance quality and safety in health services. However, international comparisons of services can be challenging, as different countries have different allocation of tasks within the health care system.

In 1993, the European Task Profile Study investigated the range of services offered by GPs in 30 European countries, showing a strong position of primary care in the Scandinavian countries (Norway, Denmark and Sweden) [2]. When comparing data from 1993 with the QUALICOPC data from 2013, a relative increase in the GPs' participation in disease management was found in all the Nordic countries [3]. For performance of minor technical procedures, Iceland, Denmark and Finland showed a relative decrease in the same period, whereas there was an increase in Sweden and Norway.

Geographical location may affect the service provision in general practice. Lower referral rates in rural areas have previously been found in Canada [15], and the use of outpatient specialist care was lower in smaller and more distant municipalities' communities in Norway [16]. In Denmark, the distance to the nearest specialist or hospital is often considerably shorter than in sparsely populated areas such as large parts of Norway, Finland and Sweden. In areas with long travel-distance to the nearest specialist, it is likely that the GPs will offer more diagnostic and therapeutic procedures irrespective of remuneration systems. An association with distance to hospital was found for several procedures in our study.

In Denmark and Norway, fee-for-service remuneration (public reimbursement and, in Norway, patient co-payment) constitutes an estimated 70 of the direct income for the GPs [17,18]. The services offered by the GPs in these countries may be influenced by the remuneration for the procedures in relation to the GPs expenses. This may explain some of the differences seen in our study. Wedge resections of toenails were less commonly done in Norway and Denmark than in the other countries. Time-consuming surgical procedures may be deprioritised if not considered sufficiently reimbursed.

Some differences in equipment can be explained by organisational variations. The Finnish GPs had a rather different profile than the other countries, with high availability of advanced technical equipment. This may in part be because some Finnish health centres used to be small local hospitals, and as such have a tradition of offering more specialised services. Still, only 66% of the Finnish GPs had spirometers, whereas this was available to more than 95% of GPs in all other countries. The service is in Finland traditionally offered in other locations than the primary care centres. In Denmark, only 1% of the GPs had eye tonometers, probably reflecting that the Danish patients can go directly to the ophthalmologist without referral.

In our results, we see a possible effect of gate-keeping. In Iceland, where there is effectively no gate-keeping, the GPs treated conditions such as rheumatoid arthritis, Parkinson's disease, heart failure and myocardial infarction significantly less often than in the other Nordic countries. We assume that Icelandic patients with these conditions are followed by relevant specialists.

Treatment traditions and habits also seem to affect the services provided in general practice. In Norway, the procedure 'strapping of ankle' was performed less often than in all other countries. This may not necessarily be considered a doctor's task; it is quite common to instruct the patients to do this themselves.

Conclusion and implications

GPs in the Nordic countries were generally well equipped, performed a wide spectrum of medical procedures and were involved in the follow-up of a wide selection of diagnosis. There are, however, differences that may be associated with variations in remuneration systems, geographical variations and other organisational factors.

If GPs are to take on an increased amount of tasks, a better understanding of what is at present offered in general practice is imperative. Experiences from other countries can be valuable. Differences should be investigated as a political and organisational as much as a medical issue.

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Disclosure statement

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