

Why is AMS in children so important?

- Children are vulnerable to infections in general, and antibiotics are an essential tool to treating childhood illness and protecting the youngest in our society.
- Children are also at risk of unnecessary exposure to antibiotics, particularly for viral respiratory tract infection, and antibiotic exposure in children can adversely affect the normal development of innate and adaptive immunity, increasing susceptibility to infections in later life (see Shekhar S and Petersen FC, [The darkside of antibiotics: adverse effects on the infant immune defence against infection](#). Frontiers in Pediatrics, 8 (2020)).
- Early diagnosis and prompt effective treatment of serious infection in children is critical but equally important is reducing unnecessary exposure of children to antibiotics.

Is there any supporting education/training?

NHS England have produced resources available on FutureNHS [Paediatric AMS \(South East & Midlands\) - Antimicrobial Resistance Programme - Futures](#).

There is an upcoming webinar: **To register, go to NHS Events**

Weds 19th November 2025
(15:00 - 16:00)



"Seen and not heard – a gut feeling that antibiotic use and antimicrobial resistance in children is a secondary consideration"

How much symptomatic benefit do antibiotics deliver?

	Total Duration untreated	Beneficial effect from antibiotics	NNT for one additional patient to benefit	NNT for one additional adverse effect
Otitis media	4 -12 days	8-12 hours	18	9
Sore throat	8 days	12-18 hours	6-20	15
Sinusitis	12-15 days	24 hours	18	8
Bronchitis	20-22 days	11-24 hours	10-22	24

Slide adapted from [TARGET slid](#)

RCGP has an upcoming webinar:

From guidance to practice: managing paediatric RTIs through clinical scenarios Wednesday 21st January 2026 18.30-19.30 [Sign up - free webinars for 2026: How antimicrobial stewardship can help you | RCGP Learning](#)

We have developed a World Antimicrobial Awareness Week (WAAW) quiz focused on antibiotic use in children — it's time to test your knowledge of antimicrobial prescribing in paediatrics!

This is a great learning opportunity for all healthcare professionals involved in the care or treatment of children, helping to highlight the importance of safe and effective antibiotic use.

Please share the quiz with colleagues who prescribe for or look after children, as well as with community pharmacy teams, using this link: <https://forms.office.com/e/gXmhaSWZVP>.

Answers will be available after form has been submitted. A full list of answers and references is available on the East of England Regional FutureNHS page. [Paediatric AMS quiz - Antimicrobial Resistance Programme - Futures](#)

Why to parents seek a consultation with a healthcare professional?

- It provides a proper 'health-check' and in their opinion, removes any 'health-threat'
 - Parents lack confidence to distinguish self-limiting illnesses from serious ones but believe that clinicians can
- They want advice on what symptoms to look out for and when to seek help
- They do not generally seek antibiotics (although this is something that can be clarified during the consultation). Parents generally believe that Abs are required to treat 'severe' infections rather than to treat bacterial infections:
 - parents often believe that features suggesting a severe infection include high fever, prolonged duration of symptoms and degree of impact on the child (sleep / school)
 - Parents perception of susceptibility also plays a role in their expectation for Abs (younger, underlying health issues)

How can we risk stratify children with respiratory infection?

The STARWAVE tool can be used to predict risk of hospitalisation within 30 days for children presenting with acute cough and respiratory tract infections. These 7 clinical characteristics can distinguish between very low, normal or high risk of future hospital admissions and can be used to guide immediate, delayed or no antibiotic prescribing.

STARWAVE – predicting future hospitalisation among children who have presented in-hours to primary care with acute cough (<28d) and respiratory tract infection

Seven symptoms and signs:	
S	<u>Short</u> duration of illness (≤ 3 days)
T	Parent reported fever in previous 24 hours or <u>temperature</u> $\geq 37.8^{\circ}\text{C}$ at presentation
A	<u>Age</u> < 2 years
R	Clinician reported inter/subcostal <u>recession</u>
W	Clinician reported <u>wheeze</u> on auscultation
A	Current diagnosis of <u>asthma</u>
V	Parent reported moderate/severe <u>vomiting</u> in the previous 24 hours

If 0 or 1 characteristic, 3/1000 risk of hospitalisation in the following 30 days

If 2 or 3 characteristics, 1.5% risk of hospitalisation in the following 30 days

If 4 or more characteristics, 12% risk of hospitalisation in the following 30 days

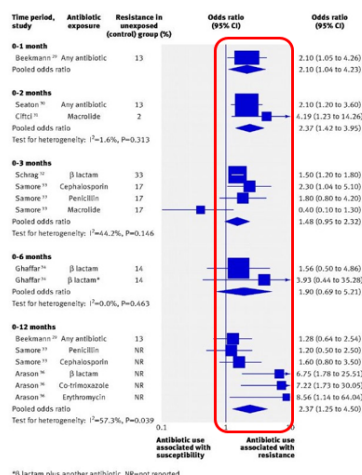
Hay et al The Lancet 2016 [Development and internal validation of a clinical rule to improve antibiotic use in children presenting to primary care with acute respiratory tract infection and cough: a prognostic cohort study - The Lancet Respiratory Medicine](#)

Unintended consequences of antibiotic use in children

Antibiotic use leads to antibiotic resistance, this can be on both a personal and population level as we share our bacteria, including resistant bacteria through touch, fomites, coughs, sneezes etc

Prescribing leads to individual patient level resistance

- Two weeks after prescribing amoxicillin to a child in general practice:
 - Less susceptible organism (MIC tripled)
 - Doubled risk of isolating a resistant strain (RR 1.9, 95%CI 1.2-2.9)¹
- Meta-analysis of 7 studies looking at resistance in respiratory isolates showed that resistance can persist after prescribing for up to 12 months²
 - (OR 2.4, 95% CI: 1.3-4.5)



¹Chung et al, *BMJ* 2007; 35:429; ²Costelloe et al, *BMJ* 2010; 340:c2096

Does antibiotic use have any other consequences later in life?

We are just beginning to understand how antibiotics impact on the gut microbiome and associations with other conditions later in life, such as, allergies, obesity, learning difficulties and autism.

Impact of exposure to antibiotics in early life

Country	Sample size	Exposure period	Hazard ratio/incidence rate ratio (95% CI)			
			Asthma	Food allergies	Intellectual disability	Obesity
Minnesota, USA	14,572	0-2 years	1.90 (1.63-2.23)	1.33 (0.99-1.77)	1.21 (1.03-1.43)	1.20 (1.10-1.32)
United Kingdom	1 million	0-2 years	1.24 (1.22-1.6)	1.33 (1.26-1.40)	Dose dependent increased HR	Not studied
Iceland	22,393	During delivery to 1 st week of life*	1.91 (1.40-2.59)	NS	Not studied	Group II significantly heavier at 1.5 and 4 years

*3 groups: I: during C-section, II: during vaginal delivery, III: for at least 48h within 1st week of life

“..early life microbiome composition is a critical health determinant.... perturbations during key developmental periods can have long term consequences”¹

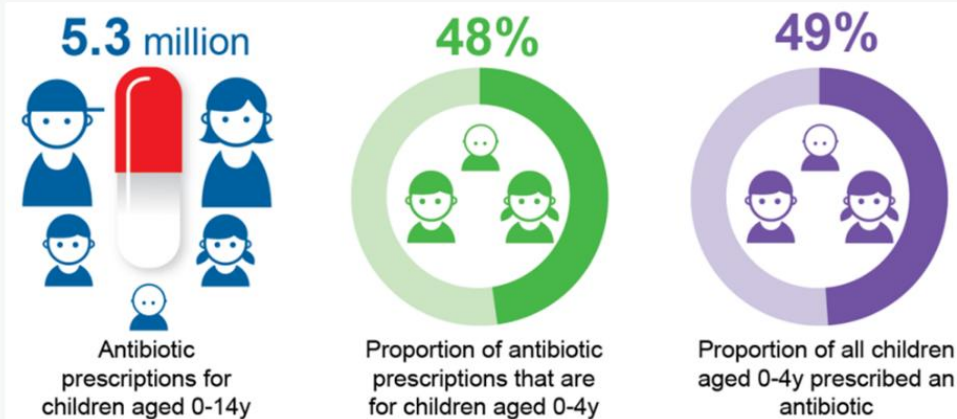
¹Aversa et al, 2021; ²Beier et al, 2025; ³Baeringsdottir et al, 2025

Health inequalities

Children and young people are particularly vulnerable to infections, and their long-term health outcomes are disproportionately affected by antimicrobial use. There is a notable positive association between increasing level of deprivation and increasing rates of antibiotic use in primary care, the rate of total antibiotic use for the most deprived quintile was 65.7% higher than the rate of use in the least deprived quintile in 2019. From 2019 to 2023, the greatest increase in the rate of total antibiotic use was observed in the most deprived quintile (IMD 1) (+4.0% compared to +2.0% in IMD 5). The disparity in total antibiotic use subsequently increased between 2019 and 2023, with the difference in antibiotic use between IMD 1 and IMD 5 rising to 69.1%. Further research is needed to describe the use of antibiotics in children across deprivation indices.

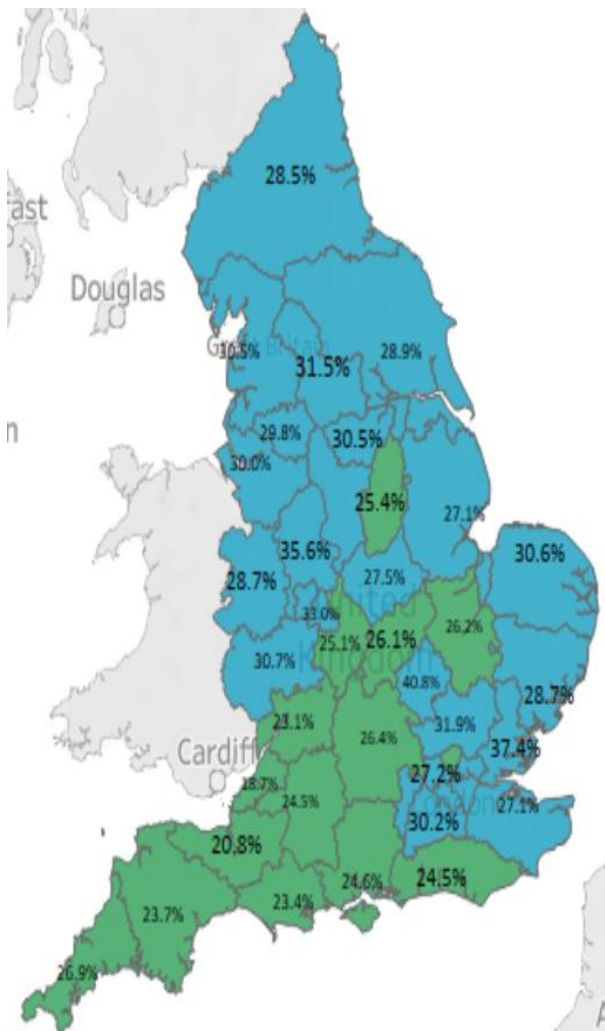
Data on prescribing to children in primary care

Volume of prescribing of antibiotics to children aged 0-14 in England FY 2022-23



ESPAUR report 2022-23 ¹

There is variation across the country. An NHS performance and assessment framework measure aims to return prescribing rates (measured as percentage of children aged 0-9 years prescribed at least one antibiotic in the previous 12 months) to 27%, the value at March 2020 pre-pandemic.



PrescQIPP Oct 25

Top 5 tips to reduce prescribing in children:

- 1/ Use reassurance including 'how long will this last', self-care and safety netting approach using TARGET ([Leaflets to discuss with patients: Leaflets to discuss | RCGP Learning](#)), healthier together resources (www.healthiertgether.nhs.uk) and polar bear leaflet ([Caring for Babies and Children with Cough](#)) for self-limiting infections
- 2/ Use alternatives to antibiotics eg otigo ear drops, hydrogen peroxide cream as per NICE guidance [Summary of antimicrobial guidance: Summary of antimicrobial prescribing guidance - managing common infections | RCGP Learning](#)
- 3/ Refer to pharmacy first for appropriate conditions (sore throat, otitis media, sinusitis, impetigo, insect bites).
- 4/ Use delayed prescribing strategies where appropriate [Paediatric AMS back-up prescribing guidance - Antimicrobial Resistance Programme - Futures](#)
- 5/ Where antibiotics are needed prescribe shortest effective course lengths (3 days for UTI or RTI) [Overview | Pneumonia: diagnosis and management | Guidance | NICENG109 Urinary tract infection \(lower\): Visual summary](#)

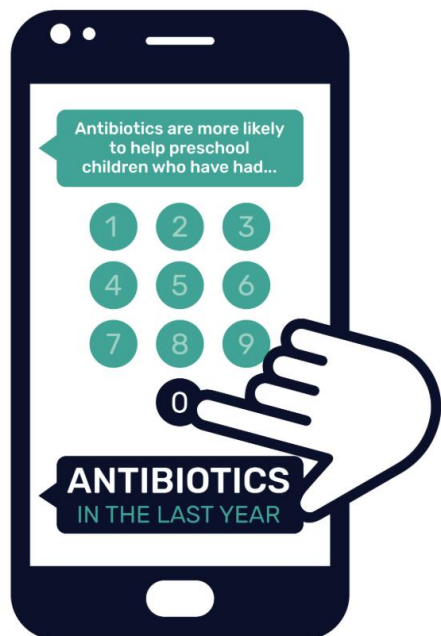
What can we do?

- Share this newsletter.
- Attend the webinar (s).
- Do the quiz and promote it.
- Promote infection prevention measures such as handwashing, food hygiene and vaccination.
- Share key messages with parents/carers
- Use and share the resources below
- Refer to ICB prescribing guidelines and use consultation templates (e.g. Ardens) and diagnostic tools (e.g. Centor, FeverPAIN and STARWAVE) to guide decision making.
- Enable point-of-prescribing alerts (e.g. OptimiseRx and Scriptswitch). Alert templates for common conditions can be found here: https://future.nhs.uk/A_M_R/view?objectID=57258160
- Use CHESTSSS technique in infection consultations [Discussing antibiotics with patients: Finding the right words | RCGP Learning](#)

Key Message Infographics for Parents and Carers:

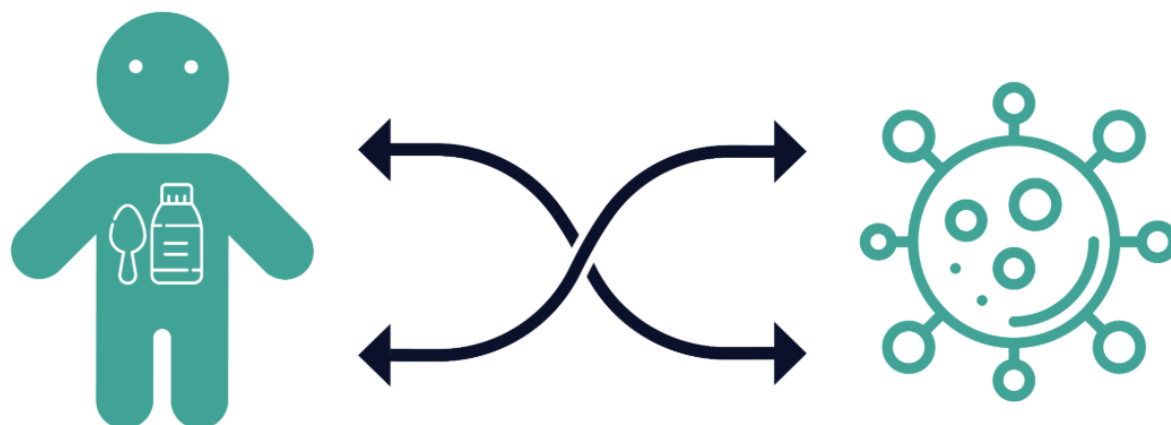
Using evidence-based infographics to increase parents' understanding about antibiotic use and antibiotic resistance: a proof-of-concept study. Oliver Van Hecke et al. *JAC-Antimicrobial Resistance*, Volume 2, Issue 4, December 2020, dlaa102, <https://doi.org/10.1093/jacamr/dlaa102>





Green or yellow
phlegm doesn't mean
your child
needs antibiotics

On average, children with earache...



Just one antibiotic course can change the good bacteria for up to a year in children taking antibiotics for coughs, sore throat or earache

Resources:

TARGET leaflets to share with patients: [Leaflets to discuss with patients: Leaflets to discuss | RCGP Learning](#) All leaflets have been developed in collaboration with clinicians and patients and have received the Crystal Mark for Plain English. Web versions can be sent directly to patients by copying the URL link. Translations and user guides are available by clicking on downloads.

CHESTSSS acronym for infection consultations: [Discussing antibiotics with patients: Finding the right words | RCGP Learning](#) Concerns, History and Exam, Expectations, Symptoms, Timeline, Shortcomings, Self-care, Safety-netting

Healthier together website: www.healthiertogether.nhs.uk Integrated website for parents/carers and young people as well as healthcare professionals

Tools for schools: [Tools for schools - Antimicrobial Resistance Programme - Futures](#) A toolkit containing information such as a newsletter for parents/carers and links to resources such as e-Bug and antibiotic guardian for local authorities and schools

Midlands and South East paediatric resources [Paediatric AMS \(South East & Midlands\) - Antimicrobial Resistance Programme - Futures](#)

This contains:

- Key messages for primary care prescribers
- Gut microbiome information for healthcare professionals and patients
- Back-up prescribing resources
- Respiratory tract infection in paediatrics training pack
- Example prescribing incentive scheme using STARWAVE
- Links to other resources

Superbodies campaign resources [Protect your child's Super Body this winter - Mid and South Essex Integrated Care System](#) Leaflets and public health campaign materials

Andybiotic campaign [Keep Antibiotics Working | Campaigns | Campaign Resource Centre](#) This UKHSA product offers a suite of digital, print and social assets to help raise awareness of the correct and incorrect ways to use antibiotics, supporting people to take antibiotics correctly, keep antibiotics working, and tackle antimicrobial resistance (AMR).

e-bug: <https://www.e-bug.eu> This UKHSA product provides free resources for educators, community leaders, parents and caregivers to educate children and young people aged 3-16 years and ensure they are able to play their role in preventing infection outbreaks and using antimicrobials appropriately.

