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Changing patient consultation patterns in primary care: an investigation of uptake of the Minor Ailments Service in Scotland

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ABSTRACT

Objectives: To study the impact and potential predictors of uptake of patient registrations and supplied medicines under the Minor Ailments Scheme (MAS) in Scotland. The MAS was introduced in 2006, intending to improve health care access by re-directing patients from primary care to community pharmacies.

Methods: Numbers of dispensed MAS items and patient registrations were obtained for all community pharmacies in Scotland for the period 2006–2009. Local demographic and socioeconomic characteristics were attributed to community pharmacies as potential predictors of MAS service uptake.

Results: There were significantly more MAS registrations in community pharmacies located in the most deprived areas. MAS registrations in rural areas were significantly lower than in urban areas. Rates of MAS items supplied ranged from 219.9 to 3604.6 items per 10,000 Health Board population in 2008/09. Urban pharmacies supplied 72.6 MAS items per month compared to 43.3 items per month by rural pharmacies. 96.7 items per month were supplied by pharmacies in the most deprived areas compared to 53.2 items per month in the least deprived areas.

Conclusion: There has been geographical variation in uptake of the MAS service. Community pharmacies under multiple ownership engaged in MAS activity to a greater extent than independent pharmacies, with higher uptake in community pharmacies located in deprived and urban areas.

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1. Background

Investigation into patients' consultation behaviour has postulated that the decision to consult a general practitioner (GP) is not solely based on the presence or absence of an individual's poor health, but may be influenced by a multiplicity of socioeconomic, demographic and psychosocial factors [1]. Cost of medicines and ease of access have been found to be key determinants in selecting either GP-provided prescriptions or over the counter (OTC) medicines from community pharmacies for acute, self-limiting illnesses (or "minor ailments") [2]. Exemption

from prescription payments was strongly associated with the decision to visit the GP for conditions that could be self-treated, rather than to pay for OTC medicines at the pharmacy.

A decade ago, patient demand for minor ailments treatment by GPs was the focus for a feasibility study, investigating management of self-limiting illnesses in North West England [3,4]. The "Care at the Chemist" study sought to re-direct patients to community pharmacists for a group of 12 minor ailments including head lice, vaginal thrush, sore throat, cough and diarrhoea. Patients who were exempt from prescription payments obtained medicines from a specified formulary through the community pharmacy. Overall the trial resulted in a transfer of 38% of the workload associated with the 12 conditions studied, and demonstrated that reconsultation rates did not differ

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significantly between those patients who consulted a GP and those who were treated by a pharmacist. Although the study found no change in overall GP workload, workload was reduced for the minor ailments group.

Primary Care Organisations (PCOs) in England were keen to establish pharmacy-based MAS [5], and their adoption was promoted nationally [6]. The model used in the feasibility study formed the basis for the Department of Health service specification template for MAS, introduced as a locally commissioned NHS enhanced pharmaceutical service. By 2007/8, 26% of English community pharmacies were contracted by 57% of the 152 PCOs to provide MAS services [7]. More recently, the Department of Health has undertaken an impact assessment of MAS, noting:

- the longer opening hours of community pharmacies and their ready accessibility in more deprived areas
- a reduction in the burden of minor illness on GPs, and
- the potential cost savings from improved efficiency [8].

Paradoxically, in a recent analysis of the development of community pharmacy-based clinical services in England, it has been suggested that there is limited evidence for the commissioning of MAS [9].

Also using a similar model to “Care at the Chemist”, the Direct Supply of Medicines Scheme (DSoM) piloted community pharmacy-based Minor Ailments Services in two areas of Scotland from 2001 [10,11]. The service was mainly used by patients aged under 16, while elderly patients were low users of the scheme, preferring GP consultations for minor ailments. Community pharmacists welcomed the transfer of general practice workload as an enhancement of their contribution to patient care. The DSoM prefigured the introduction of a national MAS in Scotland in July 2006. The national scheme was limited to patients exempt from prescription charges, including children, people aged 60 or over, those in receipt of state benefits or pensions and people with certain chronic illnesses or continuing physical disability [12]. Eligible patients were registered at a Scottish NHS general practice and not resident in a care home. Patients could register with a single NHS community pharmacy having the ability to transfer registration to a different pharmacy should they wish. The scheme was favourably received by patients, who were satisfied with the easier access provided by community pharmacies and by the quality of advice and service provided.

The MAS was implemented as one of four core components within the new Scottish Pharmacy Contract including public health, acute medication and chronic medication services with a phased introduction managed on three administrative levels: nationally by the Scottish Executive Health Department, by the 14 NHS Health Boards and by local implementation groups [13,14]. The MAS was introduced with key health enhancement aims: (i) to improve patient access; (ii) promote care through community pharmacy; (iii) transfer care from GPs and nurses to pharmacists where appropriate and (iv) address health inequalities. Achievement of these aims is challenged by particular difficulties for the Scottish health system, which is presented with traditionally high levels of chronic urban morbidity and barriers to health care access for dispersed

rural communities [15,16]. Scotland’s diverse socio-economic and geographical characteristics present potential local obstacles for consistent introduction, implementation and integration of the MAS which were highlighted as possible reasons for uneven uptake during the DsoM pilot. This paper aims to study the impact and potential predictors of uptake of MAS patient registrations and supplied medicines in Scotland.

2. Method

2.1. Data sources

Data were obtained from the NHS National Services Scotland Information Services Division including monthly aggregates of MAS items supplied with drug name and formulation, total MAS patient registrations, and medication items (i.e. MAS and non-MAS) supplied for each community pharmacy. The dataset included monthly reimbursement amounts, registration bandings, identifying independent or multiple pharmacy ownership (multiple pharmacies are chains of six or more branches). Community pharmacies received reimbursement through banded capitation fees based on the number of people on the pharmacy MAS register. The four bands and fees as at September 2008 were: £325.83 per month for between 1 and 250 registered patients; £488.58 for 251 to 500 patients; £651.47 for 501 to 750 patients and £651.42 for over 750 patients plus an extra £0.67 per head over 750 patients [17]. Should a MAS registered patient not receive treatment or advice under the scheme over a 12-month period, the registration would lapse for remuneration purposes, though might be re-activated should they subsequently present at the pharmacy for treatment. Monthly data were provided between July 2006 and March 2009 allowing analysis from the scheme’s inception.

Potential locality-based determinants were identified to test the extent that MAS activity could be explained by these factors. Data were aggregated to NHS Health Board level and local data zones, statistical areas typically populated by between 500 and 1000 household residents designed, where possible, to contain households with similar social attributes [18]. Pharmacy postcodes were linked to data zones using the May 2009 National Statistics Postcode Directory. The potential determinants used in the analysis included the 2006 Scottish Index of Multiple Deprivation (SIMD), a deprivation measure commonly used to investigate relationships between population characteristics and local service provision [19]. Percentage of people with limiting long-term illness was included, a self-reported indicator allowing between area comparisons of health need [20]. We used population aggregates as proxy measures of intensity of pharmacy workload, including total resident population, residents aged under 16 and residents aged 65 or over. A dichotomous urban or rural locality indicator was included to account for variations that may affect the 18.7% of the 5.1 million Scottish population living in rural areas [21]. Locations of dispensing general practices were included in the dataset identified by postcode. Health Boards usually introduce dispensing general practices into sparsely populated areas where access to community phar-

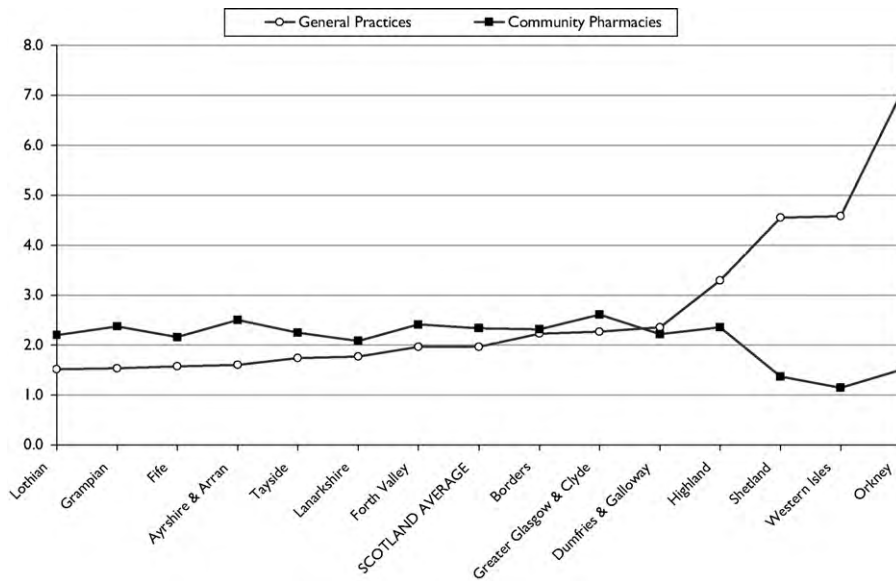


Fig. 1. Numbers of community pharmacies and general practices per 10,000 Health Board population (2009).

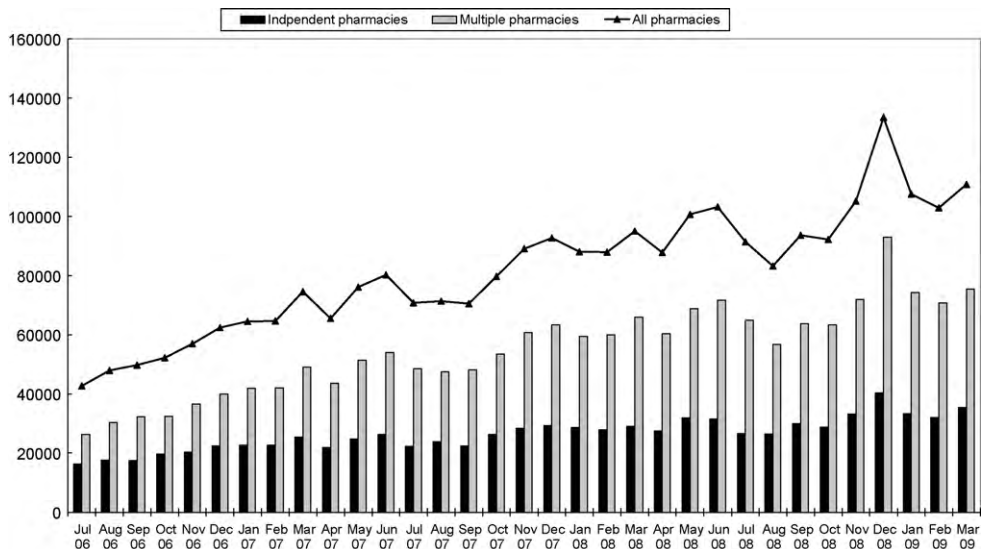


Fig. 2. Minor Ailments Service items supplied per month in Scotland between July 2006 and March 2009.

macy services is limited and can supply medicines directly to patients. Dispensing general practices provided 3.7% of all dispensed prescriptions in 2008/09 [22].

2.2. Statistical method

Data analysis was performed using SPSS (version 16.1). The SIMD data zone rankings were grouped into quintiles ranging from the most deprived to least deprived data zones. The urban or rural indicator was conflated into two categories using the Scottish Executive’s 8-fold version of settlement size classifications, with the rural category consisting of “very remote small towns”, “accessible rural”, “remote rural” and “very remote rural” [23]. Independent-samples *t*-tests were performed to compare

MAS dispensing and registration rates between rural and urban pharmacies. One-way analysis of variance was performed to explore the impact of deprivation on MAS activity. Multiple linear regression was used to determine associations between supplied MAS items and the potential explanatory variables.

3. Results

3.1. Community pharmacy distribution

There were 1206 community pharmacies in Scotland as at March 2009, of which two-thirds (66.3%) were multiple pharmacies. Over a quarter of independent pharmacies (27.6%) and multiple pharmacies (27.5%) were located

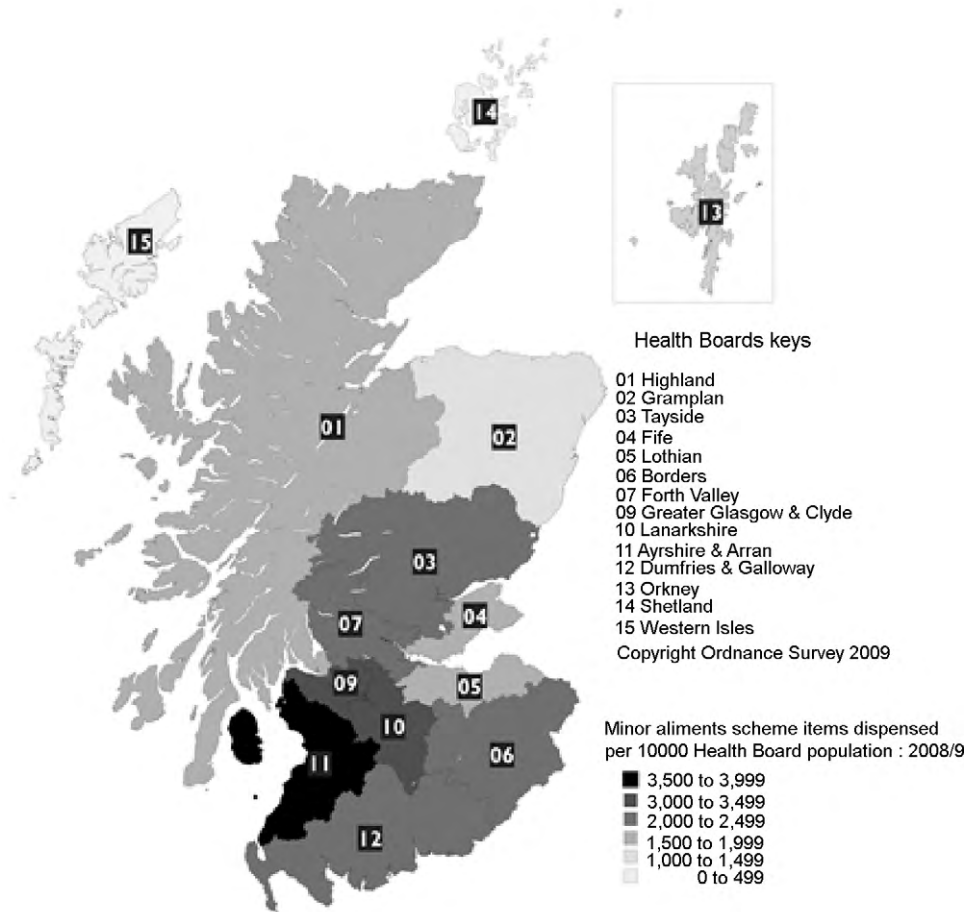


Fig. 3. Minor Ailments Service items supplied per 10,000 Scottish Health Board population 2008/09.

in the most deprived SIMD quintile (Pearson's $X^2=5.2$, $p=0.27$). A larger proportion of independent pharmacies (21.6%) were sited in rural areas compared to multiple pharmacies (10.8%) (Pearson's $X^2=27.1$, $p<0.05$).

Distributions of community pharmacies and general practices were broadly similar, other than within the more sparsely populated Health Boards. There were 2.3 community pharmacies per 10,000 Health Board population (SD=0.4) compared to a rate of 2.0 for general practices ($n=1017$; SD=1.6). Five Health Boards showed lower rates for community pharmacies than for general practices, most notably in four least densely populated Health Boards of Highland, Shetland, Western Isles and Orkney (Fig. 1). These four Health Boards contained 78 (60%) of Scotland's 129 dispensing general practices.

3.2. Registrations

The first 12 months of the scheme showed monthly increases in numbers of people registered with a sharp decrease in July 2007 as people who had not received treatment over the year were removed from the register. Mean monthly registrations were significantly greater in community pharmacies in the most deprived SIMD

quintiles over the period July 2006 to March 2009 ($F=43.9$, $p<0.001$). Urban community pharmacies had registered significantly more ($t=12.7$, $p<0.001$) patients per month (mean=542.3; SD=72.6) than those in rural areas (mean=347.5; SD=49.6).

3.3. MAS items volumes

1,211,900 MAS items were supplied during 2008/09. The share of all MAS items supplied by multiple pharmacies increased from 64.2% during the first 9 months of the scheme from July 2006 to March 2007, to 68.9% during 2008/09. Numbers of MAS items supplied continued to increase over the whole study period with winter and summer seasonal fluctuations (see Fig. 2). The mean rate of MAS items supplied per 10,000 population in Scotland was 2344.8 (median=1940.5; SD=926.7) for 2008/09, with a wide variation in rates of MAS items supplied per 10,000 Health Board populations, ranging from 219.9 items per 10,000 population (Western Isles) to 3604.6 (Ayrshire and Arran) (see Fig. 3). Mean monthly MAS items dispensed were significantly higher for community pharmacies located in the most deprived SIMD quintiles (mean=96.7 items per month, SD=73.3) compared

Table 1
Multivariate analysis of Minor Ailments Service items dispensed and potential predictors of uptake in Scotland 2008/09.

Predictor	Multivariate model		
	Beta coefficient (CI)	<i>t</i>	<i>P</i> value
SIMD deprivation score ^a	7.2 (3.9,10.5)	4.3	<0.001*
Urban pharmacy location ^b	278.4 (140.3,416.5)	3.9	<0.001*
Independent pharmacy ^c	−113.1 (−212.0, −14.2)	−2.2	0.03**
Percentage of population aged under 16 ^d	15.8 (1.4,30.1)	2.2	0.03**
Percentage of population with limiting long-term illness ^e	7.2 (−0.6, 14.9)	1.8	0.07
Percentage of population aged 65 or over ^d	1.6 (−6.7, 9.8)	0.4	0.7
Constant	188.6 (−84.7, 461.9)	1.4	0.2

$F(6, 1270), 14.8 F, <0.001$; adjusted $R_2 = 0.06$.

^a Scottish Executive: Scottish Index of Multiple Deprivation 2006.

^b May 2009 National Statistics Postcode Directory (reference category = rural pharmacy location).

^c NHS National Services Scotland Information Services Division (reference category = multiple pharmacy).

^d Mid-2008 population estimates—General Register Office for Scotland.

^e Scottish Population Census 2001—General Register Office for Scotland.

* $P < 0.001$.

** $P < 0.05$.

to those in the least deprived areas (mean = 53.2 items per month, SD = 47.4), (one-way Anova: $F = 34.1, p < 0.001$). Mean items per month were also significantly higher ($t = -7.93; p < 0.001$) in urban pharmacies (mean = 72.6; SD = 17.6) compared to those in rural areas (mean = 43.3; SD = 11.8).

Overall, there were 0.2 MAS items supplied per registration per month in 2008/09 (median = 0.16; SD = 0.2). The annualised rate for 2008/09 was 1.9 MAS items per registration (Western Isles) ranging to the highest rate of 2.2 (Ayrshire and Arran). Mean MAS items supplied per pharmacy in Scotland was 1015.8 (median = 877.3; SD = 339.9).

Table 1 shows results from the multivariate regression analysis for the six potential predictors. Four significant variables were found, with higher provision of MAS items more likely in pharmacies located in data zones experiencing higher SIMD deprivation (B coefficient 7.21; 95% CI 3.91, 10.5; $p < 0.001$). Similarly, pharmacies in urban settings were more likely to have higher levels than rural pharmacies (B coefficient 278.39; 95% CI 140.28, 416.49;

$p < 0.001$). Independent pharmacies were less likely to have higher MAS dispensing rates than multiple pharmacies (B coefficient −113.13; 95% CI −212.04, −14.21; $p < 0.05$). Pharmacies in areas with higher proportions of people aged under 16 were significantly associated with higher MAS levels (B coefficient 15.77; 95% CI 1.43, 30.11; $p < 0.05$).

3.4. MAS medicines supplied

The MAS share of all dispensed items was 1.4% in 2008/9 (see Table 2). The top 10 medicines with the highest MAS dispensing volumes took an aggregated 12.0% share of all dispensed items in that group, with markedly high shares for head lice treatments and simple linctus. Paracetamol was the most commonly supplied MAS medicine (19.4% of all MAS items), followed by ibuprofen (6.8%), simple linctus (6.0%), chloramphenicol eye drops (3.6%) and emollients (3.5%). There were some differences in proportions of items supplied between community pharmacies located in the most deprived and least deprived areas. Citric acid (simple linctus) was the second highest supplied medicine in the most deprived areas (7.3%) and fifth most supplied

Table 2
Top 10 Minor Ailments Service medicines dispensed in Scotland 2008/09.

Approved drug name (minor ailment)	All items dispensed ^a	MAS items dispensed	MAS items dispensed as % all items	% of MAS total (rank)	% Most deprived quintile (rank)	% Least deprived quintile (rank)
Paracetamol (pain, fever)	1,862,874	234,791	12.6	19.4 (1)	20.2 (1)	19.2 (1)
Ibuprofen (pain, fever, inflammation)	703,200	82,507	11.7	6.8 (2)	6.4 (3)	7.9 (2)
Citric acid i.e. simple linctus (cough)	115,858	73,034	63.0	6.0 (3)	7.3 (2)	3.8 (5)
Chloramphenicol (eye infection)	23,0677	43,640	18.9	3.6 (4)	2.9 (6)	5.0 (3)
Emollients (skin)	1,353,640	42,594	3.1	3.5 (5)	2.7 (7)	4.6 (4)
Clotrimazole (vaginal thrush)	279,686	39,456	14.1	3.3 (5)	3.4 (4)	2.9 (7)
Dimeticone (head lice)	65,731	36,119	54.9	3.0 (7)	3.4 (5)	2.3 (10)
Chlorphenamine maleate (Hay fever)	187,654	34,679	18.5	2.9 (8)	2.6 (9)	3.3 (6)
Malathion (head lice)	41,243	31,449	76.3	2.6 (9)	2.7 (8)	2.0 (12)
Compound alginate acid preparations (indigestion)	564,506	29,305	5.2	2.4 (10)	2.4 (11)	2.3 (9)
Total top ten MAS medicines	5,405,069	647,574	12.0	54.4		
Remaining MAS medicines	80,915,868	564,326	0.7	46.6		
Total	86,320,937	1,211,900	1.4			

^a Prescriptions dispensed by community pharmacists, appliance suppliers and dispensing doctors. Source: ISD prescription cost analysis (2008/09).

(3.8%) in the least deprived areas. Overall, the combined percentage for the head lice treatments dimeticone and malathion was 5.6%, with a combined total percentage of 6.1% in highly deprived areas compared to 4.3% in the least deprived areas. The percentage of chloramphenicol eye drops supplied under MAS dispensing was higher in the least deprived areas (5.0%) than highly deprived areas (2.9%).

3.5. Remuneration

The first 12 months of the MAS scheme showed a steady increase in numbers of community pharmacies in the top remuneration band of over 750 registered patients (see Fig. 4). There were 135 (11.7%) pharmacies in the top band in July 2006, increasing to 433 (36.6%) over the 12 months. Following the large-scale reduction of inactive registered patients in July 2007, the top band fell to 180 (15.2%) pharmacies. Over the following period, the number and proportion continued to increase, though at a slower rate with almost a quarter in the top remuneration band in March 2009 (284 pharmacies, 23.5%). There mean monthly number of MAS registrations in participating pharmacies 523 during 2008/09 and there was no evidence of clustering around payment band boundaries.

Multiple pharmacies were more likely to be in the highest remuneration band and the proportion increased at a greater rate than independent pharmacies. There were 81 (11.1%) multiple pharmacies in the highest remuneration band at July 2006, increasing to 205 (25.8%) at March 2009. This was greater than the rate of increase and proportion of independent pharmacies in the highest remuneration band which was 54 (12.6%) at July 2006, rising to 79 (19.2%) at March 2009. Almost a third (29.9%; $n = 123$) of independent pharmacies were in the lowest remuneration band of 250 registered patients or less, compared to 17.7% ($n = 141$) of multiples.

4. Discussion

The MAS is a significant nationally funded innovation devoted to managing patient access to clinical services. Numbers of MAS registrations and dispensed items have grown steadily since the introduction of the scheme, improving patient access to treatments for the management of self-limiting conditions via community pharmacies for those patients that do not pay prescription charges. There is no evidence that the remuneration structure encouraged gaming behaviour at the payment band boundaries or distorted provision. This study has found variations in MAS uptake, based on location characteristics and type of pharmacy ownership. Community pharmacies under multiple ownership, have engaged in MAS activity to a greater extent than independent pharmacies, with higher overall uptake in community pharmacies located in deprived and urban areas. MAS activity in relatively remote and less densely populated Health Boards is likely to be affected by higher numbers of dispensing practices and fewer pharmacies.

A potential disadvantage of the study design is the possible presence of ecological fallacy, attributing homogenised

population characteristics to community pharmacies, based on aggregated data for the pharmacy's geographical location. Though research into general practice population characteristics commonly uses this method to create proxy indicators, general practices usually enjoy geographically bounded registered patient lists. Intuitively, commercial settings of community pharmacies will provide greater variation in patients' home starting point and, therefore, attaching aggregated local characteristics may have weaker validity. However, the strong associations between levels of uptake and higher proportions of children, deprivation and urban settings within our results, suggest patient utilization is related to local health need. Patterns of pharmacy use have previously been linked to the nature of particular illnesses and specific demographic groups [24]. Females, particularly those with young children, are more likely to consult a pharmacist while older people, though high users of dispensed medicines, are less likely to visit for advice.

The MAS service has been promoted by policy makers as an additional patient-focused service intending to improve efficiency and ease of patient access. Increasing MAS medication volumes and registrations suggest growing perception of and commitment to the scheme, though it is not clear how consistent patient commitment to MAS is. Recent studies indicate that the extent of shifting the management of minor ailments to community pharmacists is affected by influences on patient preferences. A 2006 discrete choice experiment survey in Scotland found that patients preferred to self-manage self-limiting conditions, with community pharmacists as the preferred source of advice compared to practice nurses or the NHS 24 telephone service [25]. Patients were, however, prepared to take a less-preferred avenue of health care advice should they incur reduced costs and waiting times.

Other studies have investigated barriers to patient utilization of community pharmacies for minor ailments treatment and advice. Evidence from an evaluation of patient awareness and comfort with community pharmacist prescribing indicated demographic factors such as older age, better self-rated health status and higher educational attainment predicted greater awareness of the service [26]. However, the study described patient concerns about the extent of pharmacists' diagnostic knowledge compared to GPs and unease with privacy and confidentiality in pharmacy settings. The original Care at the Chemist study showed clear demographic divergence in service utilization and treatment choice for several of the 12 conditions included in the study [4]. Approximately three quarters of the pharmacy-provided service users were female while older people were more likely to visit the GP. Patients favoured community pharmacies for head lice and vaginal thrush treatments, while the GP was the predominant destination for earache, cough and upper respiratory tract infections.

Abolition of all patient prescription charges in Scotland will be introduced April 2011, with an intervening phased reduction in payments (i.e. 2007 prescription charge per item: £6.85; 2008: £5.00; 2009: £4.00; 2010: £3.00). How the reduction and abolition in charges in Scotland might impact on the distribution of health care seeking behaviour is unclear. However, a study of non-sedative antihistamine

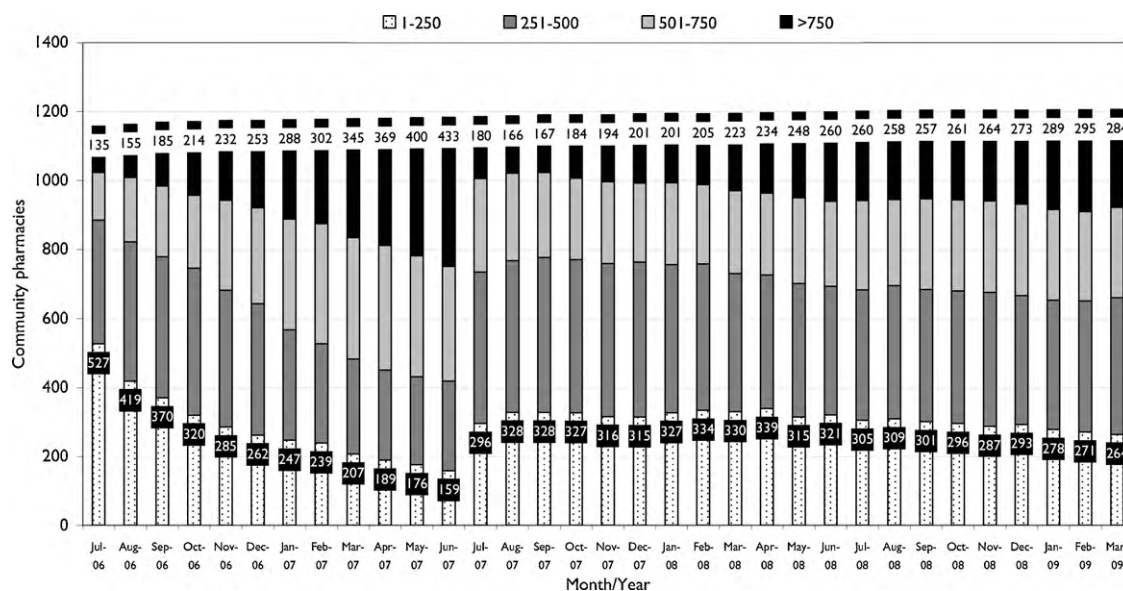


Fig. 4. Number of community pharmacies by Minor Ailments Service remuneration bands in Scotland, between July 2006 and March 2009.

prescribing in Wales during a similarly phased abolition of the prescription charge showed increased prescribing in the least deprived areas. It was suggested patients not exempt from payments were visiting the GP to avoid more expensive OTC medicine payments and sacrificing speedier access [27].

A key aim of the service was to reduce health inequalities through better access [28]. Our findings show that community pharmacies in urban and the most deprived areas have been most active in providing MAS services. Lower uptake rates in rural areas suggest that rural patients have not benefited to the same extent, placing a possible additional inequity on remote communities' existing reduced healthcare options, often constrained by extended travel times and appointment-based services. In designing and establishing a wider range of community pharmacy services, attention needs to be given to these revealed inequalities and how they can be reduced.

This analysis of the uptake and impact of the national MAS in Scotland is the culmination of a series of evaluation studies [3–5,10] through feasibility to national implementation stages of pharmacy-based services that aim to improve access and efficiency of the treatment of minor ailments in primary care. They demonstrate the effectiveness and efficiency of MAS and this study in particular shows the association between levels of uptake and local deprivation and urban setting.

A final observation is that the remuneration structure for MAS in Scotland may provide clues to avoiding the perverse incentives of volume-driven payment arrangements for other pharmacy services, notably medicines use reviews [26]. Instead of simply concentrating on the impact of pharmacy ownership on service provision and quality, and characterising general medical practice as “NHS primary care” and pharmacy as the “for profit community pharmacy sector” as recent commentators have [9], more effort should be directed at commissioning services on

the basis of appropriateness and quality. Renewed thought needs to be given to effective remuneration frameworks for community pharmacy [29,30] that appropriately incentivise both community pharmacy owners and practitioners.

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