NHS
Business Services Authority

Statistics at NHSBSA

Medicines Used in Mental Health (MUMH) – England

Background information and methodology

December 2020

Document release note

Document name: Medicines Used in Mental Health – Background Information and Methodology

Document details name	Version number	Description
Medicines Used in Mental Health – Background Information and Methodology	v002	Document providing background information and details on methodologies used for the annual Medicines Used in Mental Health Official Statistic publication.

Revision details revision number	Revision date	Revision description	Page number	Previous page number	Action taken	Addenda / new page
V002	March 2021	COVID-19 impact calculations	Page 8	N/A	Added information on methodology of COVID-19 impact calculations	Page 8

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About this document

This document is intended to provide detailed information about prescription data, including the processes carried out to transform a prescription issued by a prescriber and submitted for reimbursement by dispensing contractor, into these statistics. This document also provides information on the methodologies used in these statistics and used in an operational context to ensure the accuracy and trustworthiness of these data.

This document will be updated as the statistical methodologies and underlying business processes change over time; it will remain relevant to the most up to date releases of the series.

About these statistics

The Medicines Used in Mental Health annual publication and quarterly summary statistics show the volumes of prescription items and unique patients for a subset of drugs that have been classified as being used primarily for the treatment of mental health disorders and illnesses. These drugs are described by the British National Formulary (BNF) sections:

- BNF section 4.1 – Hypnotics and anxiolytics
- BNF section 4.2 – Drugs used for psychoses and related disorders
- BNF section 4.3 – Antidepressant drugs
- BNF section 4.4 – CNS stimulants and drugs used for ADHD
- BNF section 4.11 – Drugs for dementia

These sections are held in the same structure of the BNF prior to the release of version 70.

The annual statistics also include breakdowns of prescribing by age band, sex, and the Index of Multiple Deprivation (IMD). These breakdowns are not included in the quarterly statistics at this time.

This publication can have a wide range of uses including informing government or local NHS policy, and allowing public scrutiny of national and regional prescribing habits.

1. Background information

The prescription journey

A prescription goes through a number of stages before the data extracted from it ends up in our administrative data warehouse and subsequently in this publication.

The prescription starts its journey when it is issued by a GP, nurse or other authorised prescriber. The prescription can be issued in paper form or as an electronic prescription using the Electronic Prescription Service (EPS). At the time of publishing, EPS prescription items account for approximately 85% of all prescription items. This prescription is then taken, or in the case of EPS sent, to a dispensing contractor to be dispensed. The contractor submits their prescriptions at the end of the month to the NHS Business Services Authority (NHSBSA) to calculate how much money they should be reimbursed for the dispensed prescriptions. EPS prescriptions are transmitted as electronic messages using the NHS Spine maintained by NHS Digital, and from there it is sent to the NHSBSA for processing.

Once received by the NHSBSA paper prescriptions are scanned and transformed into digital images, which are then passed through Intelligent Character Recognition (ICR) to extract data from the paper form. The majority of paper forms go through ICR without any manual intervention. However, there are cases where a prescription form is reviewed by a human operator to accurately capture the relevant information from the prescription form. This manual intervention can be required for many reasons, such as if a form is handwritten or information is obscured by a pharmacy stamp.

All data from both paper and electronic prescriptions is processed by the NHSBSA's Capacity Improvement Program (CIP) database. This is the main transactional database that is used for calculating the reimbursement of dispensing contractors. Data is then passed to the Dedicated Payment of Contractors (DPC) database to calculate the final payments that are to be made to dispensing contractors.

Prescription data is extracted from CIP and loaded into the NHSBSA Data & Insight Data Warehouse from where it can be analysed and processed into management information, administrative data feeds, and be used for the production of Official Statistics.

Personal Demographic Service data

The Personal Demographic Service (PDS) is a part of NHS Digital that holds information that allows healthcare professionals to identify patients and match them to their health records. This includes information such as NHS number, date of birth, gender, registered address and registered GP practice.

Each month when data is loaded into the NHSBSA Data & Insight Data Warehouse, NHS numbers that have been captured are sent to PDS to verify them. That list includes all NHS numbers that were scanned in that month and previously verified NHS numbers that have a birthday in that month. Details held by PDS are returned to the NHSBSA, including updates to previously verified NHS numbers.

As this process takes time new and updated verified data from PDS is loaded into the NHSBSA Data & Insight Data Warehouse the month after the NHS numbers were first scanned. For example, a new NHS number received in January and subsequently verified would be classed

as ‘not verified’ in January and ‘verified’ in February. In February the additional information about that patient such as gender and age would become available.

2. Methodology

Patient age

In order to report a patient's age consistently across a financial year these statistics classify a patient based on their age at the 30th September of the given financial year. This uses information from PDS for verified NHS numbers only. Information relating to NHS numbers that have not been verified by PDS are displayed in these statistics under the 'unknown/indeterminate' age band.

There are some inconsistencies within the PDS data that is held within the NHSBSA Data & Insight Data Warehouse. These occur when a patient has had their information updated and can hold more than one date of birth. In these instances multiple counting can occur for patients, although this is estimated to only affect a very small number of patients. We will investigate methodologies to reduce the impact of these inconsistencies.

Patient gender/sex

The NHSBSA does not capture information relating to a patient's sex or gender from a prescription during processing activities. Gender is instead obtained from the PDS. Therefore, gender information is only available for patients that we have been able obtain a matched NHS number for. It should be noted that this definition does not conform to the latest national standards for data reporting. Therefore we use the terms gender and the classifications of male and female as stored in our historic data.

In these statistics this gender information has been more accurately referred to as patient sex in the statistical summaries and statistical summary tables.

A patient is classified in one of four ways for gender by PDS:

0 – Unknown
1 – Male
2 – Female
9 – Indeterminate (unable to be classified as either male or female)

The NHSBSA also codifies gender for patients where we have been unable to match their NHS number to PDS as 'Unknown'.

In these statistics patients that hold a gender of 0 – unknown and 9 – indeterminate have been grouped together into a single category.

A patient's gender may change over time due to a number of reasons. Therefore, in these statistics it is possible for a patient to be recorded against multiple genders.

Patient deprivation

The English Indices of Deprivation 2019[1] have been used in these statistics as a measure of the level of deprivation of the areas in which prescriptions have been issued. In particular, that headline Index of Multiple Deprivation (IMD) is included. IMD data has been joined to the National Statistics Postcode lookup (NSPL) UK May 2020 release using lower super output area (LSOA) 2011. This combined dataset has then been joined to prescription data using the

[1] https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

postcode of the prescribing organisation that issued the item. The LSOAs are analysed in groups, or 'deciles' each representing 10% of the areas from the deprivation scores, to the lowest. The measure of deprivation reported in these statistics is the IMD decile of the area in which the prescribing organisation is located.

Where a practice or other prescribing organisation has closed, the latest postcode held on record for that organisation has been used to assign an IMD decile.

Where a prescribing organisation's postcode has not been able to be matched to NSPL or the prescriber has not been identified, the records are reported as 'unknown' IMD decile.

Changes to BNF classifications

These statistics use the BNF therapeutic classifications defined in the British National Formulary (BNF) using the classification system prior to BNF edition 70. Each January the NHSBSA updates the classification of drugs within the BNF hierarchy which may involve some drugs changing classification between years of MUMH data. The NHSBSA publishes the latest BNF information each year via its information systems. This is currently done via the Information Services Portal (ISP) but may in the near future be transitioned to the NHSBSA Open Data Portal (ODP).

Item trends during COVID-19

The number of items prescribed for each BNF section in 2020 was compared to the number of items that would be expected to be prescribed based on 2019 trends. Data for the 12 months January to December 2019 was used to create a linear regression forecast for January to December 2020, with the annual totals compared. By using a linear regression, this predicts a future value based on a line of best fit of previous values. Due to the way this is calculated, seasonality was therefore averaged across the data set and so figures stated are for 2020 rather than for the 10 months of March to December 2020 considered elsewhere as the 'COVID-19 period'. This model isn't affected by the increase in Electronic Prescription Service (EPS) usage, but may be impacted by factors other than COVID-19, such as:

- Changes in patient behaviour, demographics or morbidity
- External environmental factors that could drive prescribing
- Any (and all) policy initiatives and guidance
- Other local priorities and resources

Identified patient trends during COVID-19

The number of patients receiving medicines used in mental health in 2020 was compared to the number of patients that would be expected to receive these medications based on 2019 trends. Data for the 12 months January to December 2019 was used to extrapolate figures for January to December 2020 using the line of best fit, with the annual totals compared. As with items, this averaged seasonality across the entire data set by using a linear regression analysis and so states figures for 2020 for the whole year based on a line of best fit on previous values.

Unlike with item numbers, these figures would be impacted by the increase in use of the Electronic Prescription Service (EPS) noted over 2020. As a greater number of prescriptions are recorded digitally rather than through paper scanning, the patient identification rates have increased against 2019 figures. This means where patient numbers have increased, this could

partly be due to greater patient identification rather than an actual increase in patients. Where patient numbers are declining, the increased patient identification has been factored in to give comparable figures to the patient increases. Patient figures are stated as “up to”, for example “This resulted in up to an additional 10,200 more identified patients per month than expected based on 2019 trends.” to emphasise that this is the maximum increase or decrease in patient numbers, but these figures *may* be impacted by other factors as listed above and are *likely* to be impacted by increased patient identification, rather than any changes being exclusively due to COVID-19.

3. Strengths and Limitations

Strengths

The main strength of these statistics is the completeness of the dataset and accuracy of information captured during processing activities carried out by the NHSBSA. This dataset covers all prescribing that has been dispensed in the community in England, with consistency in the way data has been captured and applied across the whole dataset. All of the data has come from the same administrative source. This administrative data is required to be as accurate as possible as it is used to pay dispensing contractors for services provided to NHS patients.

Limitations

These statistics exclude prescriptions that were issued but were not presented for dispensing and prescriptions that were not submitted to the NHSBSA for processing and reimbursement. Prescriptions issued and dispensed in prisons, hospitals and private prescriptions are also excluded.

Additional patient information received from PDS for matched NHS numbers is not returned until after the monthly ETL process for prescription data into the NHSBSA Data & Insight Data Warehouse is complete, and so the year in progress monthly or quarterly patient counts may include some unverified data and subsequently be revised in a later publication.

These statistics do not include patient demographic details. While this is available in the annual publication, this is currently not in scope for the quarterly publication. We are looking to add this in future releases.

4. Revisions

Any revisions that we make to these statistics will be made in line with our Revisions and Corrections Policy. Any significant errors that are identified within these statistics after their publication that would result in the contradiction of conclusions previously drawn from the data will be: displayed prominently on our website and any other platforms that we use to host these statistics, corrected as soon as possible, and communicated clearly to users and stakeholders.

5. Quality of the statistics

We aim to provide users of this publication with an evidence based assessment of its quality and of the quality of the data from which it is produced. We do so to demonstrate our commitment to comply with the UK Statistics Authority's Code of Practice for Statistics, particularly the pillar of Quality, and its principles that:

Q1 Suitable data sources – Statistics should be based on the most appropriate data to meet intended uses. The impact of any data limitations for use should be assessed, minimised and explained

Q2 Sound methods – Producers of statistics and data should use the best available methods and recognised standards, and be open about their decisions.

Q3 Assured quality – Producers of statistics and data should explain clearly how they assure themselves that statistics and data are accurate, reliable, coherent and timely.

Details of how we define statistical quality can be found in our Statement on Statistical Quality: Guidelines for Official and National Statistics. This is an assessment of the quality of these statistics against the European standard for quality reporting and its dimensions specific to statistical outputs, particularly:

- Relevance
- Accuracy and reliability
- Timeliness and punctuality
- Accessibility
- Coherence and comparability

These principles guide us, and are complimented by the UK Statistics Authority's Regulatory Standard for the quality assurance of administrative data.

Relevance

This dimension covers the degree to which the product meets user need in both coverage and content

The MUMH publication, released annually, as well as a quarterly summary statistic, summarises the number of items prescribed for drugs related to mental health. The statistics also give patient breakdowns including by 5 year age band, gender, and IMD decile. These statistics cover from financial year 2015/16 onwards, allowing the analysis of long term trends in prescribing. These publications are the first in a new series released by the NHSBSA. We believe that they can be used to inform policy decisions at a national and local level, by the public to scrutinise prescribing habits, and by academia and applied health researchers for matters relating to public health. The NHSBSA also routinely receives Freedom of Information requests and parliamentary questions about this subject matter.

We will be gathering feedback from users of these statistics on an on-going basis to help shape them and ensure that they remain relevant and of use.

Accuracy and reliability

This dimension covers the statistics proximity between an estimate and the unknown true value

Accuracy

These statistics are derived from data collected during processing activities carried out by the NHSBSA to reimburse dispensing contractors for providing services to NHS patients. Prescriptions are scanned and subject to rigorous automatic and manual validation processes to ensure accurate payments are made to dispensing contractors. Where electronic prescriptions are used the scope for manual intervention and input into data is reduced.

The figures used are collected as an essential part of the process of reimbursing dispensing contractors (mainly pharmacists and dispensing doctors) for medicines supplied. All prescriptions which are dispensed in England need to be submitted to NHS Prescription Services within the NHSBSA if the dispenser is to be reimbursed, and so coverage should be complete. NHS Prescriptions Services internally quality assures the data that is captured from

prescriptions to a 99.60% level via a statistically valid random sample of 50,000 items that are reprocessed on a monthly basis. The latest reported Prescription Processing Information Accuracy from NHS Prescriptions services, which covers the 12 month period August 2019 to July 2020 is 99.81%. Due to the manual processes involved in the processing of prescriptions there may be inaccuracies in capturing prescription information which are then reflected in the data.

Reliability
As there is a manual data entry element to this system then inevitably some small errors may occur in the data. The NHSBSA and NHS Prescription Services take measures to minimise these errors. This includes the presence of a permanent dedicated accuracy team within NHS Prescription services which provides feedback to operators around any errors identified to help prevent regular occurrence.

Timeliness and punctuality

Timeliness refers to the time gap between publication and the reference period. Punctuality refers to the gap between planned and actual publication dates

The MUMH publication is published annually, along with a set of quarterly summary statistics. The publication date is determined by the availability of the data, dependent on the completion of processing by NHS Prescription Services while allowing adequate time for the compilation, and quality assurance, of the publication. The data is usually available six weeks after the end of the month that the data relates to. We aim to release the annual publication, along with the quarterly updates, as close to availability of data as possible for the time period in question. The date of release for the annual publication and quarterly updates will be announced in advance in line with our statistical release calendar.

Accessibility and clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice

Accessibility
This publication is presented in an HTML file, with supporting documentation released in PDF format.

Summary data and additional analysis is presented in tables in Excel.

The R code used to produce the publication will also be made available from the NHSBSA GitLab in due course.

Clarity
A glossary of terms is included in this document.

Coherence and comparability

Coherence is the degree to which data which have been derived from different sources or methods but refer to the same topic or similar. Comparability is the degree to which data can be compared over time and domain

Comparability and coherence

The MUMH publications are the only statistics available on the prescribing of mental health related drugs that have been dispensed in the community. The statistics are all derived from the same administrative data source with the same methodology applied to all data points.

The figures released in these statistics relating to item counts and total costs can be recreated from the English Prescribing Dataset (EPD) administrative data feed, available from the NHSBSA Open Data Portal (ODP). NHSBSA Information Services provide this data feed, and this feed is not an official statistic.

This publication closely mirrors the content of the Medicines Used in Mental Health publication release by Information Services Division (ISD) for NHS Scotland. We intend to include further measures, including measures of Defined Daily Doses (DDDs) to bring this publication more in line with the Scottish publication, allowing better comparisons to be made between England and Scotland. DDDs also allow for international comparisons.

Comparability with other publications produced by the NHSBSA can be determined using the Official Statistics guidance table (pdf), which is maintained with the release of each new publication. This table shows how all of NHSBSA's publications compare across a range of measures to help users identify the best publication for their needs or understand where differences in figures may occur.

Comparisons over time

In order to allow for comparisons to be made over time these statistics cover the whole period for which data is available, from financial year 2015/16 onwards.

Changes to the figures over time should be interpreted in the wider context of the prescribing system as a whole, including in the availability of medicines, release of new medicines, their costs and changing prescribing guidelines. All medicines are shown by their latest BNF classification, as described in section 2 – methodology.

Trade-offs between output quality components

This dimension describes the extent to which different aspects of quality are balanced against each other

The main trade-off in this publication is the balance between timeliness and data quality. Sufficient time is allowed from the data being made available to allow for the information to be produced and quality assured.

We are releasing these experimental Official Statistics to allow users to begin analysing them, however we intend to introduce further data cleansing in the future that will improve the quality and accuracy of these statistics. This will be introduced once the data cleansing can be done in a timely manner and will not impact the release of the publication. The impact is expected to be a small amount of reclassification that will not impact most of the main conclusions or user's analysis.

Assessment of user needs and perceptions

This dimension covers the processes for finding out about users and uses and their views on the statistical products

Alongside the release of these statistics the NHSBSA will also be releasing a continuous feedback survey, allowing users to quickly tell us their thoughts on the content and utility of these statistics. This feedback, along with feedback gathered from other routes such as direct contact, will be used to shape the content and style of future MUMH publications and other statistical products from the NHSBSA. This publication also has a detailed user engagement plan specific to MUMH.

Performance, cost and respondent burden

This dimension describes the effectiveness, efficiency and economy of the statistical output

There is no respondent burden for MUMH data, as all data are extracted from existing NHSBSA information and transactional systems.

This initial release has been developed with a reproducible analytical pipeline (RAP) in mind and RAP principles applied where possible. This development has been done in R and the code used will be made publicly available at the NHSBSA GitLab. Further development is planned to the RAP used for this publication to automate as many tasks as possible.

Confidentiality, transparency and security

The procedures and policy used to ensure sound confidentiality, security and transparent practices

Trustworthy statistics and the data behind them are an important part of well informed decision making, and are vital to support improvement across the wider health and social care system. It is accepted, however, that where statistics provide information on small numbers of individuals, the NHS Business Services Authority have a duty under data protection law to avoid directly or indirectly revealing any personal details. In addition, NHSBSA staff members are required to adhere to relevant NHS data confidentiality guidelines.

The NHSBSA has robust confidentiality and security policies that were adhered to during the production of these statistics. More information on these policies and how we follow them can be found in our Confidentiality and Access Statement.

A risk assessment around potential disclosure of personal identifiable information through these statistics was carried out during their production. In line with the NHSBSA's Statistical Disclosure Control Policy, patient counts less than five, or item and cost information where a patient count of less than five can be inferred, has been redacted with "*". Patient counts have also been omitted from geographical breakdowns below national level due to the level of redaction that would be applied.

Quality assurance of administrative data

In addition to the assessment we have followed the Quality Assurance of Administrative Data (QAAD) toolkit, as described by the Office for Statistics Regulation (OSR). Using the toolkit we established the level of assurance we are seeking (or "benchmark") for each source. The

assurance levels are set as basic, enhanced, or comprehensive depending on the risk of quality concerns for that source, based on various factors.

We have made a judgement about the suitability of the administrative data for use in producing this publication, this is designed to be pragmatic and proportionate. The QAAD assessment for prescription data can be found on the NHSBSA website.

6. Related statistics, comparability and useful resources

The NHSBSA releases the Official Statistics publication on MUMH in England. A similar release is produced by the devolved administration for Scotland. However, there are a number of differences between the countries in the way that data is captured and classified. Therefore caution should be taken when drawing comparisons between the separate datasets.

Each devolved authority within the UK makes its own decisions on presentations that are allowable on a prescription; however all use a common formulary, the British National Formulary, which is used to classify drugs based on primary therapeutic use.

NHS Digital mental health hub

The mental health data hub is a collection of interactive dashboards and useful links covering mental health data in England.

Office for National Statistics (ONS) mental health statistics

ONS publishes several statistical publications relating to mental health.

Code of Practice for Statistics

These statistics have been produced in compliance with the Code of Practice for Statistics. You can find more on the code of practice and its pillars, principles and practices from the UK Statistics Authority website.

NHSBSA Open Data Portal

The NHSBSA Open Data Portal is the platform where we host our open data products, including the presentation level data tables released as part of these statistics.

7. Glossary of terms used in these statistics

Age

A patient's age, and therefore 5 year age band, has been calculated at 30 September for the given financial year. This age has been calculated using the patient date of birth shared with the NHSBSA from PDS.

British National Formulary (BNF)

MUMH data uses the therapeutic classifications defined in the British National Formulary (BNF) using the classification system prior to edition 70. NHS Prescription Services have created pseudo BNF chapters for items not included in BNF chapters 1 to 15. The majority of such items are dressings and appliances, which have been classified into six pseudo BNF chapters (18 to 23).

Information on why a drug is prescribed is not available in this dataset. Since drugs can be prescribed to treat more than one condition, it may not be possible to separate the different conditions for which a drug may have been prescribed.

The BNF has multiple levels, in descending order from largest grouping to smallest: chapter, section, paragraph, sub-paragraph, chemical substance, product, presentation. Presentations in chapters 20-23 do not have an assigned BNF paragraph, sub-paragraph, chemical substance or product.

Chemical substance

A chemical substance is the name of the main active ingredient in a drug. It is determined by the British National Formulary (BNF) for drugs, or the NHSBSA for appliances. An example is Amoxicillin. Appliances do not hold a true chemical substance.

Cost

The amount that would be paid using the basic price of the prescribed drug or appliance and the quantity prescribed, sometimes called 'Net Ingredient Cost' (NIC). The basic price is given either in the Drug Tariff or is determined from prices published by manufacturers, wholesalers or suppliers. The basic price is set out in Parts VIII and IX of the Drug Tariff. For any drugs or appliances not in Part VIII, the price is usually taken from the manufacturer, wholesaler, supplier of the product or the price endorsed by the dispenser.

Dispensed in the community

When a prescription item is dispensed in the community this means that it has been dispensed by a community pharmacy or other dispensing contractor. This does not include medicines dispensed within hospitals and prisons.

Dispensing contractor / dispenser

A dispensing contractor or dispenser can be a community pharmacy or appliance contractor (a dispenser that specialises in dispensing dressing, appliances and medical devices). Prescriptions can also be dispensed by the dispensary of a dispensing practice or personally administered at a practice. Dispensing practices usually exist in more rural areas where the need for a dispenser is deemed necessary but it is not deemed financially viable to establish a community pharmacy.

Gender / sex

Information relating to a patient's gender is not captured by the NHSBSA. This is instead derived by PDS data that is shared with the NHSBSA for NHS numbers that have been matched. This term is not consistent with national data standards. For more information on this please see section 2 – methodology.

Identified patients

An identified patient is where an NHS number captured by the NHSBSA during prescription processing activities has been successfully matched to an NHS number held by the Personal Demographic Service (PDS), and PDS data, such as date of birth and gender, returned to the NHSBSA.

Items

The term Items refers to the number of times a product appears on a prescription form. Prescription forms include both paper prescriptions and electronic messages.

Prescription form

A prescription form has two incarnations, a paper form, and an electronic prescription available via EPS. A paper prescription can hold up to a maximum of ten items. A single electronic prescription can hold a maximum of four items.

Presentation

A presentation is the name given to the specific type, strength, and pharmaceutical formulation of a drug or the specific type of an appliance. For example, *Paracetamol 500mg tablets*.

Feedback

Feedback is important to us.

We welcome all comments about this document and its contents. Please quote 'MUMH – Background and Methodology Note' in the subject title of any correspondence.

A continuous feedback survey is available on the Medicines Used in Mental Health web page that can be completed by users.

Contact us

You can contact us by:

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