Home visits in general practice – most often for elderly patients:

A report from the Møre & Romsdal Prescription Study

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ABSTRACT

Objectives: Although home health care has been the fastest growing segment of the health care system during the last decades, general practitioners' (GPs') home visiting rates have declined. The aim of this study was to analyse home visits in relation to characteristics of both patients and GPs, the diagnoses, and the drugs prescribed.

Methods: A cross-sectional descriptive study in the Norwegian county of Møre & Romsdal. All encounters (90,458) and prescriptions (74,079) issued during two months were recorded.

Results: 5.074 home visits were recorded (9.2% of all face-to-face contacts). Home visiting rates were highest for the elderly and for children. Most home visits were for new diagnoses, and 28% took place during weekends. Infections in the respiratory tract comprised the majority of the diagnoses for visiting children, whereas coronary heart disease and heart failure were the most frequent diagnoses for visiting the elderly. Drugs were prescribed during 48.9% of the home visits. General systemic antiinfectives and respiratory drugs comprised 53% of all prescriptions, whereas CNS-drugs comprised another 20%. Doctors' characteristics associated with doing home visits were male gender, young age, GP specialisation, fixed salary, and rural location.

Conclusions: Home visiting policy should be more selective. While most children could be adequately taken care of by telephone consultations or consultations in the surgery, home visits should be encouraged for the chronically ill and the housebound.

INTRODUCTION

Until the last decades, visiting patients in their homes used to be a major part of general practice.[1] In 1952-55 a Norwegian general practitioner (GP) reported that 18% of his contacts with patients took place in their homes.[2] In the 1970's, however, only 5-6% of the contacts were home visits.[3,4] This proportion of home visits increased again after the 1970's, reaching approximately 10% of all contacts with patients in the late 1980's.[5] A similar proportion was reported from United Kingdom in the early 1990's.[6] In other countries, the decline in home visiting rates has continued. It is now in fact almost twice as common for elderly Americans to undergo a cardiac catheterization than to have a physician coming to visit them at home.[7] The decline in home visits is partly explained by the increasing use of technology in medicine and that many GPs therefore view home visits as both outdated and impractical.[8,9]

On the other hand, home care is now the fastest growing sector of medicine, and in the US this sector has increased at approximately 20% per year during the last decade.[10] This development is also facilitated by new technology that makes it possible to do even more of traditional hospital activities in the patients' own homes. "New" professions like home nurses and social workers have taken over much of the responsibility for this home based care.[8,10]

It is generally agreed that a home visit strengthens the GP-patient relationship, and that it may provide valuable information and insights that is useful for the GP.[8] However, while scheduled home visits for the chronically ill and the housebound should be encouraged, most home visits nowadays are probably performed for acute illnesses, out of hours, during nights, and often to other GPs' patients.[11-13] Many GPs are dissatisfied by the high workload and the low payment during out of hours periods, and this has prompted reforms to reduce the number of home visits in general practice.[14]

To plan for a more rational use of home visits, it is important to have detailed knowledge about the patients and GPs typically involved. The aims of the

present study were to determine the characteristics of the GPs who make home visits, their patients, demographic variables, diagnoses, and the drugs prescribed.

METHODS

This article is a report from the Møre & Romsdal Prescription Study (MRPS) in which almost all GPs in the Norwegian county of Møre & Romsdal recorded all contacts with patients and prescriptions during November 1988 and November 1989. Details about the MRPS have been described elsewhere.[15]

During the survey the GPs used a specially designed prescription form, a carbon copy of which was retained with a questionnaire. On this the GPs completed data about the kind of contact (direct or indirect; first time or follow-up), the diagnosis, and if the patient was referred. In case of drug prescriptions the GPs also filled in diagnostic indication(s) for each prescription, and whether the prescription was initial or repeat. The 12 pharmacies in the county kept a record every time a GP used his or her private prescription form instead of the form made for this study. This showed that other forms were used in less than 0.5% of the cases.[15]

Drugs were classified according to the Anatomical Therapeutic Chemical (ATC) Classification System.[16] Defined Daily Doses (DDD) and DDDs per prescription (DDD/P) were used to give the prescribed amounts. One DDD is defined as the assumed average daily dose for the main indication of the drug.[16]

Population-based home visiting rates were calculated as the number of home visits per 1000 inhabitants per year, excluding those living in nursing homes or other long-term care facilities, and based on the assumption that the number of visits per year was six-fold the numbers recorded during the two months' survey. The home visiting rate for each GP was calculated as the proportion of all face-to-face contacts.

A forward conditional multiple logistic regression analysis was performed in order to examine possible explanatory variables for doing house calls *vs*. other types of contacts. The following explanatory variables were examined: patients' sex, patients' age group (0-9, 10-19, 70-79, ≥80; each *vs*. the rest of the total), first contact *vs*. control, doctors' sex, doctors' age (≤38 years *vs*. >38 years; the median age), doctors' experience (<10 years *vs*. ≥10 years), GP specialisation, fixed salary *vs*. fee for service, solo *vs*. group practice, rural *vs*. urban location, weekend *vs*. rest of week, and year (1988 *vs*. 1989).

Statistical significance was accepted at $p<0.05$, and the confidence intervals given are 95%.

MATERIAL

Of the 156 GPs in the county, 149 (95.5%) participated in the MRPS during the first period. The participation rate rose to 98% during the second period.

Altogether, there were 90,458 GP-patient contacts, 74,079 drug prescriptions, and 55,198 face-to-face contacts of which 5,074 (9.2%) were home visits. For 245 home visits there were incomplete data regarding patients' age or sex. During the remaining 4,829 home visits, 3,125 prescriptions were issued.

On January 1st 1989, the population of the county was 238,287 of which 1514 were living in nursing homes or other long term care facilities.

RESULTS

The number of home visits corresponds to 130 visits per 1000 inhabitants per year. The home visiting rates were highest for children (0-4 year olds; 264 visits/1000 inhabitans/year) and for the elderly (80 years and over, 362 visits/1000 inhabitants/year) (Figure 1). The mean home visiting rate for each GP was 9.8% (95% confidence interval 8.3% to 11.2%). Twenty-five GPs did not record any home visits, 11 GPs recorded home visiting rates over 25%. More than one fourth (27.7%) of the visits were performed during weekends.

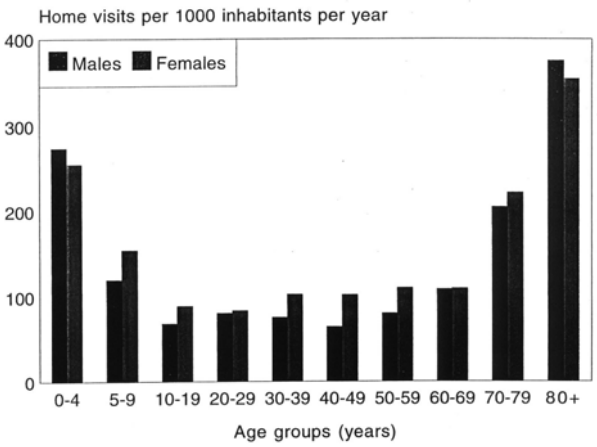

Figure 1. Estimated population based home visiting rates (numbers of home visits per 1 000 inhabitants per year) in general practice by patients' sex and age group.

Patients were most frequently visited for infections in the respiratory tract (25.1% of all), and the twenty most commonly recorded diagnoses comprised 56.2% of all (Table 1). While upper respiratory tract infections (URTI), skin injuries and low back pain were relatively more frequent reasons for visiting male patients, females were seen more often for cystitis, depression, and anxiety. Infections in the respiratory tract comprised the majority of the diagnoses for visiting children younger than ten years old. Among the elderly (60-79), coronary heart disease (CHD) was the most commonly recorded diagnosis, while for the oldest (80+) heart failure (HF) was the number one diagnosis.

Most (71.5%) of the patients visited in their homes were seen for problems that were new to this doctor.

Table 1. The twenty most common diagnoses for making home visits in general practice by: patients' sex, patients' age group, the proportion of the visits that were for new problems, and the proportion who received drug prescription (R_x) during the visit.

	Patients' sex			Patients' age groups (years) (%)									Sum		New diag-	
No. Diagnoses	M	F	Δ	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	%	n=	nosis (%)	R_x (%)
1. UpperRespTractInfect	7.0	5.2	!	15.9	6.7	4.5	5.0	2.8	2.4	2.1	1.1	1.6	6.0	290	88	61
2. Otitis	4.7	4.2	–	13.5	0.9	2.3	1.6	1.8	1.5	0.7	0.0	0.6	4.4	214	88	83
3. Acute bronchitis	3.8	3.8	–	6.2	4.7	2.3	3.6	2.8	3.4	3.0	1.7	3.5	3.8	182	73	88
4. AbdomPain/UlcerDisease	3.2	3.9	–	2.6	3.6	3.8	3.2	5.1	2.7	3.9	3.8	4.3	3.6	172	68	25
5. Tonsillitis	3.8	3.0	–	7.9	7.7	3.8	2.8	0.8	0.3	0.0	0.8	0.0	3.4	162	87	91
6. Pneumonia	2.9	3.6	–	2.7	4.0	0.6	2.0	2.0	2.1	3.5	4.4	7.4	3.3	158	80	78
7. Fractures/Distortions	3.2	3.3	–	1.8	5.5	4.5	2.4	2.8	3.7	2.8	4.7	2.3	3.2	156	93	20
8. Acute cystitis	1.7	3.5	!	1.8	2.6	3.8	2.8	2.0	2.4	3.2	2.7	3.9	2.7	131	71	83
9. Low back pain	3.5	2.0	!	0.3	1.0	5.5	5.0	4.6	7.0	3.0	2.5	0.4	2.7	131	72	63
10. Coronary heart disease	2.7	2.6	–	0.2	0.2	0.6	0.8	1.8	6.4	5.6	6.0	5.8	2.7	130	63	32
11. Skin injuries/ulcers	3.4	1.5	!	2.6	3.8	4.2	4.0	2.5	0.9	1.9	0.8	0.4	2.4	114	94	14
12. Fever	2.6	2.0	–	7.3	3.0	0.8	0.2	0.3	0.0	0.7	0.5	1.4	2.3	111	81	22
13. Heart failure	2.7	1.9	–	0.8	0.8	0.2	0.2	0.0	1.8	3.9	4.9	8.2	2.3	110	54	34
14. MusclesJointsTendons*)	1.7	2.6	!	0.2	1.6	2.8	2.6	4.6	4.9	3.0	2.7	1.4	2.2	107	74	67
15. Asthma	2.3	2.2	–	3.8	2.0	0.0	1.0	2.0	0.6	4.6	2.2	1.6	2.2	107	55	66
16. Depression	1.6	2.7	!	0.0	0.2	1.9	3.4	5.1	4.3	3.5	3.0	2.1	2.2	106	27	30
17. Skin infection	2.2	2.0	–	1.3	2.2	2.5	2.2	2.0	3.4	2.3	1.9	2.1	2.1	100	70	67
18. Anxiety/neurosis	1.3	2.3	!	0.1	1.0	1.5	3.4	3.8	4.0	2.3	2.7	0.8	1.8	89	34	41
19. Influenza	1.9	1.3	–	2.1	1.4	2.1	2.4	1.5	1.2	1.4	0.5	1.0	1.6	75	93	21
20. Sinusitis	1.3	1.6	–	0.4	2.0	3.4	3.4	2.5	2.1	0.7	0.3	0.0	1.4	69	82	91
Sum diagnoses (1-20)	57.4	55.2		71.4	61.1	51.4	51.6	50.9	55.2	52.2	46.9	48.6	56.2	2714		
Other diagnoses	42.6	44.8		28.6	38.9	48.6	48.4	49.1	44.8	47.8	53.1	51.4	43.8	2115		
Total	100.0	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	4829		
N =	2184	2645		1057	494	471	504	393	328	431	637	514	4829	4829		

* Muscles, joints, and tendons: unspecified symptoms and complaints

Δ The 95% confidence interval for the difference between the proportions *does not* include zero (!), or *does* include zero (-)

However, this proportion varied with the diagnoses recorded, and only 27% of the depression cases were new (Table 1).

10.2% of the patients visited were submitted to the emergency department in hospital. Among the top twenty diagnoses, the hospitalization rates were highest for fractures and distortions (47.3%), HF (21.1%), and CHD (19.4%).

The GPs issued drug prescriptions during 48.9% of the home visits, but the prescribing rate varied significantly with the diagnoses (Table 1). Altogether drugs in the ATC classes general systemic antiinfectives and respiratory drugs comprised 53% of all prescriptions, whereas CNS-drugs comprised another 20% (Table 2). The ten most commonly prescribed therapeutic groups comprised more than 80% of all prescriptions (Table 3).

A total of 72,510 patient contacts were included in the multiple regression analysis (Table 4). Of these, 4,266 were home visits. Old and young patients were more prone to get house calls, as were male patients. Contacts during weekends, and first time contact for the problem were strong predictors for house calls. Doctors' characteristics associated with house calls were male gender, young age, GP specialisation, fixed salary, and rural location. The rest of the explanatory variables did not contribute significantly to the explained variance of the dependent variable.

DISCUSSION

Methods

This report is based on data from the so far largest survey on patient contacts in Norwegian general practice.[15] The main strength of this study is that almost all the GPs in the county participated according to the protocol.

A limitation in our data is that the GPs did not record whether the visits were "acute" or "scheduled". Another limitation is that doctors may use some diagnoses to justify a treatment given, instead of vice versa (e.g. sleeping pills and insomnia). This may imply a possible over-representation of such diagnoses. However, we did not judge it as feasible to have standardized criteria for the diagnoses recorded by the GPs. This may represent a limitation of the validity, but the diagnoses used here probably are representative of diagnoses used by GPs during everyday practice.

Table 2. General practitioners' drug prescriptions (N= 3,125) issued during home visits distributed according to the ATC system main groups; by numbers of prescriptions, proportions of the prescriptions for male (M) and female (F) patients, and for different age groups, and the prescribed total volume, and the average amount issued per prescription (#).

	Prescriptions													Volume prescribed		
	Numbers		Patients'sex			Patients' age groups										
Drugs (ATC anatomical main classes)	n=	%	M	F	Δ	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80+	DDDs	%	DDD/P
Alimentary tract and metabolism	157	5.0	4.3	5.6	–	1.5	1.5	2.6	4.9	3.7	5.9	9.2	10.0	9.5	4,316	8.2	27.5
Cardiovascular system	161	5.2	5.7	4.7	–	1.0	1.8	0.3	1.4	1.5	6.8	10.4	13.9	12.5	14,669	27.8	101.2
General systemic antiinfectives	1151	36.8	36.2	37.3	–	53.4	54.0	38.4	34.1	25.6	24.2	28.1	22.7	28.5	8,540	16.2	7.5
Musculoskeletal system	190	6.1	6.3	5.9	–	0.9	3.4	9.6	8.7	8.9	10.5	7.2	6.5	7.1	2,888	5.5	15.3
Central nervous system	625	20.0	18.5	21.2	–	8.4	6.1	16.9	24.6	33.0	26.5	26.9	29.9	23.1	10,712	20.3	17.3
Respiratory organs	507	16.2	16.5	16.0	–	7.7	22.4	14.6	16.2	12.6	9.1	8.0	10.0	9.2	6,766	12.8	13.3
Sensory organs*	151	4.8	7.1	3.1	!	5.4	4.6	8.9	4.3	5.6	7.8	2.8	2.1	3.1	50	0.1	25.0
Others* **	183	5.9	5.4	6.2	–	1.7	6.1	8.6	5.8	9.3	9.1	7.2	4.9	7.1	4,749	9.0	43.2
SUM	3,125	100.0	100.0	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	52,690	100.0	18.3
n=			1360	1765		687	326	302	346	270	219	249	431	295			

\# The prescribed volume is given in total numbers of Defined Daily Doses (DDDs) prescribed and the mean numbers of DDDs per prescription (DDD/P).

Δ The 95% confidence interval for the difference between the proportions does not include zero (!), or does include zero (-).

* Some preparations and drug groups (ATC) do not have a DDD. Among these are: plasma substitutes and perfusion solutions (B05), other haematological agents (B06), dermatologicals for topical use (D), otologicals (S02), ophthalmo-/otological preparations (S03), other therapeutic products (V03), and diagnostic agents (V04).

** The ATC anatomical main classes (numbers of prescriptions): Blood and bloodforming organs (16), Dermatologicals (70), Genitourinary system and sex hormones (46), Systemic hormonal preparations excl. sex hormones (42), Antineoplastic and immunomodulating agents (1), Antiparasitic products (4), Various (4).

Table 3. The 10 most frequently prescribed drugs for patients during home visits in general practice by ATC system therapeutic groups and the three most commonly recorded diagnostic indications (%) for prescribing within each therapeutic group.

Drugs			The three most commonly recorded diagnoses for prescribing (%)						Diagnoses
ATC-No. code	Therapeutic group	% of all prescriptions	1. diagnosis	%	2. diagnosis	%	3. diagnosis	%	1+2+3 (%) of all
1. J01	Antibiotics	36.7	Acute bronchitis	15	Otitis	14	Tonsillitis	13	42
2. N02	Analgesics	10.7	Low back pain	17	Pain, unspecified	7	Fever	6	30
3. N05	Psycholeptics	8.0	Insomnia	28	Anxiety	25	Depression	8	61
4. R01	Rhinologicals	6.3	Otitis	38	Sinusitis	22	UpperRespTractInfect	21	81
5. S01	Opthalmologicals	4.5	Infect. conjunctivitis	45	Foreign body in eye	25	Other conjunctivitis	5	75
6. R05	Cough/cold prep.	4.4	UpperRespTractInfect	57	Acute bronchitis	18	Pneumonia	7	82
7. R03	Anti-asthmatics	3.7	Asthma	56	Acute bronchitis	13	UpperRespTractInfect	13	82
8. M01	NSAIDs	3.7	MusclesTendonsJoints*	39	Arthritis/arthrosis	22	Low back pain	11	72
9. M03	Muscle relaxants	2.3	Low back pain	39	MusclesTendonsJoints*	32	Neck pain	7	78
10. C03	Diuretics	1.9	Heart failure	62	Peripheral oedemas	15	Hypertension	8	85
Sum (1-10) %		82.2							
Others %		17.8							
N = (100%)		3,125							

* Muscles, joints and tendons: unspecified symptoms and complaints

The distribution of different diagnostic groups in patients seen in Norwegian general practice has previously been reported to be quite stable over time.[3,17] Drug prescribing practice may, however, change a lot over years. However, we think that this is mainly for single compounds, not affecting so much the data reported here: the distribution between the various ATC anatomical main groups, and the ATC therapeutic main groups. We therefore believe that our data regarding drugs still are relevant for general practice today even if they were recorded in 1988 and 1989.

Results

This study has confirmed earlier findings that children and elderly people are most prone to receive home visits by their GP.[6,11,18] A rate of 130 home visits per 1000 inhabitants per year is close to what was reported in a previous Norwegian study from 1982,[18] but considerably lower than a UK rate of 299 home visits per 1000 inhabitants per year.[6] The difference between Norway and UK is most pronounced for the very old. In our sample the rate was 362 visits per 1000 inhabi-

Table 4. Multiple logistic regression analysis of doing home visit (n = 4,266) *vs.* other types of contact (n = 68,244).

	Odds ratio	95% CI
Demography, time and type of encounter:		
Male patient	1.08	1.01–1.16
Age 0-9 years	2.43	2.21–2.66
Age 10-19 years	1.36	1.21–1.53
Age 70-79 years	1.90	1.72–2.11
Age ≥80 years	3.32	2.95–3.73
Weekend	14.06	12.82–15.43
First contact	3.54	3.29–3.81
Doctors' characteristics:		
Male doctor	1.42	1.29–1.56
Young doctor	1.17	1.08–1.27
GP specialist	1.18	1.09–1.28
Rural location	1.71	1.54–1.90
Fixed salary	1.18	1.09–1.27

tants 80 years and older, while Aylin et al. reported a rate of 3,009 visits per 1000 inhabitants 85 years and older.[6] This difference may partly be due to the fact that in the UK, mandatory and annual home visits for those aged 75 or more have been introduced by law.[19]

When home visiting rates are given as the proportion of all face-to-face contacts, however, the numbers are very similar in Norway and UK (9.2% *vs.* 10.1%).[6] Thus, it seems that differences in contact rates between Norway and UK affect surgery consultations and home visits to an equal degree.

The greying of the population during the last decades resulting in larger numbers of elderly home dwelling inhabitants, may be one explanation for the increase in home visiting rates as compared with those reported from the 1970's.[3,4] However, our results may indicate that Norwegian GPs perform too few home visits to the housebound elderly. On the other hand, many home visits for children could probably have been replaced by telephone consultations or by consultations in the surgery. Children account for a large proportion of night visits,[12] and therefore put a heavy strain on GPs on call.

The different diagnostic profiles between the age groups probably reflect differences in illness prevalence: infections in the respiratory tract dominating among the young, whereas coronary heart disease (CHD) and heart failure (HF) become more predominant among the elderly. This diagnostic pattern has also been found in similar surveys in other countries.[6,11,20]

That HF was the most commonly recorded diagnosis for seeing the oldest in their homes, underline the importance of this health problem among the oldest. The prevalence of HF in the elderly is about 10%,[21] and HF is the most common diagnosis for hospital readmissions in elderly patients.[22] This corresponds with our finding that about every fifth patient seen for HF was admitted to hospital.

The diagnoses recorded suggest that most home visits are prompted by acute and new illnesses (infections, trauma), or acute worsening of known disease (CHD, HF). Also considering that more than one quarter of the visits were performed during weekends, it is probable that home visits in Norwegian general practice in most cases are house calls performed on duty out of hours. We did not differ between "acute" and "scheduled" home visits, but in a previous Norwegian study it was found that 72% of the home visits were not scheduled.[18] A large proportion of these patients could probably have been more appropriately assessed by telephone consultation or at walk-in emergency care centres.[14]

During the last years, several studies have indicated that substantial health benefits can be achieved by organizing preventive home visits for the frail olds, and for the chronically ill.[23,24] In Denmark, Hendriksen and coworkers have performed a three year controlled study showing that intervening with preventive home visits every third month for the olds living in the community, may have substantial impact on hard endpoints like mortality and morbidity, and at the same time cost-saving in terms of less hospitalization, less use of nursing homes, and less use of house calls on duty out of hours.[23] Our results indicate that such physician-initiated visits rarely occur in Norwegian general practice. The National Health Administration should encourage a shift in the indications and the content of home visits in general practice to more planned home visits by their own GP to the chronically ill, the disabled, and the frail olds.

Large variations in home visiting rates between individual doctors and practices have previously been reported.[6] We found that the doctor's characteristics most strongly associated with doing house calls were rural location and male gender. Similar findings have also been reported by others.[18,20,25] It may be that a higher doctor/patient density in rural areas allows for more frequent home visits. Concerns about personal safety have been stated as a reason for not doing home visits,[25] and it could be that this is mostly a concern for female GPs. Another explanation for the gender difference is the general workload. Male doctors work significantly more hours per week than females, but female doctors do much more housework than their male counterparts do.[26]

CONCLUSION

Home visits are still an important part of general practice, and young children and the elderly are the main beneficiaries. Respiratory infections in children

and heart diseases in the old are the main reasons for doing home visits. Our findings indicate that the home visiting policy should be more selective. While most children could be adequately taken care of by telephone consultations or consultations in the surgery, home visits should be encouraged for the housebound and the chronically ill.

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