**Antimicrobial Stewardship**

**Dashboard – Children**

**Version: September 2021**

**Comparator Descriptions and Specifications**

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# Background

Antimicrobial resistance (AMR) is a global problem that impacts all countries and all people, regardless of their wealth or status. The scale of the AMR threat, and the need to contain and control it, is widely acknowledged by country governments, international agencies, researchers and private companies alike. The Department of Health and Social Care sets out a 5-year national action plan and a 20-year vision to tackle AMR. The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources), focuses on three key ways of tackling AMR:

* reducing need for, and unintentional exposure to, antimicrobials;
* optimising use of antimicrobials; and
* investing in innovation, supply and access.

This UK national action plan includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community. Following inclusion of AMR within the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and [NHS Patient Safety Strategy](https://www.england.nhs.uk/patient-safety/the-nhs-patient-safety-strategy/) the NHS AMR Programme has been established to support implementation within the NHS. Primary care antibiotic prescribing accounts for [72% of all antibiotic prescribing in England](https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report) and primary care prescribing has been reducing each year since 2015. The NHSBSA capture and report dispensed NHS prescription data with patient identifiers, and this has enabled improved reporting of activity by age in the ePACT2 system. In FY 2019-20 around 30 million antibiotic prescription items were dispensed. Children aged 0-14 years accounted for 3.6 million (12%) of these items, of which 48% was prescribed to children aged 0-4 years. Amoxicillin is the most commonly prescribed antibiotic to children, and accounts for 53% of all antibiotic use in 0-4-year-olds. There is significant seasonal variability associated with antibiotic prescribing in children with greatest antibiotic prescribing for respiratory infections during the winter months. There is unexplained variation in primary care antibiotic prescribing for children between and within NHS systems.

[NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics, advice for self-care, and include information for the public. Public Health England publish [TARGET](https://www.rcgp.org.uk/clinical-and-research/resources/toolkits/amr/target-antibiotics-toolkit.aspx) resources to support antimicrobial stewardship in primary care and these include patient information leaflets. [‘When should I worry?’](http://www.whenshouldiworry.com/) is a booklet that provides information for parents about the management of respiratory tract infections (coughs, colds, sore throats, and earaches) in children, and has been designed to be used in primary care consultations. The [Caring for children with coughs](https://child-cough.bristol.ac.uk/) website was created by a collaboration of researchers and parents and provides information for parent when their child had a cough. Public Health England publish [e-Bug](https://www.e-bug.eu/index.php?name=UK-global-teacher-homepage) resources that are free educational resources for schools about micro-organisms, the spread, prevention and treatment of infection. Paediatric antimicrobial stewardship resources are also hosted by the [British Society for Antimicrobial Chemotherapy](https://bsac.org.uk/paediatrics/) (BSAC).

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# Purpose

The purpose of the Antimicrobial Stewardship dashboard - Children is to allow NHS organisations to

* see the variation in antibiotic prescribing for children aged 0-14 years
* compare antibiotic prescribing rates over time and between organisations
* understand how many children are prescribed one or more antibiotics
* identify and prioritise opportunities for antimicrobial stewardship improvement
* monitor and report antimicrobial stewardship improvement

# Limitations

Historically, primary care prescribing information was derived from the reimbursement processes for dispensed medicines. However, the NHSBSA is now able to capture extra information that undoubtedly adds value to prescribing measures. The NHS number of the recipient of a medicine prescribed in primary care can now be linked to items prescribed. This development enables the data to show how many patients are prescribed a medicine or group of medicines (rather than presentation of drugs prescribed by each GP practice). In this way, we are able to demonstrate much better the quality of prescribing in key areas.

Information governance is very important and in the preparation of these comparators, all data protection legislation and patient confidentiality has been carefully considered and adhered to. While comparators may be derived from patient level records, personal identifiable data will not be included within the reports.

Each comparator has a full specification outlining the evidence base behind the comparator; the rationale for inclusion and the data source (see Table 1 for list of comparators).

**This comparator specification document is NOT a prescribing guideline. It simply shows how the comparators were developed and the rationale behind each comparator.**

# Table 1: List of comparators

|  |
| --- |
| **Comparator Title** |
| ASC01 – Prescribing of antibacterial items per 1,000 children |
| ASC02 – Number of children prescribed antibiotics per 1,000 children |
| ASC03 – Number of children prescribed multiple antibiotics |
| ASC04 – Prescribing of specific antibiotics per 1,000 children |
| ASC05 – Prescribing of UTI related antibiotic items per 1,000 children |

# Prescribing data used in these comparators

Users of these prescribing comparators must be aware of the following parameters:

The data for these comparators

* Covers all items prescribed in primary care by practices and cost centres linked to CCGs.
* Is only displayed for current CCGs, and not closed CCGs
* Does not include medicines supplied over the counter.
* Does not include medicines supplied by NHS community services.

Each comparator is presented as either a single month’s prescribing, or using prescribing data for a 12-month period, rolled into a single month, where each data point represents a year’s worth of prescribing. Historic data is available to allow organisations such as practices, PCNs or CCGs to chart their progress in addressing a particular comparator area.

Each comparator is presented in four different patient age bands:

0-4 years old

5-9 years old

10-14 years old

0-9 years old

All the comparators show data at GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level).

For patient list sizes used in these comparators, the 12-month-rolling figure is calculated as the mean average of the monthly figures within the 12 months. For example the list size for the 12-month period January 2020 to December 2020 is the sum of the list size for each month January 2020 to December 2020, divided by 12. Note that list sizes by age band were not available before therefore list size for the 12-months-rolling to December 2018 will be the mean average of the list sizes from November and December 2018, and the list size for the 12-months-rolling to January 2019 will be the mean average of the list sizes from November 2018, December 2018 and January 2019, and so on.

Due to list sizes by age band not being available before November 2018, the comparator data is not available before this date.

**Unique patient:** This has been determined from prescriptions where the NHSBSA has been able to obtain details regarding patient NHS number. Where the same patient appears in the data for more than one practice location they will be counted as one patient for each of the practice locations they appear in.

NB: While NHS numbers are used to formulate these comparators, no personal identifiable data will be released through these comparators.

A patient’s age is determined as the age that is captured whilst processing the prescription for processing e.g. where a patient has been flagged as both 14 and 15 in a month, only those prescriptions where the age has been captured as 14 will have been used.

# How to use these comparators

The measures will enable NHS organisations to identify opportunities for antimicrobial stewardship improvement in children, and report improvement activity.

We envisage that the comparators will be used by NHS Regional teams, integrated care systems, and CCGs in collaboration with local Primary Care Networks and GP practices and with the relevant and appropriate education and training support in place.

The indicators have been designed to be the stimulus for debate and improvement. This facilitates an approach of taking a population perspective to trigger the search for unwarranted variation in care.

Identifying outlying practice and variation enables NHS systems to focus improvement activity.

Data Source:

NHS Business Services Authority -based on data from the NHSBSA’s prescription processing system which contains all NHS prescription data, with the exception of prescriptions which are dispensed in prisons, hospitals and private prescriptions.

Analysis is based on drugs that were reimbursed by the NHSBSA. It excludes items not dispensed and disallowed. If a prescription was issued, but not presented for dispensing or was not submitted to NHS Prescription Services by the dispenser, then it is not included in the data provided.

Data owner & contact details: [nhsbsa@nhs.net](mailto:nhsbsa@nhs.net)

Time Frame: Refreshed monthly

# Data quality assurance

NHS Prescription Services have their own internal quality process to assure the data they provide matches what was originally submitted as part of the prescription processing activity. Some processes are complex and manual therefore there may be random inaccuracies in capturing prescription information which are then reflected in the data but checks are in place to reduce the chance of issues occurring. The processes operate to a number of key performance indicators, one of which is the percentage Prescription Information Accuracy, the target being 99.6% and as at January 2021 the accuracy level achieved over the latest 12-months-rolling period was 99.87%.[[1]](#footnote-1)

Currently (three months to June 2021), 99.16% of all prescription items prescribed within a CCG in England can be linked to an NHS number. Age can be linked to 99.41% of CCG prescribed items. For EPS, the accuracy is 100%. In the three months to October 2020, EPS items accounted for 90% of all English CCG prescribed items.

# Comparator Specifications

## ASC01 – Prescribing of antibacterial items per 1,000 children

|  |  |  |
| --- | --- | --- |
| **Section 1: Introduction / Overview** | | |
| 1.1 | **Title** | ASC01 – Prescribing of antibacterial items per 1,000 children |
| 1.2 | **Definition** | Number of antibacterial items (BNF 5.1) prescribed to children divided by the number of children on registered list size, multiplied by 1,000 for each age band |
| 1.3 | **Reporting Level** | GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level). |
| 1.4 | **Numerator** | Number of items prescribed to children in the selected age band for the following drugs:   |  |  | | --- | --- | | **BNF Section** | **BNF Code** | | Antibacterial Drugs | 0501 | |
| 1.5 | **Denominator** | Number of children on registered list size for the selected age band. |
| 1.6 | **Methodology** | Numerator divided by denominator, multiplied by 1,000 |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the rate of antibiotic prescribing for children at a defined population level  To identify variation in the rate of antibiotic prescribing for children  To identify the trend in antibiotic prescribing for children over time  To identify variation in antibiotic prescribing for children over time |
| 2.2 | **Evidence and Policy Base** | The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources) includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community.  Delivery of these ambitions are supported in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and implementation is led by the NHS England and NHS Improvement Antimicrobial Resistance (AMR) programme and integrated into NHS policies.  [NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics. |

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## ASC02 – Number of children prescribed antibiotics per 1,000 children

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| **Section 1: Introduction / Overview** | | |
| 1.1 | **Title** | ASC02 – Number of children prescribed antibiotics per 1,000 children |
| 1.2 | **Definition** | Number of children prescribed at least one antibiotic divided by the number of children on registered list size multiplied by 1,000 for each age band |
| 1.3 | **Reporting Level** | GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level) |
| 1.4 | **Numerator** | Number of children for each age band prescribed at least one of the following drugs   |  |  | | --- | --- | | **BNF Section** | **BNF Code** | | Antibacterial Drugs | 0501 | |
| 1.5 | **Denominator** | Number of children on registered list size for the selected age band. |
| 1.6 | **Methodology** | Numerator divided by denominator, multiplied by 1,000 |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the proportion of children who are prescribed antibiotics at a defined population level  To identify variation in the proportion of children who are prescribed antibiotics  To identify the trend in the proportion of children who are prescribed antibiotics over time  To identify variation in the proportion of children who are prescribed antibiotics |
| 2.2 | **Evidence and Policy Base** | The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources) includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community.  Delivery of these ambitions are supported in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and implementation is led by the NHS England and NHS Improvement Antimicrobial Resistance (AMR) programme and integrated into NHS policies.  [NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics. |

## ASC03 – Number of children prescribed multiple antibiotics

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| **Section 1: Introduction / Overview** | | |
| 1.1 | **Title** | ASC03 – Number of children prescribed multiple antibiotics |
| 1.2 | **Definition** | Patient count of the number of children prescribed one or multiple antibiotics for each age band |
| 1.3 | **Reporting Level** | GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level) |
| 1.4 | **Numerator** | Number of children for each age band prescribed one, or more than one of the following drugs   |  |  | | --- | --- | | **BNF Section** | **BNF Code** | | Antibacterial Drugs | 0501 | |
| 1.5 | **Denominator** | None |
| 1.6 | **Methodology** | Raw counts of children on one or multiple antibiotics as well as the same figures presented as a percentage of all children prescribed at least one antibiotic – Number of children prescribed one antibiotic divided by the number of children prescribed one antibiotic plus the number of children prescribed more than one antibiotic, multiplied by 1,000.  A patients’ prescribing is considered across all organisations and the patient is subsequently assigned to the most relevant practice or cost centre based on whichever one prescribed the most items, followed by the ODS code. This will attempt to place patients in a GP practice if possible and ensure that all prescribing for a patient is counted and not split across prescribing organisations. |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the number of children who are prescribed one or more antibiotics at a defined population level  To identify variation in the number of children who are prescribed one or more antibiotics  To identify the trend in the number of children who are prescribed one or more antibiotics over time  To identify variation in the number and proportion of children who are prescribed one or more antibiotics |
| 2.2 | **Evidence and Policy Base** | The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources) includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community.  Delivery of these ambitions are supported in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and implementation is led by the NHS England and NHS Improvement Antimicrobial Resistance (AMR) programme and integrated into NHS policies.  [NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics. |

## ASC04 – Prescribing of specific antibiotic items per 1,000 children

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| **Section 1: Introduction / Overview** | | |
| 1.1 | **Title** | ASC04 – Prescribing of specific antibiotic items per 1,000 children |
| 1.2 | **Definition** | Number of items of selected antibiotics prescribed to children divided by the number of children on registered list size, multiplied by 1,000 for each age band |
| 1.3 | **Reporting Level** | GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level) |
| 1.4 | **Numerator** | Number of items prescribed to children in the selected age band for the drugs selected from the following:   |  |  | | --- | --- | | **BNF Chemical Substance / Sub-Paragraph** | **BNF Code** | | Amoxicillin | 0501013B0 | | Cephalosporins | 0501021 | | Co-Amoxiclav (Amoxicillin/Clavul Acid) | 0501013K0 | | Flucloxacillin | 0501012G0, 0501012H0 | | Macrolides | 0501050 | | Nitrofurantoin | 0501130R0 | | Phenoxymethylpenicillin (Penicillin V) | 0501011P0 | | Tetracyclines | 0501030 | | Trimethoprim | 0501080W0 |   Note the user has the option of selecting one or more of the above antibiotic categories |
| 1.5 | **Denominator** | Number of children on registered list size for the selected age band. |
| 1.6 | **Methodology** | Numerator divided by denominator, multiplied by 1,000 |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the rate of antibiotic prescribing for children at a defined population level  To identify variation in the rate of antibiotic prescribing for children  To identify the trend in antibiotic prescribing for children over time  To identify variation in antibiotic prescribing for children over time |
| 2.2 | **Evidence and Policy Base** | The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources) includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community.  Delivery of these ambitions are supported in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and implementation is led by the NHS England and NHS Improvement Antimicrobial Resistance (AMR) programme and integrated into NHS policies.  [NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics. |

## ASC05 – Prescribing of UTI related antibiotic items per 1,000 children

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| --- | --- | --- |
| **Section 1: Introduction / Overview** | | |
| 1.1 | **Title** | Number of Trimethoprim items prescribed to patients aged 70 years plus, per 1,000 patient list size aged 70 years plus |
| 1.2 | **Definition** | Number of Cefalexin, Nitrofurantoin and Trimethoprim items prescribed to children divided by the number of children on registered list size, multiplied by 1,000 for each age band |
| 1.3 | **Reporting Level** | GP Practice/Cost Centre level (aggregated to PCN, CCG, STP, Regional and England level) |
| 1.4 | **Numerator** | Number of items prescribed to children in the selected age band for the following drugs   |  |  | | --- | --- | | **BNF Chemical Substance / Presentation** | **BNF Code** | | Cefalexin | 0501021L0 | | Nitrofurantoin | 0501130R0 | | Trimethoprim | 0501080W0 | |
| 1.5 | **Denominator** | Number of children on registered list size for the selected age band. |
| 1.6 | **Methodology** | Numerator divided by denominator, multiplied by 1,000 |
| **Section 2: Rationale** | | |
| 2.1 | **Purpose** | To identify the rate of antibiotic prescribing associated with urinary tract infections (UTI) for children at a defined population level  To identify variation in the rate of antibiotic prescribing associated with urinary tract infections (UTI) for children  To identify the trend in antibiotic prescribing associated with urinary tract infections (UTI) for children over time  To identify variation in antibiotic prescribing associated with urinary tract infections (UTI) for children over time |
| 2.2 | **Evidence and Policy Base** | The [UK 5-year action plan: Tackling antimicrobial resistance 2019 to 2024](https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources) includes an ambition to reduce antibiotic prescribing in humans by 15% by 2024, and a 25% reduction in antibiotic use in the community.  Delivery of these ambitions are supported in the [NHS Long Term Plan](https://www.longtermplan.nhs.uk/) and implementation is led by the NHS England and NHS Improvement Antimicrobial Resistance (AMR) programme and integrated into NHS policies.  [NICE](https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship) publish antimicrobial prescribing guidelines for a variety of common infections and recommend appropriate use of antibiotics. |

# 

# References

1. Department of Health and Social Care

Antimicrobial resistance (AMR)

Information and resources on the UK’s plans to see antimicrobial resistance contained and controlled by 2040.

First Published 23 July 2014

<https://www.gov.uk/government/collections/antimicrobial-resistance-amr-information-and-resources>

1. Department of Health and Social Care

UK 5-year action plan for antimicrobial resistance 2019 to 2024. Ambitions and actions for the next 5 years, supporting the 20-year vision for antimicrobial resistance (AMR).

Published 24 January 2019

<https://www.gov.uk/government/publications/uk-5-year-action-plan-for-antimicrobial-resistance-2019-to-2024>

1. NHS England

Long Term Plan

First Published 7 January 2019

<https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/>

1. NHS England

The NHS Patient Safety Strategy: This strategy describes how the NHS will continuously improve patient safety, building on the foundations of a safer culture and safer systems.

<https://www.england.nhs.uk/patient-safety/the-nhs-patient-safety-strategy/>

1. Public Health England

English surveillance programme for antimicrobial utilisation and resistance (ESPAUR) report: The ESPAUR report includes national data on antibiotic prescribing and resistance, antimicrobial stewardship implementation, and awareness activities.

First Published 10 October 2014

<https://www.gov.uk/government/publications/english-surveillance-programme-antimicrobial-utilisation-and-resistance-espaur-report>

1. NICE (National Institute for Health and Care Excellence)

Antimicrobial prescribing guidelines

<https://www.nice.org.uk/guidance/health-protection/communicable-diseases/antimicrobial-stewardship>

1. Royal College of General Practitioners

TARGET Antibiotics Toolkit

<https://www.rcgp.org.uk/clinical-and-research/resources/toolkits/amr/target-antibiotics-toolkit.aspx>

1. Department of Primary Care and Public Health, Cardiff University

When should I worry? Your guide to Coughs, Colds, Earache & Sore Throats

Revised edition published October 2016

<http://www.whenshouldiworry.com/>

1. Cabral, C. Ingram, J. Redmond, N. Horwood, J. Blair, P. Hollinghurst, S. Hay, A. Lucas P.

‘Caring for children with coughs: Information and advice for parents’. University of Bristol, Bristol

Published January 2016

<https://child-cough.bristol.ac.uk/>

1. Public Health England

e-Bug: a free educational resource, operated by Public Health England, which contributes to the government’s ongoing action plan to tackle antimicrobial resistance.

<https://www.e-bug.eu/index.php?name=UK-global-teacher-homepage>

1. British Society for Antimicrobial Chaemotherapy

Paediatric antimicrobial stewardship | common paediatric infection management | paediatric ambulation | education | guidelines | training

<https://bsac.org.uk/paediatrics/>

# Appendix 1: Antimicrobial Stewardship Children’s Dashboard

## **Working group**:

|  |  |
| --- | --- |
| **Name** | **Role/Organisation** |
| Elizabeth Beech MBE | Regional Antimicrobial Stewardship Lead South West Region, NHS England and NHS Improvement |
| Margaret Dockey | Prescription Information Services Manager, NHS Business Service Authority |
| Simon Hartnett-Welch | Senior Information Analyst, NHS Business Service Authority |
| Nicholas O’Mahoney | BI Developer, NHS Business Services Authority |
| Testing Group | Tested by multiple users from national NHS organisations and across the seven NHS regions |

1. https://www.nhsbsa.nhs.uk/sites/default/files/2021-05/Accuracy%20Measures%20for%20Publication%20January%202021.pdf [↑](#footnote-ref-1)