

ORIGINAL ARTICLE

Reasons for encounter and disease patterns in Danish primary care: Changes over 16 years

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Abstract

Objective. Approximately 98% of Danish citizens are listed with a general practice which they consult for medical advice. Although 85% of the population contact their general practitioner (GP) every year, little is known about these contacts. The aim of the present paper is to gain updated knowledge about patients' reasons for encounter and the GP activities and to make comparisons with a similar study from 1993. **Methods.** All GPs in the Central Denmark Region were invited to register all contacts during one randomly chosen day within a year. The registration included questions about patients' reasons for encounter, the types and contents of the contacts, referrals, and distribution between new episodes and follow-up contacts. Aggregated data were compared with the results from 1993. **Results.** A total of 404 (46%) GPs participated. The number of contacts per 1000 inhabitants had risen by 19.7%. The reasons for encounter and final diagnoses resembled those in 1993. Musculoskeletal, psychological, and respiratory problems were the most common reasons for encounter, psychological problems being the only type to increase over the period. Interestingly, the proportion of diagnoses within the ICPC 'A' chapter rose from 13.5 to 19.7%. The referral rate rose by 2% (relative: 18.7%) from 10.7% to 12.7% and the share of follow-up contacts rose from 45.9% to 50.4% (relative: 8.7%). **Conclusion.** Quite small changes were seen in the patterns of reasons for encounter and diagnoses from 1993 to 2009. However, an increase was found in contacts with general practice and referrals and in the proportion of follow-ups.

Key Words: Denmark, diagnoses, general practice, reasons for encounter, referral rate

Introduction

Nearly all Danish citizens (98%) are listed with a general practice [1]. Danish general practitioners (GPs) act as gatekeepers to secondary care [2]. Except when dialling 112 for emergency cases, the patients need a referral from their GP to obtain specialist care for hospital admission or for access to an outpatient clinic. General practice thus forms the front line of the health care system [1,3,4]. The Danish health care system favours interpersonal doctor–patient continuity of care, which is highly valued by the patients [5]. During one year about 85% of all citizens are in contact with their GP [6]. Paradoxically, little is known about the contents of these contacts.

Danish GPs operate on a mixed fee-for-service and capitation basis and all contacts are registered with the national Health Insurance Service Registry

[7,8]. The register does not contain information on the reasons for the encounter (RFE) and the final diagnoses. Such data must be obtained elsewhere.

A 1993 survey of patients' RFE shed light on some of these issues [9]. According to this survey, GPs managed 89.3% and referred 10.7% of all contacts to specialists. The important implication of this is that a small increase of 1% in referrals would produce a relative increase of about 10% in the number of referrals to the secondary health system. Changes in consultation trends in general practice therefore have health care expenditure implications and should be monitored to enable health care priorities and resource allocation to be tailored to patients' needs.

The entire health care sector has witnessed increased specialization, centralization and much technological change over the past decades [10,11]. Over time, these developments have affected the

Little is known about the trends in contacts with Danish general practice.

- The number of contacts per 100 000 citizens rose by 19.7% from 1993 to 2009.
- The number of referrals for specialist treatment or diagnostic imaging per consultation rose by 2% from 1993 to 2009.
- Musculoskeletal and respiratory problems remained among the most common reasons for encounters and diagnoses. Diagnoses in the 'A' chapter of ICPC rose from 13.5% to 19.7%.
- The proportion of follow-up contacts rose only slightly to nearly 50% of the consultations. However, this seemed to be due to an increased use of nurses whose follow-up contacts accounted for 76% of all their contacts.

pattern of the activities in the primary health care sector.

The aim of the present study is to provide updated knowledge on patient contacts with general practice and to describe developments over the past 16 years with regard to number of contacts, reasons for encounter, diagnoses, and referral rates.

Material and methods

A cross-sectional study was performed covering a 12-month period with all seasons represented from December 2008 to December 2009. All GPs in the Central Denmark Region (which accounts for approximately 20% of the Danish population) were invited to participate by registering all patient contacts during one day (alternatively one morning + one afternoon). The random allocation of dates for participating was based on the initial letter of the GP's first name. Dates were changed if they coincided with days off work or other atypical days. A week before the appointed date, 60 registration forms were sent to each GP together with written instructions. The GPs were offered a visit by the main investigator for further advice. The registration form encompassed a range of questions addressing the following themes: background information on the patient, type of contact, RFE and final diagnosis, and the content of the contact, including a question on whether the patient had raised additional problems beside the main reason for encounter during the consultation. RFEs and diagnoses were written in text or stated by codes using the International

Classification of Primary Care (ICPC) [12,13]. If the diagnosis had not been stated by the GPs it was coded by the research team based on information on RFE and the procedures performed. The ICPC coding was done by an experienced medical student, who was trained in ICPC coding. We reviewed the ICPC codes applied by the GPs to make sure that the codes were not inconsistent with ICPC-2 in case the GPs had used ICPC-1. Afterwards, all codes were validated by one of the authors (GM). In order to make the results comparable to the results from 1993 the processes and procedures without specification of organ were added to A (General and unspecified).

The survey from 1993 was performed in the county of Aarhus and involved 328 participating GPs (88%). RFEs and diagnoses were coded afterwards using ICPC-1. The 1993 survey did not involve the clinical staff. Consequently, the GPs registered all patient contacts during one day. In 2003 clinical staff gained permission to perform unassisted clinical tasks without involvement of the GP. Therefore, in order to be able to compare the results of the two surveys, we asked the GPs to let their clinical staff register patient contacts too. Instructions and 30 registration forms per participating staff member were sent a week before registration.

The GPs received payment (€32) for their participation and for each registered contact (€3). The GPs received an extra fee (€67) for staff participation.

Data analysis

We used chi-squared tests to analyse the representativeness of the participating GPs with respect to gender, seniority, type of practice, and number of listed patients. Data on the RFEs and diagnoses, new episodes and follow-up contacts and contacts with referrals were calculated and presented with the corresponding percentages for 1993.

Not all GPs wanted their clinical staff to participate. We therefore extrapolated the number of contacts in practices where staff participated to the total number of participating GPs while taking into account the background information on type and number of staff in each practice. In this calculation, we included only the contacts of the nurses based on the assumption that only the nurses substituted for the GP in performing unassisted clinical tasks. Data on the number of contacts with GPs in 1993 and in 2009 were achieved from the National Health Insurance department [7].

Poisson regression was used to compare the number of contacts per 1000 inhabitants. Two-sample tests of proportion were used to compare the

Table I. Representativeness of participating GPs with regard to gender, seniority, type of practice, and number of listed patients per GP.

GP characteristics	Participating GPs n = 404	All GPs in the region n = 871	p-value
Gender			
Male	224 (55.4)	532 (61.1)	0.002
Female	180 (44.6)	339 (38.9)	
Number of years in practice			
< 5	107 (26.5)	210 (24.1)	0.007
5–10	77 (19.1)	160 (18.4)	
10–20	139 (34.4)	279 (32.0)	
> 20	81 (20.1)	222 (25.5)	
Type of practice			
Single-handed	97 (24.0)	215 (24.7)	0.700
Group	307 (76.0)	656 (75.3)	
Number of list patients per GP			
< 1000	25 (6.2)	70 (8.0)	0.400
1000–1499	225 (55.7)	443 (50.9)	
1500–1999	137 (33.9)	315 (36.2)	
> 1999	17 (4.2)	43 (4.9)	

results from 1993 with the results of the present study. For proportions we calculated the 95% confidence intervals (95% CI).

Results

Among the 871 invited GPs, 404 gave their consent to participation (46.4%). With regard to the type of practice and the number of listed patients, there were no statistically significant differences between participants and all GPs (Table I). Women were over-represented in the participating group by 5.9% ($p = 0.002$) and GPs with more than 20 years in practice were underrepresented by 4.4% ($p = 0.007$). There were no statistically significant differences in the age and gender distribution between the listed patients of participating GPs and whole group of GPs (results not shown). The participating GPs were geographically spread all over the region, though with statistically significant differences in participation rate between the municipalities ($p = 0.002$).

The 404 days of registration were equally spread between spring–summer (204) and autumn–winter (200) though with fewer in the summer period (67). Likewise, all weekdays were represented, though with fewer Fridays (45), which is in accordance with shorter working days on Fridays for many GPs and fewer Mondays (68) compared with Tuesdays (109), Wednesdays (92), and Thursdays (90). However, further analyses showed no difference in number of contacts, types of RFEs, or the share of follow-up visits versus new episodes between the weekdays (results not shown). Table II shows an increase in the activity in general practice over 16 years. The total number of contacts with GPs per 1000 inhabitants rose by 19.7% from 1993 to 2009. The decrease in the proportion of telephone contacts mirrored an increase in electronic communication, which was not an option in 1993.

Patient contacts

The study included 15 178 patient contacts (13 090 GP contacts and 2088 nurse contacts). Table III shows the frequencies of the RFEs and diagnoses of the symptom- and disease-related GP contacts (prophylactic contacts and nurse contacts excluded) classified according to the 17 ICPC chapters for 1993 and 2009. The final diagnosis was extrapolated from the RFE in 3966 (30.3%) of the registered contacts. Beside the general ICPC chapter (A), in which we included processes (prescriptions, certificates etc.), musculoskeletal, psychological, and respiratory problems were the most common RFEs. This was also the case in the 1993 survey except that skin problems were more common than psychological problems. Additional problems beside the main reason for encounter were discussed during 35% of GP consultations.

The distribution by type of contact is given in Table IV. The share of follow-up contacts rose by 4% from 1993 to 2009. Table V shows a 2% increase (a relative increase of 8.7%) in referral rate from 1993 to 2009. This was primarily due to an increase in referrals to outpatient clinics and for diagnostic imaging.

Table II. Distribution of types of contact¹ in 2009 and in 1993 per 1000 inhabitants.

Types of contact	2009 (%)	1993 (%)	Difference (%)	Test of difference p-value
Clinic consultations	3703 (54.9)	2960 (52.5)	743 (25.1)	<0.001
Telephone contacts	2584 (38.3)	2491 (44.2)	93 (3.9)	<0.001
Home visits	94 (1.4)	184 (3.3)	−90 (−48.9)	<0.001
Email contacts	365 (5.4)	n/a	n/a	n/a
All	6746 (100)	5635 (100)	1111 (19.7)	<0.001

Note: ¹Based on registry data from the National Health Insurance Service Registry.

Table III. ICPC distribution of reasons for encounters and final diagnoses in symptom- and disease-related GP contacts in 2009 (nurse contacts not included) in comparison with corresponding shares for 1993.

ICPC chapter	Reason for encounter			Diagnosis		
	2009 (%)	1993 (%)	p-value*	2009 (%)	1993 (%)	p-value*
A: General	2828 (23.8)	15.7	<0.001	2334 (19.7)	13.5	<0.001
B: Blood	95 (0.8)	1.0	0.108	112 (0.9)	1.0	0.434
D: Digestive	641 (5.4)	6.0	0.050	622 (5.2)	5.4	0.499
F: Eye	177 (1.5)	1.7	0.227	182 (1.4)	1.6	0.212
H: Ear	188 (1.6)	2.2	0.001	209 (1.8)	2.3	0.007
K: Circulatory	905 (7.6)	7.1	0.147	1036 (8.7)	9.1	0.287
L: Musculoskeletal	1703 (14.3)	14.8	0.283	1717 (14.5)	15.1	0.200
N: Neurological	361 (3.0)	4.2	<0.001	358 (3.0)	3.3	0.193
P: Psychological	1021 (8.6)	8.1	0.171	1107 (9.3)	8.5	0.033
R: Respiratory	1171 (9.9)	12.9	<0.001	1286 (10.8)	14.1	<0.001
S: Skin	980 (8.3)	10.6	<0.001	994 (8.4)	10.4	<0.001
T: Metabolic	469 (4.0)	4.2	0.445	544 (4.6)	4.9	0.285
U: Urinary	386 (3.3)	3.3	1.0	410 (3.5)	3.2	0.207
W: Pregnancy	263 (2.2)	1.6	0.001	280 (2.4)	1.6	<0.001
X: Female genitals	474 (4.0)	4.8	0.003	464 (3.9)	4.1	0.439
Y: Male genitals	123 (1.0)	0.8	0.109	138 (1.2)	0.9	0.026
Z: Social	87 (0.7)	1.0	0.013	79 (0.7)	0.8	<0.001
All	11872 (100.0)	100.0		11872 (100.0)	100.0	

Note: *Test difference between 2009 and 1993.

Discussion

Main findings

The number of contacts with general practice rose almost 20% between 1993 and 2009. Most of this increase can be ascribed to an increase in consultations. Diagnoses falling within the categories covered by the ICPC 'A' chapter represented the most prominent increase from 13.5% to 19.7%. This indicates that the GPs performed more procedures (prescriptions, etc.) and that more contacts with general practice did not lead to a specific diagnosis. Musculoskeletal, psychological, and respiratory problems remained the most common RFEs and diagnoses. Psychological diagnoses were, however, the only one of these groups of specific diagnoses to show an increase during the period.

The share of follow-up contacts in general practice rose from 1993 to 2009 mainly because of an

increased use of nurses. Three-quarters of nurses' contacts were follow-up contacts. We saw a 2% increase in the proportion of contacts leading to a referral, mainly due to a more pronounced use of outpatient clinics and diagnostic imaging. Given a 20% rise in the number of contacts, the 16-year period thus saw a 42% rise in referrals.

Strengths and weaknesses

The present survey is the largest of its kind in Denmark. With half of the GPs in the Central Denmark Region participating (11% of all GPs in Denmark) it opens the black box of activity in general practice. Despite the statistically significant differences between participating GPs and all GPs, the differences are of little clinical relevance for the findings of this study. We had fewer registration days in the summer period reflecting that this is

Table IV. Distribution of symptom- and disease-related contacts in 2009 (nurses' contacts included) and 1993: New episodes vs. follow-up.

	2009			1993 Share of contacts (%)	p-value
	GP contacts	Nurse contacts	All contacts		
New episodes	5117 (43.1)	201 (13.6)	5318 (39.8)	42.0	0.080
Follow-up	5532 (46.6)	1123 (76.1)	6655 (49.9)	45.9	<0.001
No information	1223 (10.3)	152 (10.3)	1375 (10.3)	12.1	<0.001
All	11872 (100.0)	1476 (100.0)	13348 (100.0)	100.0	

Table V. Referrals to other parts of health care system in 2009 (nurse contacts not included) and in 1993.

	2009		1993		p-value
	Number of referrals (%)	95% CI	Referral (%)	95% CI	
Primary care specialist	483 (3.7)	3.4–4.0	3.3	3.0–3.6	0.08
Outpatient clinic	497 (3.8)	3.5–4.1	2.0	0.2–2.3	<0.001
Hospital admission	115 (0.9)	0.7–1.1	0.9	0.7–1.1	1.0
Laboratory	199 (1.5)	1.3–1.7	2.5	2.2–2.8	<0.001
Diagnostic imaging	372 (2.9)	2.6–3.2	2.0	1.8–2.3	<0.001
All referrals	1666 (12.7)	12.1–13.3	10.7	10.2–11.2	<0.001

a period with fewer working days due to the summer holidays. Despite regional differences in, for example, open access to A&E departments the Central Denmark Region is overall representative of the whole country with regard to contacts with general practice, hospitalizations, and the distribution of urban and rural areas [14]. Thus, mirroring the activity by GPs in the Central Denmark Region the study draws its conclusions on the basis of a large, representative sample of contacts with Danish general practice.

We accepted participation from GPs who did not want their staff to participate, mostly due to the workload, as the focus of the study was the GP experience of the work. However, obtaining information on the number of staff and number of work hours for staff members made it possible to extrapolate from the information of the participating staff to GPs with non-participating staff.

Based on the assumption that a staff member involved in a GP consultation might not know the patient's reason for attendance the staff registration form did not comprise questions about the RFEs and diagnoses. Therefore, the staff contacts are not included in the description of the RFEs and diagnoses. This may result in some uncertainty in the comparison with 1993. However, as the staff contacts made up only about 10% of all contacts this uncertainty is not likely to hamper the overall results.

Where the GPs stated two or more RFEs we included only the first on the assumption that this was the patient's most pressing problem. This exclusion procedure may introduce information bias; however, this bias is expected to play only a minor role as multiple RFEs accounted for only 5% of the contacts. Being aware that patients often have several things to discuss with the GP we added the question on whether additional problems beside the main RFE were raised during the contact. Thus, it was possible for the GP to pass on information regarding multiple problems without stating more than one RFE.

The GPs applied no diagnosis in 30% of the contacts but stated only the RFE, most often a symptom.

In such cases, the code for the RFE was extrapolated to the diagnosis. We considered this relevant as it is often the case that the final diagnosis cannot be stated immediately in general practice. Comparisons of the RFE with the diagnosis at contact level (not shown) revealed a marked similarity indicating that the problem of omitted diagnoses is limited.

Comparisons with the literature

The 20% increase in contacts with general practice is remarkable as the number of GPs rose only 10.5% at a nationwide level [15]. This rise may partly be rooted in the permission in 2003 to use clinical staff to perform fee-for-service consultations without the GP being involved. This has made it easier to meet the population's growing demands for health services in primary care. Part of the increased number of contacts may also be provider-induced as the proportion of the fee-for-service's earnings for GPs rose from approximately 50% in 1993 to 75% in 2009.

The pattern in RFEs and diagnoses in 2009 much resembled those in 1993, indicating a certain consistency in patients' needs for GP health care services. These findings are much in line with results from a survey in Australia from 2007–2008 [16]. However, contrary to our findings, psychological issues were not very common RFEs and their share of overall RFEs had not increased in Australia. Results from the Netherlands are in line with our findings showing a marked increase in patients presenting with depression and anxiety disorders [17].

The increasing number of RFEs and diagnoses categorized within the general ICPC 'A' chapter is probably due to use of more tests and other procedures in general practice, which was also seen in the Australian survey [16]. It may also be due to an overall heightened need for general advice on non-specific complaints.

The high and slightly increasing share of follow-up contacts may be explained by a stronger focus on proactive chronic care and by the growth in the number of patients with one or more chronic diseases. The growing share of follow-up contacts may

also be the result of task delegation to general practice, which shifts the follow-up burden from the secondary to the primary sector [18].

Interestingly, the overall share of referrals increased from 10.7% to 12.7% with more referrals going mainly to outpatient clinics and diagnostic imaging. This increase could be expected considering the growing focus on specialized treatment, the growing demand for precise and often high-tech diagnostic examination, and the lesser use of bed days in hospitals. Moreover, leaving a large number of the supposedly more unproblematic contacts with the staff, which are not included in the referral part of our survey, may have left the more problematic cases to the GP, implying relatively more referrals. In any case, the absolute rise in the number of consultations leads to a considerable rise in the number of referrals.

In conclusion, we found a considerable rise in the total number of contacts and referrals in general practice from 1993 to 2009 and we observed a rise in contacts classified within the ICPC 'A' chapter. This calls for more detailed analysis of reasons for and the effects of this change to better understand ongoing changes in medical help-seeking behaviour and the interaction between first- and second-line health care.

Acknowledgement

The authors would like to thank all the GPs and the clinical staff who took part in this study.

Ethics

The project was approved by the Danish Data Protection Agency (J.no. 2008-41-2195) and by the National Board of Health (J.no. 7-604-04-2/49/EHE). According to Danish law, approval from the ethical committee was not needed as no biomedical intervention was performed. The participating GPs received a fee that was partly dependent on the number of registered contacts.

Funding

This project has been supported by the County of Aarhus, the Central Denmark Region, The Danish National Research Foundation for Primary Care.

Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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