

**DRAFT 1**

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**Use of prescription only medicine (POM) in older people living in the community**

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## **Abstract**

*Objective:* to describe the pattern of the use of prescription only medicine (POM) for older people living in the community, and to study health status and socio-demographic factors associated with their use.

*Design:* cross-sectional survey

*Setting:* England 1998

*Participants:* a national sample of older people aged 65 or over living in non-institutional private households

*Outcome measure:* nurse assisted self-reported use of prescription-only medicines by doctor

*Results:* Eight one per cent of women and 74% of men had at least 1 POM by doctor. Multiple medications of using four or more medicines were found in 30% of the women and in 26% of the men. Over 90% of the medicines prescribed by the doctor were used. Age, sex, longstanding illness, minor depressive symptom as estimated by GHQ case and the recent use of health services all had significant effects on POM use but not social class, living alone and perceived social support. Older people with limiting longstanding illness had an odds ratio of 7.56 for POM use than those who did not have longstanding illness (95% confidence interval 5.80-9.86). Older women, having consulted GP during the last fortnight and the presence of minor depressive disorder had significantly higher odds ratios for POM use (OR=1.31, 2.55 and 2.47 respectively). Concurrent use of four or more medicines is 27 times higher in older people with limiting longstanding illness than those who did not have longstanding illness.

*Conclusion:* With the increasing growth in the number of older people, the problem of polypharmacy and the associated high risk of adverse drug reaction will no doubt add to the burden on the health care resources which has already been stretched to the limit to cope with the rising cost of elderly care

## Introduction

Health care needs in older people are generally greater than those of the younger people. In England, in 1999 about 16% of the population were aged 65 or over and they consumed nearly 40% of the hospital and community health services expenditure <sup>1</sup>. The use of pharmaceutical services for the older people was also very high. Between them, they had on average of 28 prescription items compared to around 6 for those of working age. This cost around £270 per head per year and accounted for half of the £7 billion medicines bill <sup>2</sup>.

The National Service Framework (NSF) for older people published recently concerns with the clinical and cost effectiveness of such spent in medicine <sup>3</sup>. In the document “Implementing medicines-related aspects of the NSF”, questions are raised regarding the way medicines are used for and by the older people can be improved especially on the risk of adverse drug reaction (ADR) caused by multiple medication (polypharmacy) in this population.

To date, only a few studies have been carried out in England on the prescription-only medicines (POM) use among older people living in the community. Studies have shown that POM use among older people is associated with increasing age, older women, recent hospitalisation, depression and poor self-reported health status <sup>4-8</sup>. However, the relationship between POM use and other socio-economic factors such as social class is not clear. Little information is available about the concurrent use of drugs among these people either. In a study of older people in five geographic areas in England and Wales both in institution and community settings, Chen et al <sup>4</sup> reported concurrent use of five or more prescription and non-prescription drugs in 11% of those aged 65-74 and in 15% of the 75s. Barat et al <sup>9</sup> in a separate study of a sample of old people aged 75 and over living in their own home reported a high 34% of the respondents using five or more medicines concurrently.

In this study data from the English Health Survey for the year 1998 are used to investigate and examine the pattern of POM use among people aged 65 and over living in the community.

## Material and method

The Health Survey for England (HSE) is a series of annual, nationwide household sample surveys commissioned by the Department of Health since 1991. It is designed to be nationally representative of people living in non-institutional private households. Its objective is to monitor trends in the health of people in England, the prevalence of specified health conditions and associated risk factors, differences between sub-groups, and targets in the health strategy. The survey is a face-to-face interview including computer assisted interview, self-completion of questionnaire, clinical measurements and physical measurements. It consists of two separate elements: an interviewer visit followed by a nurse interview. About 20,000 people are sampled each year, and health-related data are collected via both interviews and objective measures such as analysis of blood samples, measurement of blood pressure, etc. The HSE contains a 'core' which is repeated each year, additionally each survey has a module on subjects of special interest (cardiovascular disease, children, etc). The 'core' includes: questions on general health and psycho-social indicators, smoking, alcohol, demographic and socio-economic indicators, questions about use of health services and prescribed medicines, measurements of height, weight and blood pressure.

During the nurse interview, question was asked if the respondent was taking or using any medicines, pills, syrups, ointments, puffers or injections prescribed by a doctor. The names of the medicines were then taken down from the containers for all prescribed medicines currently being taken. The names were later coded into British National Formulary (BNF) category. For each POM, the respondent was also asked if it was taken/used in the past seven days before the interview.

In this study the 1998 HSE was used to describe the pattern of medicines prescribed by doctor among older people aged 65 years or over and their actual use of POM. Statistical modelling based on logistic regression was used to model the probability of using POM with respect to self-reported health status, minor psychological health state as measured by the General Health Questionnaires 12 item version (GHQ12)<sup>3</sup>, use of health services including GP consultation during the last fortnight and hospitalisation in a reference

period of 12 months, socio-economic and socio-demographic factors including social class, gender, living alone, and perceived social support. Self-reported health status including longstanding illness and limiting longstanding illness if the health problem stopped the respondents from doing things they normally did. The GHQ 12 is a set of 12 general health questionnaires which covers feeling strain, depression, anxiety, insomnia and other mental distress symptoms. In this study, “GHQ case” is defined as one in which the respondent reported four or more symptoms. Polypharmacy or multiple medications as defined by taking concurrently 4 or more POM was also examined through a separate logistic regression model.

A stepwise variable selection procedure was used to find the ‘best’ fitted model from which estimates of odds ratios (OR) and corresponding 95% confidence intervals were calculated (LOGISTIC procedure SAS 8).

## **Results**

The 1998 HSE included 19,654 individuals and 3,273 were aged 65 and over. For various reasons, including non-response and away on the day of nurse visit, only 84% of these older people completed the nurse interview schedule which formed the second stage of the survey. The final number of older people available for the analysis was 2,750 and 56% of them were women.

Table 1 shows the characteristics of these older people. The women were older and 43% of them were from manual social class compared to 54% of the men, though 7% of the women in this sample had never worked before. Nearly half of the women lived alone but only one-third of them felt lack of social support. In contrast, only one-third of the men lived alone and 45% of them felt lack of social support. Health-wise, more older women than older men had minor depressive disorders and suffered from limiting longstanding illness which stopped them from doing things they normally did. The use of health services such as GP consultation and inpatient stay were very similar. However, older women had significantly more POM than older men. Eight one per cent of them had at least 1 POM by doctor compared to 74% in men and 30% of them were using 4 or more

medicines concurrently. This compares to only 26% in older men. For both sexes, multiple medications of 4 or more increased with age (Figure 1). However, for concurrent use of 2 or 3 drugs, the pattern is not very obvious.

Table 2 gives a breakdown of medicines taken and actual use in the past seven days before the interview by therapeutic group. Of the 2,147 older people who had at least one POM by doctor, 66% of them had medicines for circulatory problems, 38% for central nerves system, 24% for gastrointestinal system and 19% for musculoskeletal and joint disorders. Except for skin problems, over 90% of the medicines were used by the respondents during the past seven days before the interview.

The results from the 'best' fitted model for POM use obtained through stepwise selection procedure are shown in Table 3. Age, sex, longstanding illness, minor depressive symptom as estimated by GHQ case and the recent use of health services all have significant effects on POM use. Social class, living alone and perceived social support did not contribute significantly to the fit of the model. The final model is dominated by the effect of limiting longstanding illness with an odds ratio (OR) of 7.56 (95% confidence interval 5.80-9.86). Older women, having consulted GP during the last fortnight and the presence of minor depressive disorder had significantly higher odds ratios for POM use (OR=1.31, 2.55 and 2.47 respectively). Those who had inpatient stay in the last 12 months show marginal significant odds ratio than those who did not (OR=1.41, 0.97-2.04).

Table 4 shows the final model for polypharmacy. The stepwise logistic regression procedure produced a similar model. Again age, sex, longstanding illness and minor depressive disorder, recent use of health services are the significant explanatory variables for multiple medication. Concurrent use of four or more medicines is 27 times higher in older people with limiting longstanding illness than those who did not have longstanding illness.

## Discussion

The Health Survey for England (HSE) provides a unique source of information whereby the use of prescription only medicine can be linked to other socio-economic and socio-demographic variables allowing statistical modelling to be carried out to identify high risk groups. The use of a trained nurse for the second stage of the interview ensures the reliability of information collected on medicines used. The request from the nurse on actually seeing the medicines before coding them into BNF categories adds to the accuracy of the medical information collected.

However, the HSE only covers individuals living in non-institutional private household. Thus the sample of older people included in this analysis could be of a very selective, relatively functionally active group than those living in institutional setting such as nursing home. However, this analysis did highlight the high risk group of older people living in their own home on POM use especially on multiple medication. With increasing age, older people had more health problems which restricted their daily activities. Use of POM was significantly higher in those suffering from limiting longstanding illness and had minor psychiatric disorder and in those who had recently used the health services. Other socio-economic and socio-demographic factors did not seem to have differential effects on POM use. Multiple medication was particularly high among those who had limiting longstanding illness. Co-morbidity had been found to be one of the main reasons for developing polypharmacy<sup>10</sup> in the elderly population, a fact supported in this analysis.

In the next 30 years, England will see a significant increase in the number of older people. The problem of polypharmacy and the associated high risk of adverse drug reaction will no doubt add to the burden on the health care resources which has already been stretched to the limit to cope with the rising cost of elderly care.

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Table 1. Characteristics of the sample of 2750 older people

	<b>Men</b>	<b>Women</b>
Age (mean)	73.5	74.6
Living alone (%)	33	47
Manual class (%)	54	43
Perceived lack of social support (%)	45	33
GHQ cases (%)	12	16
Limiting longstanding illness (%)	45	47
GP consultation last fortnight (%)	20	21
Inpatient stay last 12 months (%)	16	15
Use at least 1 POM by doctor (%)	74	81
Use 4 or more POM by doctor (%)	26	30

Table 2. Prescription-only medicines by doctor and used in the last 7 days before the interview by BNF chapter

<b>BNF chapters</b>	<b>POM by doctor</b>	<b>Used in the last 7 days</b>	<b>(%)</b>
Cardiovascular system	1417	1394	98
Gastrointestinal system	523	496	95
Respiratory system	316	301	95
Central nerves system	815	765	94
Infections	69	67	97
Endocrine system	370	366	99
Gynaecologic/Urinary disorder	370	366	99
Malignant diseases	49	44	90
Nutrition and blood	149	136	91
Musculoskeletal and joint disorders	416	386	93
Eye/Ear	162	151	93
Skin	101	88	87
All taking POM by doctor	2147	2147	

Table 3. Estimated odds ratios (age adjusted) for use of POM and their 95% confidence intervals

	<b>Odds ratio</b>	<b>95% confidence interval</b>
Women	1.31	1.05 – 1.62
Longstanding illness	4.85	3.67 – 6.42
Limiting longstanding illness	7.56	5.80 – 9.86
GP consultation	2.55	1.80 – 3.62
Inpatient stay	1.41	0.97 – 2.04
GHQ case	2.47	1.53 – 4.01

Table 4. Estimated odds ratios (age adjusted) for polypharmacy and their 95% confidence intervals

	<b>Odds ratio</b>	<b>95% confidence interval</b>
Women	1.36	0.99 – 1.87
Limiting longstanding illness	9.29	6.07 – 14.22
Limiting longstanding illness	27.48	18.58 – 40.64
GP consultation	3.24	2.01 – 5.11
Inpatient stay	2.14	1.36 – 3.35
GHQ case	2.46	1.41 – 4.30

Figure 1. Number of prescription-only medicines (POM) by age and sex

