Health Survey for England 2016 Prescribed medicines

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This report uses data from 2015 and 2016 to examine the use of prescribed medicines by adults living in their own homes in England. It provides information on the number of prescribed medicines taken in the last week, and the proportion of the population taking specific classes of medicines, by socio-demographic and health factors.

Key findings

- In 2015/16 48% of adults had taken at least one prescribed medicine (not including contraception or nicotine replacement therapy) in the last week. This increased with age from 19% of young adults aged 16 to 24 to more than 90% of those aged 75 and over. The proportion of adults taking one or more prescribed medicines was similar to 2012/13.

- In 2015/16, 24% of adults were taking three or more medicines.

- The prevalence of prescribed medicine use was higher in more deprived areas: 54% of adults in the most deprived fifth of areas took at least one medicine, compared with 45% in the least deprived areas.

- Prescribed medicine use was much higher than average among those with self-reported bad or very bad general health (85%), a limiting or non-limiting longstanding condition (76% and 71% respectively), or probable mental ill health (63%).

- The most commonly used prescribed medicines were antihypertensives (by 15% of adults) and lipid-lowering medicines (14%); followed by proton-pump inhibitors for reducing acid in the stomach (11%); analgesics and non-steroidal anti-inflammatory drugs (11%); and antidepressants (10%).

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This report may be of interest to members of the public, policy officials, people working in public health and to commissioners of health and care services to see the prevalence and patterns of prescribed medicine use among adults in England.

Introduction

Contents

This report examines the use of prescribed medicines in the last week by adults living in their own homes in England in 2015 and 2016. It provides information on the number of prescribed medicines taken by age, sex, region, area deprivation, longstanding illness, social care needs, general health, and abdominal obesity. It also examines prescribed medicine use and the proportion of the population taking specific classes of medicines by age and sex and by two measures of health: kidney function and General Health Questionnaire (GHQ-12) score,[1] an indicator of probable mental ill health.

Background

Prescribing is the most common clinical intervention in the NHS.[2] The total cost at list price of prescriptions dispensed in the community in 2016 was £9.2 billion.[3] The number of prescribed medicines supplied in primary care in England has increased steadily year on year. The total number of items dispensed in 2016 was over 1,104 million, an increase of 1.9% (20.5 million additional items) on the number dispensed in 2015. The average number of prescription items per head of the population in 2016 was 20.0, compared with 19.8 items in the previous year. The therapeutic area showing the greatest numeric rise since 2015 was antidepressants, with an increase of 3.7 million items (6.0%).[3]

The number of prescription items dispensed increased from 2006 to 2016, by 47%; the average number of prescription items per person per year has risen by 35% over this period from 14.8. The use of medicines to treat cardiovascular disease and respiratory disease has increased by 36% and 38% respectively over these 10 years, based on prescriptions dispensed in the community in England.[3]

Prescribed medicines are subject to a prescription charge but many people are eligible to receive prescriptions free of charge, if they meet certain exemption criteria. In addition, some categories of prescribed items are exempt, including contraception and items administered in some NHS settings or for certain conditions.[4] In 2016, 89.4% of prescriptions dispensed in the community were free of charge.[3]

The Carter Review, published in February 2016, included a review of pharmacy services and medicines in secondary care. The report noted the cost of medicines in hospitals was increasing at a rate of 15% per annum as more complex and specialist

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[1] The tables based on GHQ-12 data use data from HSE 2014 and 2016, as GHQ-12 was not included in HSE 2015.

[2] National Institute for Health and Care Excellence *Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes (NG5)* London, NICE, 2015.
https://www.nice.org.uk/guidance/ng5

[3] NHS Digital. *Prescription Cost Analysis: prescriptions dispensed in the community, 2016.* Leeds, NHS digital, 2017. www.gov.uk/government/statistics/prescription-cost-analysis-england-2016. Note that cost at list price is the basic cost of a drug excluding VAT and is not necessarily the price the NHS paid. It does not take account of any contract prices or discounts, dispensing costs, fees or prescription charges income, so the amount the NHS paid will be different.

[4] For a full list of current exemptions see
www.nhs.uk/NHSEngland/Healthcosts/Pages/Prescriptioncosts.aspx

medicines enter the market, mainly for the treatment of cancer and immune-related conditions.[5]

A driver for this increased use of medicines is guidance from the National Institute for Health and Care Excellence (NICE), including clinical guidelines and medicine technology appraisals.[6] These have generally been developed for managing individual diseases and conditions. Medicines Optimisation is the national strategy aimed at ensuring the safe and effective use of medicines to enable the best possible outcomes for patients. NICE published a national guideline on Medicines Optimisation in March 2015.[7]

One focus of this report is the use of prescribed medicines among people with impaired renal (kidney) function. As described in the HSE 2016 report on Kidney and Liver disease, two of the main causes of kidney disease are diabetes and hypertension (longstanding raised blood pressure).[8] NICE guidelines recommend that patients with diabetes are prescribed medicines that affect the renin-angiotensin system[9] that reduce blood pressure and protect the kidney against the renal damage that can be caused by diabetes.[10] It is recommended that patients with confirmed hypertension that does not respond to lifestyle changes (with BP 160/100mmHg or more, or 140/90mmHg or above if there is existing cardiovascular, kidney or other organ damage, diabetes, or high risk of developing cardiovascular disease) are prescribed antihypertensive medication, using a stepwise approach to use of various classes of antihypertensive medicines, with the specific choice depending on age and ethnicity.[11,12]

NICE clinical guidelines for people with existing chronic kidney disease (CKD) include keeping blood pressure (BP) below 140/90mmHg (aiming at systolic BP 120-129mmHg and diastolic BP less than 80mmHg in people who also have diabetes or have albuminuria), using a single, low-cost, renin-angiotensin antagonist. They also recommend that people with CKD should take antiplatelet medicines for the secondary

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[5] Lord Carter of Coles. *Operational productivity and performance in English NHS acute hospitals: Unwarranted variations.* London, Department of Health, 2016. www.gov.uk/government/uploads/system/uploads/attachment_data/file/499229/Operational_productivity_A.pdf

[6] NICE guidelines are evidence-based recommendations for health and care in England. They set out the care and services suitable for most people with a specific condition or need, and people in particular circumstances or settings. The technology appraisal programme gives recommendations on the use of new and existing medicines and treatments in the NHS.

[7] National Institute for Health and Clinical Excellence. *Medicines Optimisation: the safe and effective use of medicines to enable the best possible outcomes. NICE Guideline NG5.* London, NICE, 2016. www.nice.org.uk/guidance/ng5

[8] Ng Fat L, Mindell J, Roderick P. *Health Survey for England 2016. Kidney and liver disease.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[9] Angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), or renin inhibitors.

[10] National Institute for Health and Clinical Excellence. *Type 2 diabetes in adults: management. Clinical guideline CG28.* London, NICE, 2015. www.nice.org.uk/guidance/ng28

[11] National Institute for Health and Clinical Excellence. *Hypertension in adults: diagnosis and management. Clinical guideline CG127* London, NICE, 2015. www.nice.org.uk/guidance/cg127

[12] For example, patients under 55, except for those of African or Caribbean family origin, should start with a medicine affecting the renin-angiotensin system.

prevention of cardiovascular disease (CVD)[13] and follow other guidance for people at particular risk of developing CVD.[14] Acute kidney injury can also be caused, or kidney damage exacerbated, by use of non-steroidal anti-inflammatory drugs (NSAIDs, including aspirin); these medicines account for about 15% of all cases of drug-induced acute kidney failure.[15]

Methods and definitions

Methods

At the nurse visit, participants were asked: 'Are you taking or using any medicines, pills, syrups, ointments, puffers or injections prescribed for you by a doctor or nurse?' Those who did were then asked the name of each prescribed item. Participants were asked to show the nurse the actual medicine pack. These were coded by the nurse into medicine classes based on the sub-sections of the British National Formulary (BNF) edition 68.[16] Up to 22 medicines could be recorded (including contraception). For each medicine, a follow up question asked whether they had taken or used that medicine in the last seven days.

A few medicines had two or more possible BNF codes, depending on the formulation (e.g. steroid cream or inhaler), dose, or reason for taking it. This applied particularly to aspirin, which could be coded as being for arthritis, general analgesia (pain relief), or low dose aspirin for CVD prevention. For certain medicines, an additional question was also asked about the reason for that treatment. For example, participants taking cardiovascular medicines were asked whether it was taken to treat hypertension, heart disease, or for another reason.

Definitions

Prescribed medicine

This report on prescribed medicine excludes both smoking cessation products (nicotine and other medicine) and contraception.

Analyses of prescribed medicine are restricted to those reported to have been taken in the last seven days. Throughout the report this is described as 'medicine taken in the last week'.

Table A describes the types of medicine and the sections of the British National Formulary (BNF edition 68) included for each class of medicine in the later tables in this report.

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[13] National Institute for Health and Clinical Excellence. *Chronic kidney disease in adults: assessment and management. Clinical guideline CG182.* London, NICE, 2015. www.nice.org.uk/guidance/cg182

[14] National Institute for Health and Clinical Excellence. *Cardiovascular disease: risk assessment and reduction, including lipid modification. Clinical guideline CG181.* London, NICE, 2015. www.nice.org.uk/guidance/cg181

[15] Medicines and Healthcare projects Regulatory Agency. *Non-steroidal anti-inflammatory drugs (NSAIDs): reminder on renal failure and impairment.* MHRA, 2009. https://www.gov.uk/drug-safety-update/non-steroidal-anti-inflammatory-drugs-nsaids-reminder-on-renal-failure-and-impairment

[16] *British National Formulary.* www.bnf.org

Table A: Definitions of medicine classes used in this report[a]

Class	Medicines included	BNF[b] sections
Antihypertensive medicines (to reduce blood pressure)	Diuretics, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), renin inhibitors, calcium blockers, other antihypertensive medicines; but only if being taken for hypertension	2.2, 2.4, 2.5, 2.6.2
Diuretics (to reduce fluid retention or high blood pressure)	Thiazides; loop, potassium sparing, osmotic, and mercurial diuretics; carbonic anhydrase inhibitors, diuretics with potassium.	2.2.1 to 2.2.8
Renin-angiotensin-aldosterone system antagonists (to treat heart failure and reduce blood pressure)	Angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), renin inhibitors	2.5.5
Lipid-lowering medicines (to lower cholesterol and triglycerides)	Statins, other lipid-lowering medicines	2.12
Antiplatelet medicines (to reduce clotting)	Antiplatelet medicines, including low dose aspirin, clopidogrel, dipyridamole, prasugrel, ticagrelor, glycoprotein IIb/IIIa inhibitors	2.9
Proton pump inhibitors (to reduce acid in the stomach)	Proton pump inhibitors (e.g. omeprazole)	1.3.5
Painkillers and non-steroidal anti-inflammatory drugs	Non-opioid analgesics, opioid analgesics, medicines for neuropathic pain, antimigraine medicines, non-steroidal anti-inflammatory drugs (NSAIDs), including topical NSAIDs	4.7, 10.1.1, 10.3.2
Non-steroidal anti-inflammatory drugs	NSAIDs, including topical NSAIDs	10.1.1
Antidepressant medicines	Tricyclics and related therapy, monoamine-oxidase inhibitors (MAOIs), selective serotonin re-uptake inhibitors (SSRIs), other antidepressants	4.3

Table A (continued)

Class	Medicines included	BNF[b] sections
Anxiolytic and hypnotic medicines (to reduce anxiety or insomnia)	Benzodiazepines, non-benzodiazepine anxiolytics (buspirone, meprobamate), non-benzodiazepine hypnotics (zaleplon, zolpidem, zopiclone; chloral hydrate; clomethiazole; antihistamines; sodium oxybate; melatonin), barbiturates	4.1
Antipsychotic medicines	First and second generation antipsychotic medicines, including depot injections within last four weeks (e.g. haloperidol, chlorpromazine, trifluoperazine, olanzapine, risperidone, quetiapine); and medicines used for mania and hypomania (e.g. asepenine, valproate, lithium).	4.2
Medicines for asthma or chronic obstructive pulmonary disease (COPD)	Bronchodilators, inhaled corticosteroids, cromoglicate and related therapy, leukotriene receptor antagonists, phosphodiesterase type-4 inhibitors, oxygen	3.1, 3.2, 3.3, 3.6
Antidiabetic medicines	Insulin and oral antidiabetic medicines: sulfonylureas, biguanides and other antidiabetic medicines.	6.1.1, 6.1.2

[a] Medicines were included only if the participant reported they had taken them in the last week.

[b] BNF: British National Formulary edition 68.

Specific health conditions

General health and longstanding illness
General health status was assessed in response to the question 'How is your health in general?' with the answer categories very good, good, fair, bad and very bad.

Longstanding illness was defined as any physical or mental health conditions or illnesses lasting or expected to last 12 months or more. Longstanding illness was considered to be limiting if it reduced an individual's ability to carry out day-to-day activities.

Data for general health and longstanding illness have been age-standardised (see below).

Need for social care
Participants aged 65 and over were asked about their ability to do a range of activities of daily living (ADLs) such as getting up and down stairs, having a bath or a shower, and dressing or undressing. Those not needing help (72% of this age group) could do all these activities without difficulty. Those needing help were defined as those who

said they could do an activity but with difficulty, those who could do it only with help, and those who were unable to do it.[17]

Waist circumference

Body Mass Index (BMI) does not distinguish between mass due to body fat and mass due to muscular physique, nor the distribution of fat. In order to measure abdominal obesity, waist circumference is measured, and categorised into desirable, high and very high, by sex-specific thresholds.[18]

Table B: Classification of waist circumference in centimetres

Men	Women	Description
Less than 94	Less than 80	Desirable
94-102	80-88	High
More than 102	More than 88	Very high

See the HSE 2016 Adult Overweight and Obesity report for further information about using waist measurement as an indicator of obesity.[19]

Data for waist circumference have been age-standardised (see below).

Kidney disease

This report includes examination of use of prescribed medicines by renal function category. Renal function was categorised using estimated glomerular filtration rate (eGFR) based on serum creatinine measurement ascertained from a blood sample taken at the nurse visit (eGFR$_{creat}$). Survey participants were categorised as: normal (eGFR$_{creat}$ at least 90 ml/min/1.73m^2); mildly decreased renal function (eGFR$_{creat}$ 60-89 ml/min/1.73m^2); and moderately to severely decreased (eGFR$_{creat}$ less than 60 ml/min/1.73m^2). For more details on eGFR, see the HSE 2016 Kidney and Liver disease report.[20]

Mental health

Mental health status was ascertained using the 12-item General Health Questionnaire (GHQ-12) self-completion questionnaire. The GHQ-12 is a widely used and validated measure of mental health. It was originally intended for use in general practice settings as a screening instrument for general, non-psychotic psychiatric morbidity (probable mental ill health), and should not be used to diagnose specific psychiatric problems.[21] Survey participants were categorised as scoring 0 (indicating no evidence of probable mental ill health), 1 to 3 (indicating less than optimal mental health), and 4

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[17] For more information on the need and receipt of social care among adults aged over 65, see Brown L, Sondaal A. *Health Survey for England 2016. Social care for older adults.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[18] World Health Organization, 2000. *Obesity: preventing and managing the global epidemic* (No. 894). World Health Organization.

[19] Conolly A, Saunders C. *Health Survey for England 2016. Adult overweight and obesity.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[20] Ng Fat L, Mindell J, Roderick P. *Health Survey for England 2016. Kidney and liver disease.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[21] Goldberg D, Williams PA. *User Guide to the General Health Questionnaire.* NFER-Nelson, Windsor, UK, 1988.

or more (indicating probable psychological disturbance or mental ill health).[22] For further details about the GHQ-12 and its use, see the HSE 2016 Well-being report.[22]

Data for GHQ-12 have been age-standardised (see below).

Index of Multiple Deprivation

The English Indices of Deprivation 2015, which measure and rank local levels of deprivation, are calculated by the Department for Communities and Local Government. The indices are based on 37 indicators, across seven domains of deprivation.[23] The Index of Multiple Deprivation (IMD) is a measure of the overall deprivation experienced by people living in a neighbourhood.[24]

In this publication IMD rankings have been split into quintiles. The lowest quintile indicates the lowest levels of deprivation; the highest quintile indicates that the neighbourhood experiences the highest levels of deprivation. Not everyone who lives in a deprived neighbourhood will be deprived themselves.

Data for IMD have been age-standardised (see below).

Age-standardisation

Age-standardised data are presented in this report for some analyses shown in the text, tables and charts where appropriate. Age-standardisation allows comparisons between groups after adjusting for the effects of any differences in their age distributions.

For regions, both observed and age-standardised data are provided. Those wishing to ascertain the actual levels of prescribed medicine use in each region should use the observed data, while those making comparisons between regions should use the age-standardised data. The comments on region in this report are based on age-standardised results.

About the survey estimates

The Health Survey for England, in common with other surveys, collects information from a sample of the population. The sample is designed to represent the whole population as accurately as possible within practical constraints, such as time and cost. Consequently, statistics based on the survey are estimates, rather than precise figures, and are subject to a margin of error, also known as a 95% confidence interval. For example the survey estimate might be 24% with a 95% confidence interval of 22% to 26%. A different sample might have given a different estimate, but we expect that the true value of the statistic in the population would be within the range given by the 95% confidence interval in 95 cases out of 100.

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[22] Morris S, Earl K. *Health Survey for England 2016. Well-being and mental health.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[23] The seven domains used to calculate IMD are: income deprivation; employment deprivation; health deprivation and disability; education; skills and training deprivation; crime; barriers to housing and services; and living environment deprivation.

[24] Department for Communities and Local Government. *The English Indices of Deprivation 2015,* London, 2015. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/465791/English_Indices_of_Deprivation_2015_-_Statistical_Release.pdf.

Where differences are commented on in this report, these reflect the same degree of certainty that these differences are real, and not just within the margins of sampling error. These differences can be described as statistically significant.[25]

Confidence intervals are quoted for key statistics within this report and are also shown in more detail in the Excel tables accompanying the Methods report.[26] Confidence intervals are affected by the size of the sample on which the estimate is based. Generally, the larger the sample, the smaller the confidence interval, and hence the more precise the estimate.

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[25] Statistical significance does not imply substantive importance; differences that are statistically significant are not necessarily meaningful or relevant.
[26] *Health Survey for England 2016: methods.* Leeds, NHS Digital, 2017, available via
https://digital.nhs.uk/pubs/hse2016.

Prevalence of taking prescribed medicines

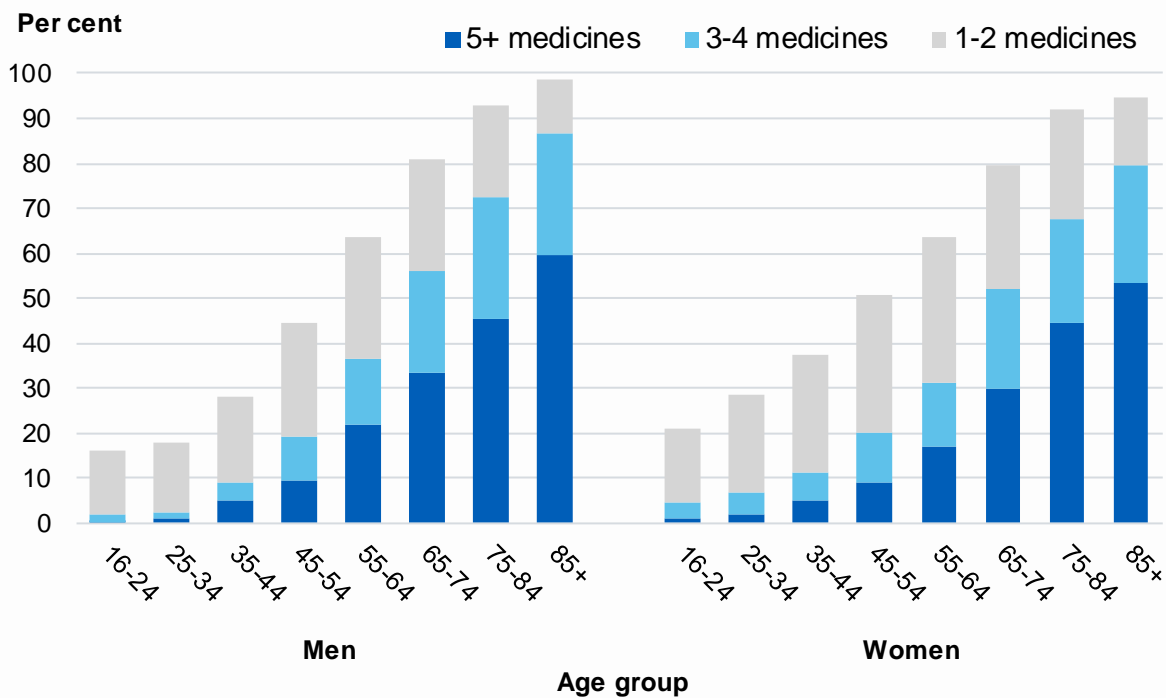## Prescribed medicine use, by age and sex

Nearly half, 48%, of adults had taken at least one prescribed medicine in the last week, and almost a quarter, 24%, had taken three or more.

Prescribed medicine use increased with age. 19% of young adults aged 16 to 24 had taken one or more medicines in the last week, and this increased to more than 90% of those aged 75 and over. This increase was steeper for men than it was for women. Up to the age of 54, women were more likely than men to use prescribed medicine, but among adults aged 55 and over, this difference was no longer apparent. The prevalence of taking three or more medicines also rose sharply with age, from 3% of those aged 16 to 24 to 82% of those aged 85 and over. The use of five or more medicines increased greatly through middle and older age, from 9% of those aged 45 to 54 to 56% of those aged 85 and over.

Figure 1, Table 1

Figure 1: Number of prescribed medicines taken in the last week, by age and sex

Base: Aged 16 and over with a nurse visit

Source: NHS Digital

Prescribed medicine use, by region

The prevalence of prescribed medicine use varied slightly across the nine regions. Once age was taken into account, the proportion taking one or more medicines in the last week was highest in the North West (52%) and North East (50%) and lowest in London (43%). The North East had the highest proportion of adults taking three or more medicines (28%), while London and the South East had the lowest (22%). This pattern was broadly similar in men and women.

Figure 2, Table 2

Figure 2: Prescribed medicine use in the last week, by region (age-standardised)

Base: Aged 16 and over with a nurse visit
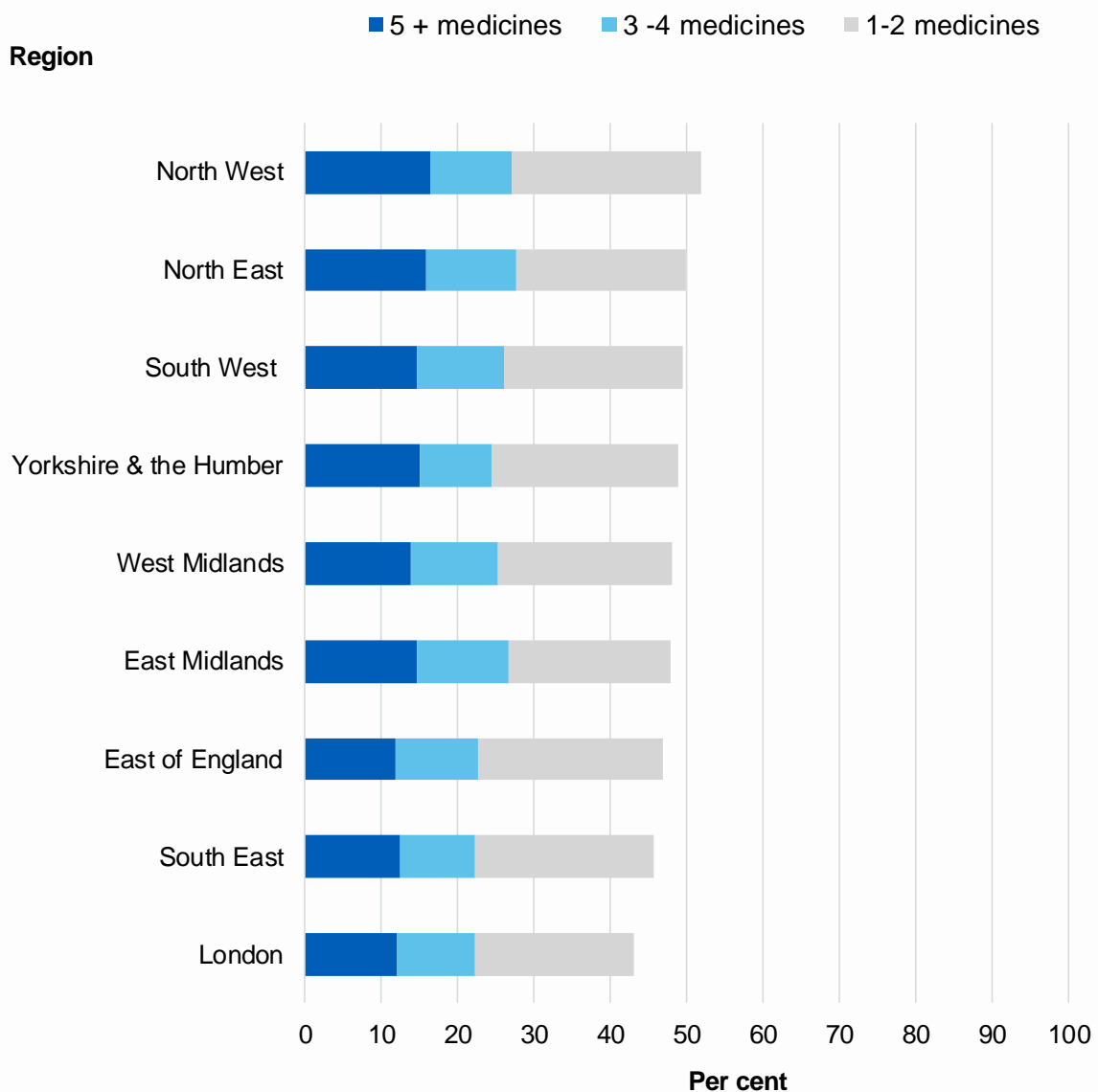
Source: NHS Digital

Prescribed medicine use, by Index of Multiple Derivation (IMD)

Medicine use was higher in the more deprived areas; once age was taken into account, in the most deprived fifth of areas, 54% of adults took at least one prescribed medicine and 32% took three or more, compared with the least deprived fifth of areas, where 45% of adults took at least one prescribed medicine and 20% took three or more.

Figure 3, Table 3

Figure 3: Age-standardised number of prescribed medicines used in the last week, by IMD

Base: Aged 16 and over with nurse visit

Source: NHS Digital
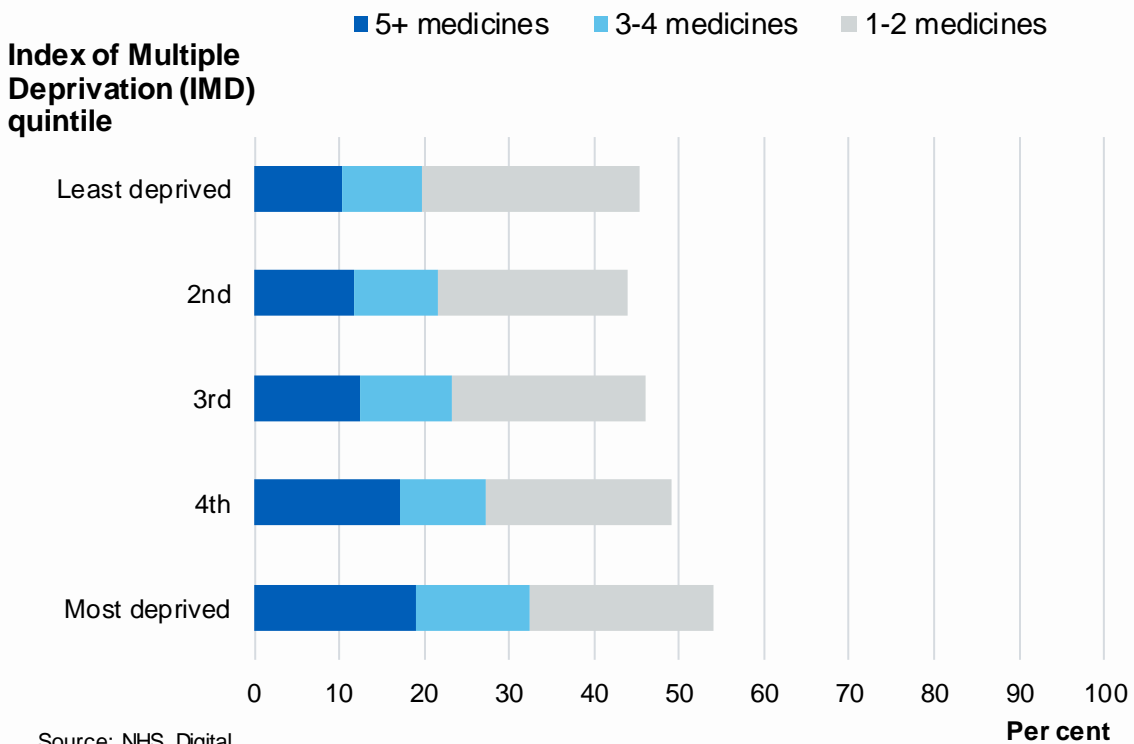
# Prescribed medicines and health conditions

Prescribed medicine use, by general health and longstanding illness

For information on the measurement of general health and longstanding illness, see the introduction to this report. After controlling for age, self-reported general health status was closely associated with use of prescribed medicines in the last week. While 40% of those reporting very good or good general health had used at least one prescribed medicine, the proportion was 85% of those in bad or very bad general health. Those in bad or very bad general health were also much more likely to be taking three or more medicines compared with those in very good or good general health (62% and 17% respectively).

Figure 4, Table 4

Figure 4: Age-standardised number of prescribed medicines used in the last week, by general health and sex

Base: Aged 16 and over with nurse visit
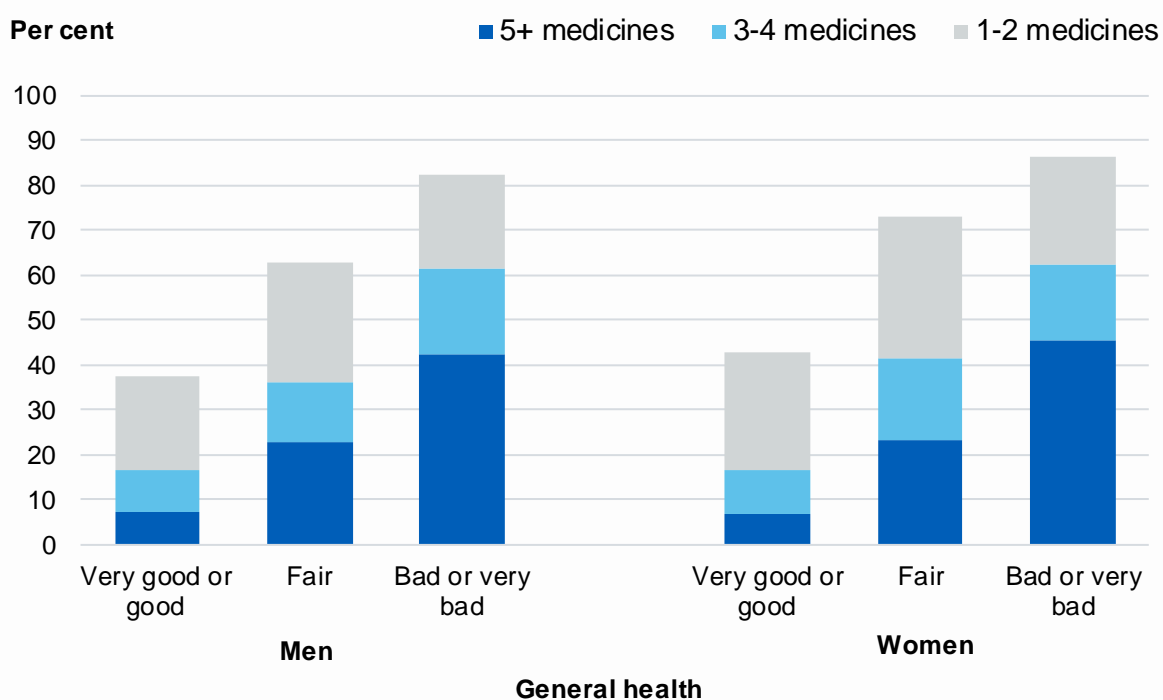
Source: NHS Digital

Longstanding illness was associated with prescribed medicine use in the last week, after controlling for age. 31% of adults reporting no longstanding illness used at least one prescribed medicine, compared with 71% of those with a non-limiting longstanding illness and 76% of those with a limiting longstanding illness.

Table 5

Prescribed medicine use, by need for social care

HSE in 2016, in common with previous years, asked about older adults' need for help with a range of activities of daily living (ADLs). For information see the Introduction to this report and the HSE 2016 Social Care for Older People report.[27] 28% of adults aged 65 and over needed help with ADLs to some degree.

Adults aged 65 and over are more likely to need social care as age advances. They are also very likely to have used at least one prescribed medicine in the last week; this proportion increased with age from 80% of those aged 65 to 74 to 96% of those aged 85 and over.

Table 1

Among adults aged 65 and over, almost all of those who had need of social care were using a prescribed medicine; 95%, compared with 84% of those without need for social care. The pattern was slightly different for men and women; among those with no need for social care, medicine use was higher for men, but for those with some need for social care, medicine use was higher among women. Older adults in need of social care were also more likely to be using three or more prescribed medicines; 84%, compared with 56% of those with no need for social care. 67% of those with met or unmet needs were using five or more prescribed medicines, compared with 30% of older adults without ADL needs.

Figure 5, Table 6

Figure 5: Age-standardised number of prescribed medicines used in the last week, by need for social care and sex
Base: Aged 65 and over with nurse visit
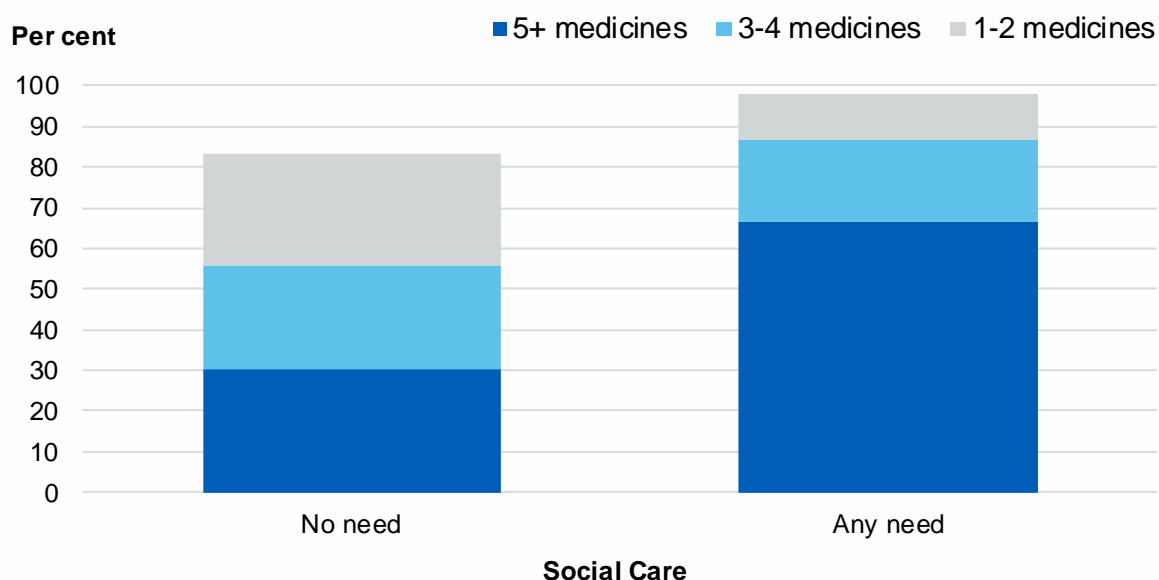
Source: NHS Digital

## Prescribed medicine use, by waist circumference

In 2013, the current use of prescribed medicines was associated with body mass index (BMI), with a higher prevalence of use among overweight and obese adults.[28] Waist circumference is an alternative measure of obesity, specifically abdominal obesity. For information on how this is defined see the Introduction to this report and the HSE Adult Overweight and Obesity report.[29] In 2016, 34% of men and 46% of women had a very high waist circumference. A further 24% of men and 22% of women had a high waist circumference.[29]

After controlling for age, as with BMI, waist circumference was associated with prescribed medicine use, particularly for women. While 39% of women with a desirable waist circumference had used a prescribed medicine in the last week, 57% of women with a very high waist circumference had done so. For men, there was a similar but less pronounced pattern; 38% and 48% respectively. The pattern for taking three or more medicines also showed a strong association with waist circumference, again particularly for women: 14% of those with a desirable waist circumference had taken three or more medicines, whilst 32% of those with a very high waist circumference had done so. For men the figures were 18% and 29% respectively.

Figure 6, Table 7

Figure 6: Age-standardised number of prescribed medicines used in the last week, by waist circumference category and sex
Base: Aged 16 and over with nurse visit
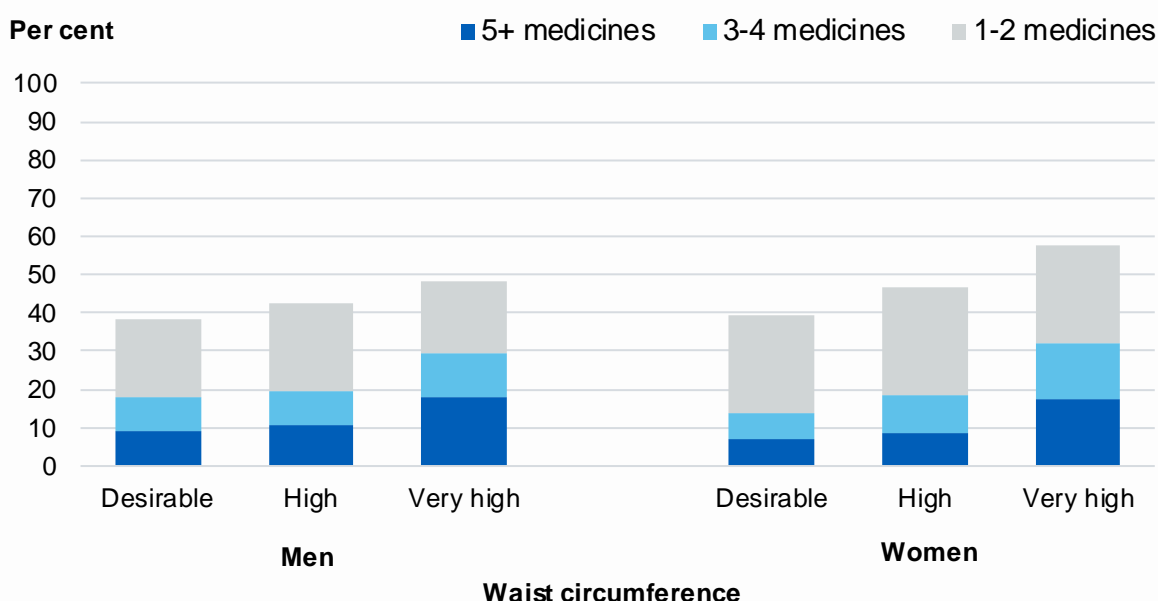
Source: NHS Digital

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[28] Scholes S, Faulding S, Mindell J. *Use of prescribed medicines.* Chapter 5 in Craig R, Mindell J (eds). *Health Survey for England 2013*. Health and Social Care Information Centre, Leeds, 2014.

[29] Conolly A, Saunders C. *Health Survey for England 2016. Adult overweight and obesity.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

Prescribed medicine use, by renal function

Renal function was normal in 26% of adults aged 45 and over, mildly decreased in 61%, and moderately to severely decreased in 11%. Adults aged 16 to 44 were not included in this analysis due to the rarity of moderate to severely decreased renal function in this age group (below 1%). For further details on kidney disease, see the HSE 2016 Kidney and Liver disease report.[30]

After controlling for age, prescribed medicine use was higher in those with poorer renal function. While 67% of adults with normal kidney function had taken a prescribed medicine within the last week, 86% of those with an $eGFR_{creat}$ level less than 60ml/min/1.73m^2, indicating abnormal kidney function, had done so. Similarly those with moderate to severely decreased renal function were also more likely to take three or more medicines.

Table 8

Two medicine groups were particularly associated with decreased kidney function: anti-hypertensives and renin-angiotensin-aldosterone system antagonists. Antidiabetic medicines were more common in people with normal or moderately to severely decreased renal function than among those with mildly decreased renal function. There was no such relationship between levels of kidney function and the use of diuretics or NSAIDs.

Figure 7, Table 9

Figure 7: Age-standardised prescribed medicine use in the last week, by kidney disease status and sex

Base: Aged 45 and over with blood sample
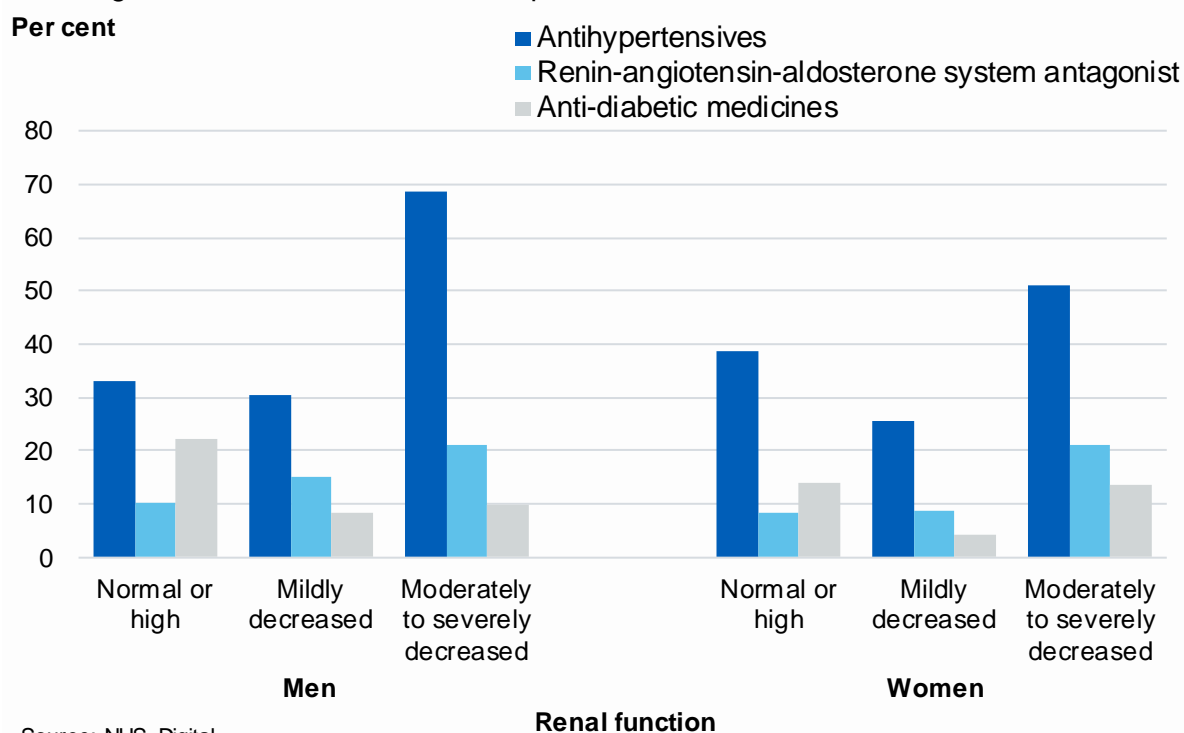
Source: NHS Digital

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[30] Ng Fat L, Mindell J, Roderick P. *Health Survey for England 2016. Kidney and liver disease.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

Prescribed medicine use, by mental health status

As described in the Methods and definitions section of this report, mental health status was assessed using the GHQ-12. A GHQ-12 score of 0 indicates no evidence of probable mental ill health; a score of 1 to 3 indicates less than optimal mental health, and a score of 4 or more indicates probable psychological disturbance or mental ill health.

In 2016, more than half (54%) of adults had a GHQ-12 score of 0, 28% had a score of 1 to 3, and 19% had a score of 4 or more, indicative of probable mental ill health. For further details about the GHQ-12, see the HSE 2016 Well-being report.[31]

After controlling for age, prescribed medicine use increased with GHQ-12 score. 42% of those with a GHQ-12 score of zero (no evidence of probable mental ill health) had taken a prescribed medicine in the last week; this rose to 63% of those with a score of 4 or more (indicating probable mental ill health).

Table 10

Prescribed mental health medicine use[32] increased with GHQ-12 score from 6% of those with a GHQ-12 score of 0 to 24% of those with a GHQ-12 score of 4 or more, and was higher among women (28% of women scoring 4 or more) than men (19%). The most common category of mental health medicine taken was antidepressants (22% of those with probable mental ill health, higher among those women, 26%, than men, 15%). Antipsychotic medicines, hypnotics and anxiolytics were taken far less commonly than antidepressants, but also showed a similar relationship with GHQ-12 score.

Figure 8, Table 11

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[31] Morris S, Earl K. *Health Survey for England 2016. Well-being and mental health.* Leeds, NHS Digital, 2017, available via https://digital.nhs.uk/pubs/hse2016.

[32] Prescribed medicines for mental health were antidepressants, anxiolytics and hypnotics, and antipsychotic medicines.

Figure 8: Age-standardised prescribed medicine use in the last week, by GHQ-12 score and sex

Base: Aged 16 and over with nurse visit
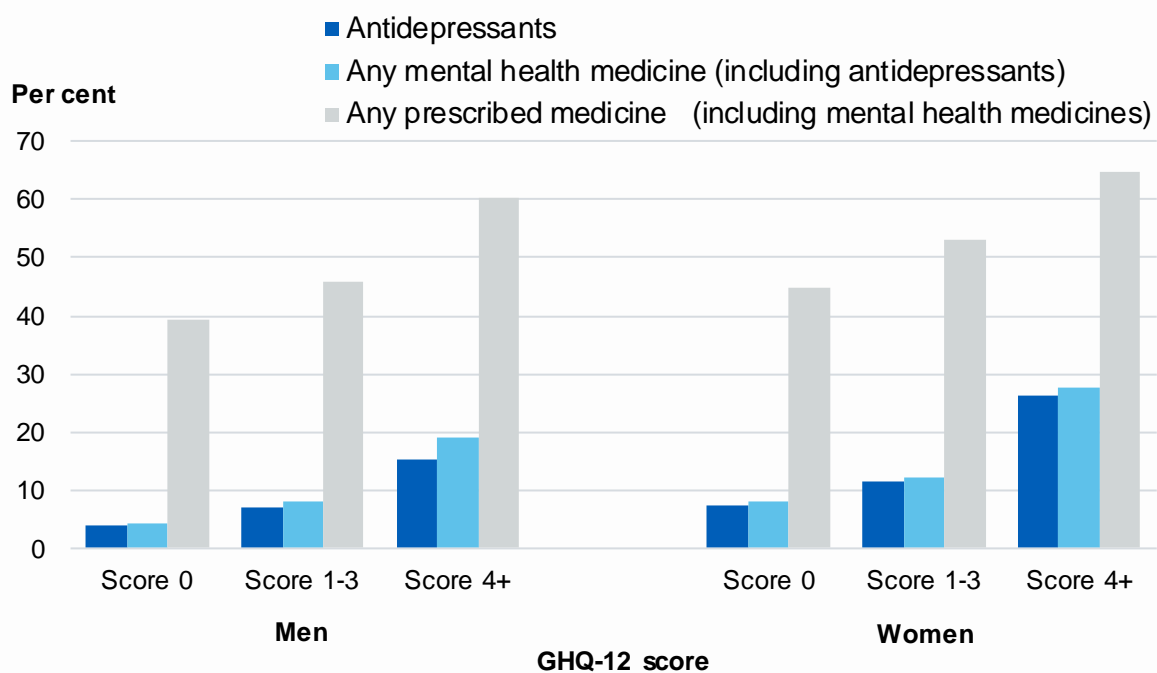
Source: NHS Digital

Use of specific classes of prescribed medicines

The most commonly used medicines were anti-hypertensives (15%) and lipid-lowering medicines (14%); followed by proton-pump inhibitors and analgesics/NSAIDs (11% each), and antidepressants (10%). Medicines for asthma/COPD, antiplatelet medicines, and antidiabetic medicines were also each used by at least 5% of adults.

Use of each medicine category increased with age, particularly for lipid-lowering medicines, anti-hypertensives, and anti-platelets. Other medicines such as antidepressants and those for asthma/COPD did not rise as much with age.

Prescribed lipid-lowering medicines, antiplatelet medicines and antidiabetic medicines were more commonly taken by men; antidepressants and analgesics were taken more commonly by women.

Figure 9, Table 12

Figure 9: Prescribed medicine use within specific classes, by sex

Base: Aged 16 and over with a nurse visit
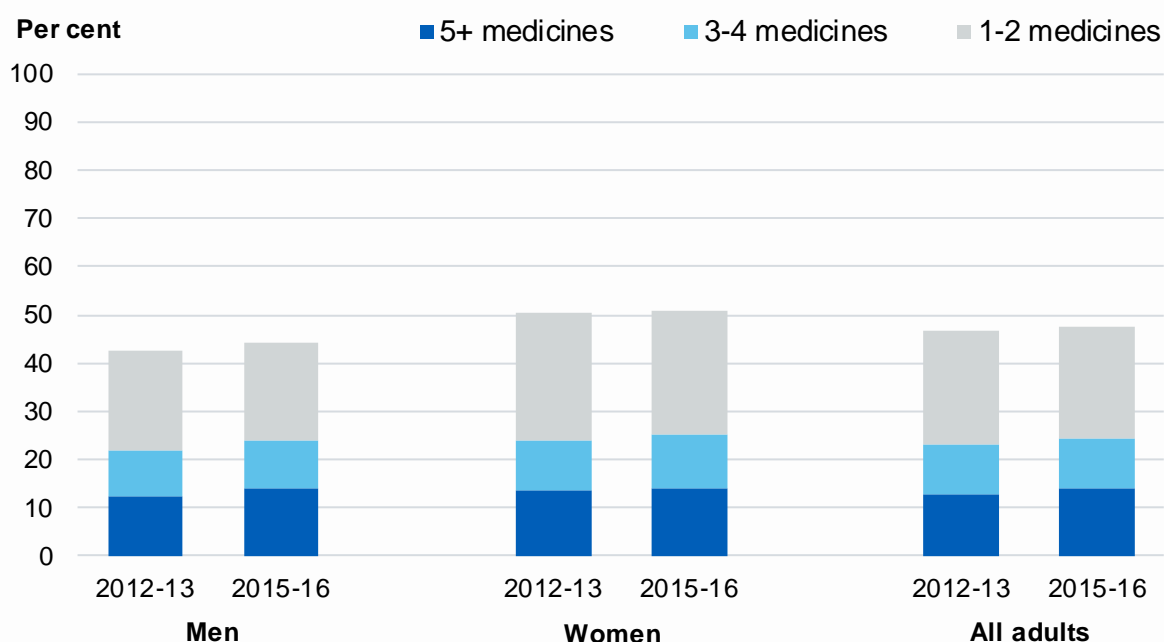

Source: NHS Digital
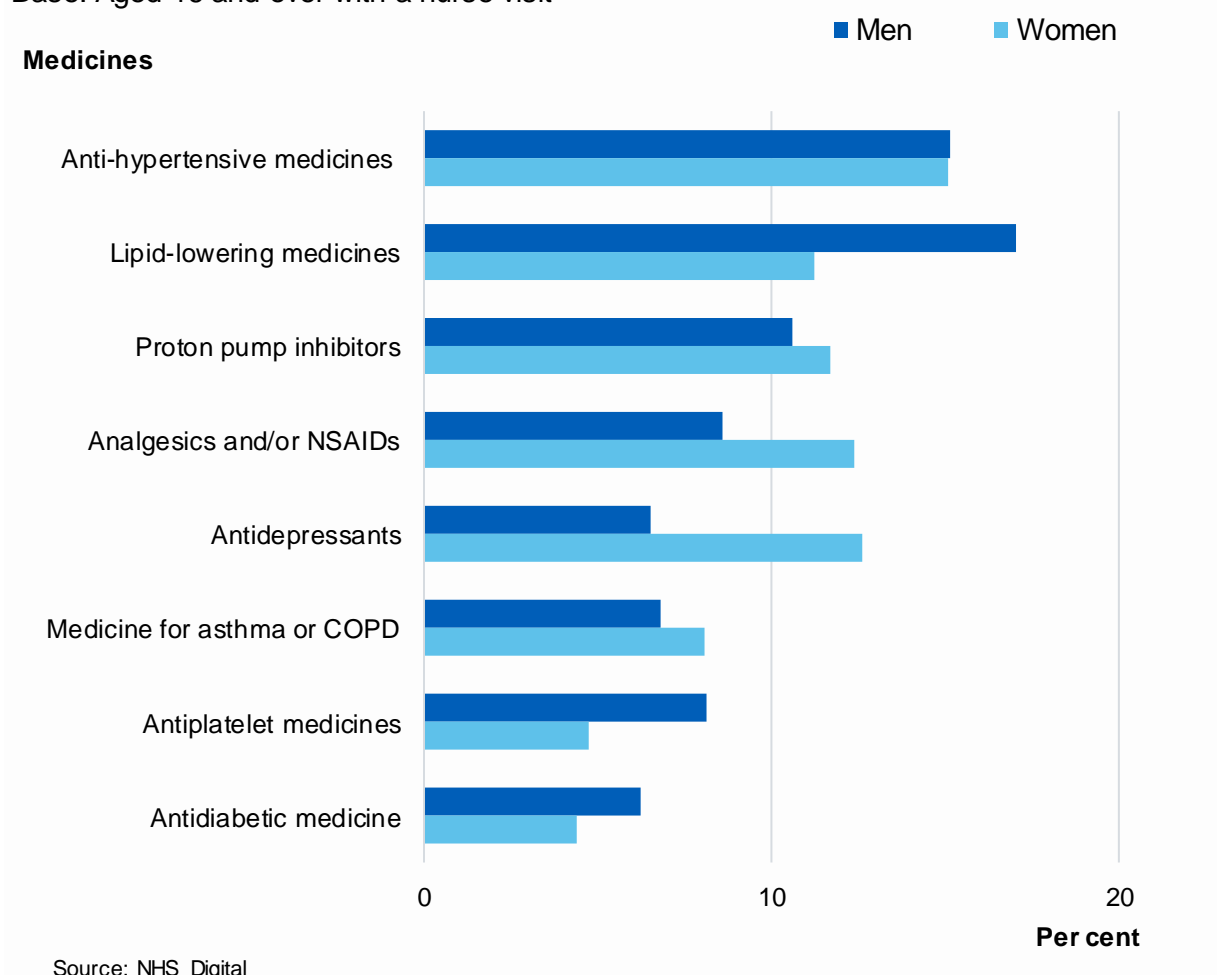
Comparisons with prescribed medicine use in 2012/13

The proportion of adults taking one or more medicines in the last week was similar in 2012/13 and in 2015/16 (47% and 48% respectively). The proportion taking three or more medicines was also similar between the two time points (23% and 24% respectively).

Figure 10, Table 13

Figure 10: Number of prescribed medicines used in the last week in 2012-13 and in 2015-16, by sex

Base: Aged 16 and over with a nurse visit

Source: NHS Digital

Other findings were also similar between the two time points; for example, medicine use showed a similar pattern of increase with age. At both time points, prescribed medicine use was higher in more deprived areas and the proportion of adults taking three or more prescribed medicines was lowest in London and the South East.

Discussion

Comparison with Prescription Cost Analysis

The data collected by the Health Survey for England can be used to examine patterns of prescribed medicine use by a large variety of demographic, socio-economic, and health status factors. Table C shows the most commonly prescribed items in primary care in England in 2013 and 2016, according to Prescription Cost Analysis.[33,34]

The Prescription Cost Analysis report is organised according to the BNF (edition 68) hierarchy of chapters, and each line in Table C is mutually exclusive. Participants in the Health Survey for England reported their use of medicines, pills, syrups, ointments, puffers, of injections; these correspond to the BNF edition 68 chapters 1 to 15. The categories used in this report to describe Health Survey for England data are also based on the BNF, but on particular sections grouped together for clinical reasons. Therefore, the categorisations are not directly comparable. For example, the HSE categorisations of 'anxiolytic and hypnotic medicines', 'antipsychotic medicines', and 'antidepressant medicines', based on BNF sections 4.1, 4.2 and 4.3 respectively, are subsets of the BNF chapter 4, 'central nervous system', which also includes some types of painkillers ('analgesics'). Despite the differences in categorisation, and in counting medicine users in HSE vs numbers of items prescribed, it is useful to look at the two sources together, in particular for trends over time.

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[33] Prescription Cost Analysis England - 2013: Tables, NHS Digital 2014.
https://digital.nhs.uk/catalogue/PUB13887

[34] Prescription Cost Analysis England - 2016: Data Tables, NHS Digital 2017.
https://digital.nhs.uk/catalogue/PUB23631

Table C: Prescription Cost Analysis totals, by BNF edition 68 chapters[35]

BNF chapter	Items prescribed 2013 (millions)	Items prescribed 2016 (millions)
2 Cardiovascular system	307.4	319.7
4 Central nervous system	187.5	206.8
6 Endocrine system	95.9	106.8
1 Gastro-intestinal system	87.6	98.0
3 Respiratory system	66.0	72.2
9 Nutrition & blood	51.7	59.0
5 Infections	48.7	45.3
13 Skin	41.7	38.0
10 Musculoskeletal & joint diseases	32.5	33.5
7 Obstetrics, gynaecology, & urinary-tract disorders	25.1	29.3
11 Eye	20.4	20.1
14 Immunological products & vaccines	14.2	13.6
12 Ear, nose & oropharynx	11.9	12.4
8 Malignant disease & immunosuppression	4.2	4.4
15 Anaesthesia	1.5	1.7
Total BNF chapters 1-15	996.2	1,060.9
Other prescribed items	33.9	43.2
Total prescribed items	1,030.1	1,104.1

Between 2013 and 2016, the number of items prescribed for central nervous system conditions (including mental health conditions, brain conditions, and pain) increased by 19.3 million, a 10% increase. For cardiovascular diseases (including medicines prescribed to reduce the risk of developing cardiovascular disease), there was an increase of 12.3 million (a 4% increase). Other large increases were 10.8 million (11% increase) for medicines prescribed for endocrine system diseases (of which diabetes medicines increased by 6.9 million, that is, a 16% increase), and 10.4 million (12% increase) for gastro-intestinal medicines. Cost per item varied by category of medicine, nonetheless, the most expensive categories were central nervous system (£1.8 billion), endocrine (£1.4 billion), respiratory (£1.1 billion) and cardiovascular (£1.1 billion).

Altogether, 1,061 million medicines from BNF codes 1-15 were prescribed in 2016, at a total cost at list price[36] of £8.3 billion, compared with 996 million items and £7.8

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[35] This table includes prescribed medicines coded within the BNF edition 68. Medicines asked about in the Health Survey for England correspond to BNF chapters 1 to 15. Other items available on prescription, such as dressings and appliances, are not asked about in the Health Survey for England, but are included in the final two lines of the table above and in other data on NHS items prescribed or cost of items prescribed.

billion in 2013. Including other items, such as dressings and appliances, 1,104 million items were prescribed in 2016 (£9.2 billion), compared with 1,030 million items in 2013 (£8.6 billion).

Use of specific classes of medicines, comparisons with QOF

The Quality and Outcomes Framework (QOF) includes prevalence rates for a range of common long term conditions, calculated from general practice registers of people with a recorded diagnosis of those conditions.[37] Some of the medicine categories used in the HSE can be compared against QOF prevalence rates for particular conditions.

In 2015/16, of the categories examined in this report, antihypertensives were most commonly used, at 15% of adults. This corresponds closely to the QOF reported prevalence of 13.8% (all ages) for 2015/16. Antidepressants were used by 10% of adults 16 and over, these are used for depression, and for other reasons such as neuropathic pain. QOF figures show 8.3% of adults 18 and over have a recorded diagnosis of depression. Medicines for asthma and chronic obstructive pulmonary disease (COPD) were taken by 7% of adults, compared with QOF prevalence figures among adults and children of 5.9% (asthma) and 1.9% (COPD). Antidiabetic medicines were taken by 5% of adults aged 16 and over in HSE 2015/16, while the prevalence of diagnosed diabetes was 6.5% of those aged 17 and over.

Medicine use by health status

Having one or more longstanding conditions was predictive of prescribed medicine use, particularly limiting longstanding illness. Similarly in 2012/13 and 2015/16, among those aged 65 and over, those who needed assistance for activities of daily living were more likely to have prescribed medicines than those who did not.

The 2012/13 report detailed the association of greater prescription medicine use by those with a higher BMI. This report found a similar relationship with waist circumference.

This report compares for the first time the prescription medicine use of participants by renal function and of those with and without mental ill health. Moderately or severely decreased kidney function, $eGFR_{creat}$ of less than 60ml/min/1.73m^2, was associated with higher prevalence of prescribed medicine use, in particular anti-hypertensives and renin-angiotensin-aldosterone system antagonists. HSE data cannot distinguish the time course, and whether survey participants with poor renal function were prescribed these medicines because of chronic kidney disease or because of having other indications for these medicines, which may have predated the kidney disease. NICE guidance on pharmacotherapy for kidney disease depends on comorbidity of other conditions (such as hypertension, or diabetes) as well as the severity of the

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[36] Note that cost at list price is the basic cost of a drug excluding VAT and is not necessarily the price the NHS paid. It does not take account of any contract prices or discounts, dispensing costs, fees or prescription charges income, so the amount the NHS paid will be different.

[37] NHS Digital *Quality and Outcomes Framework Prevalence, Achievements and Exceptions Report England 2015-16.* https://digital.nhs.uk/catalogue/PUB22266

This report covers HSE data from 2015 and 2016, and is therefore compared with the 2015-16 QOF report above. A more recent report covering the QOF data for 2016-17 is available here: http://digital.nhs.uk/catalogue/PUB30124

condition.[38] Future analyses of the HSE data could examine this in more detail, to ascertain the extent to which different groups of individuals were taking prescribed medicines in accordance with the guidance.

Higher GHQ-12 score was associated with greater antidepressant use (taken by 22% of those with a GHQ-12 score of 4 or more, compared to 6% of those with a GHQ-12 score of 0) and mental health medicine use (taken by 24% of those with a GHQ-12 score of 4 or more, compared to 6% of those with a GHQ-12 score of 0). Those with a higher GHQ-12 score had higher overall medicines use, and this was not driven only by medicines specifically for mental health problems: those with a GHQ-12 score of 4 or more were also more likely to take non-mental health medicines than those with a score of 0 (59% compared to 41%). It is not possible to infer from this whether participants' physical and mental health medicine needs had a common cause, or physical health conditions (indicated by medicine use) worsened mental health, or if poor mental health had had a physical effect.

Recent guidance on prescribing

Additional guidance affecting prescribing has been published since data collection started for HSE 2016, and after HSE 2015 data collection had ended. NICE published thirty one guidelines in the financial year 2016/17. In 2016/17, 53 technology appraisals were published, the majority being on medicines and with a positive recommendation for use in the NHS.[39]

In September 2016, NICE published a guideline on *Multimorbidity: clinical assessment and management*.[40] Multimorbidity is usually defined as having two or more long-term health conditions. It becomes more common as people age, and is more common in people from less affluent areas. In older people multimorbidity is largely due to higher rates of physical health conditions, whereas in younger people and people from less affluent areas, multimorbidity is often due to a combination of physical and mental health conditions (notably depression). The guideline aims to optimise care for adults with multimorbidity by reducing the treatment burden (polypharmacy and multiple appointments) and unplanned care. It aims to improve quality of life by promoting shared decisions based on what is important to each person in terms of their treatments, health priorities, lifestyle and goals.

Multimorbidity matters because it is associated with reduced quality of life, higher mortality, polypharmacy and high treatment burden for individuals and much greater use of health and care services. Treatment regimens can easily become very burdensome for people with multimorbidity, and care can become uncoordinated and fragmented. Polypharmacy (use of 10 or more medicines) in people with multimorbidity is often driven by the introduction of multiple medicines intended to prevent future morbidity and mortality.

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[38] National Institute for Health and Clinical Excellence. *Chronic kidney disease in adults: assessment and management. Clinical guideline CG182.* London, NICE, 2015. www.nice.org.uk/guidance/cg182

[39] National Institute for Health and Clinical Excellence. *NICE annual report and accounts: 2016 to 2017.* London, NICE, 2017. https://www.gov.uk/government/publications/nice-annual-report-and-accounts-2016-to-2017

[40] National Institute for Health and Clinical Excellence. *Multimorbidity: clinical assessment and management. NICE Guideline NG 56.* London, NICE, 2016. https://www.nice.org.uk/guidance/ng56

In HSE 2015/16, use of 10 or more prescribed medicines in the past week was relatively uncommon overall (2.7% of the population). However, among older adults, the proportions who had used 10 or more prescribed medicines in the last week increased from 6% of those aged 65 to 74 to 13% of those aged 85 and over (Table D).

Table D: Use of 10 or more medicines (polypharmacy) by age and sex

	Age					
	16-54	**55-64**	**65-74**	**75-84**	**85+**	**Total**
	%	%	%	%	%	%
Men	1	5	6	8	16	3
Women	1	4	6	9	11	3
All adults	1	4	6	9	13	3

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