



Antimicrobial Stewardship in the UK

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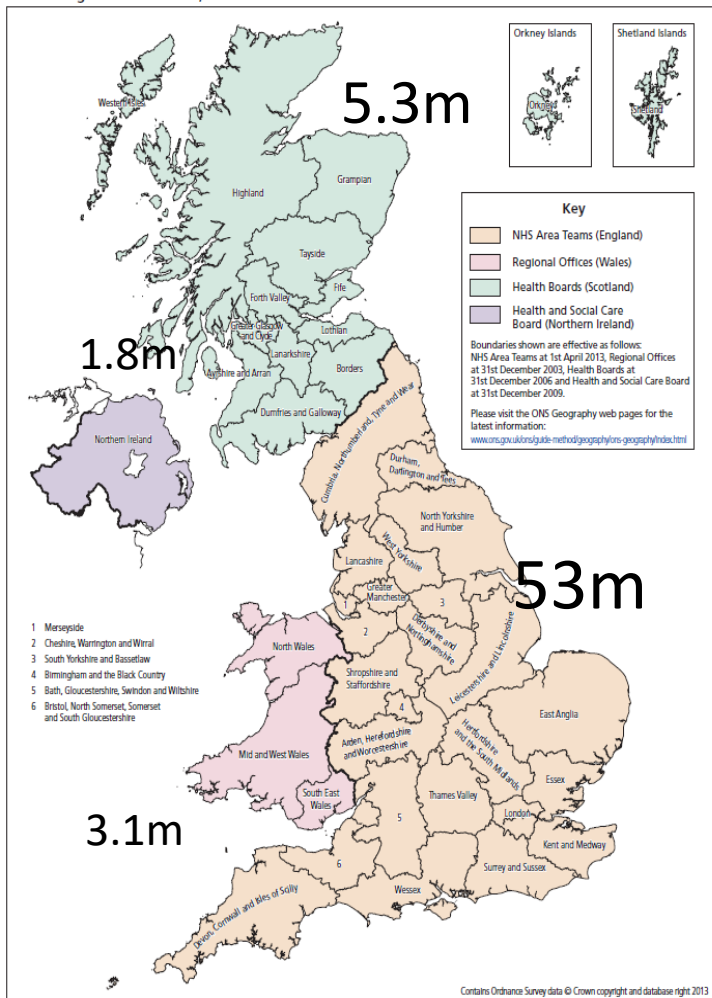
@BSACandJAC | @TheUrgentNeed

www.bsac.org.uk



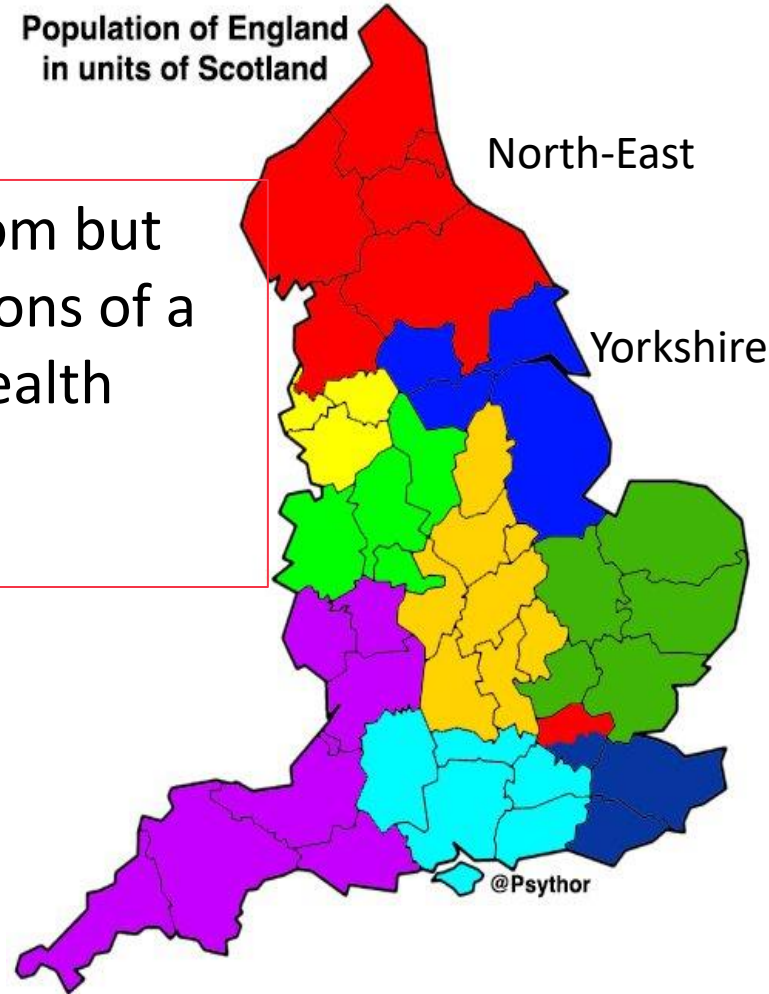
United Kingdom of England, Scotland, Wales & Northern Ireland

United Kingdom: Health Areas, 2013



Population of England in units of Scotland

One Kingdom but four variations of a National Health Service





NHS England (pre 2013): national AMS guidance but no antimicrobials usage or resistance data in hospitals

- Informal regional networks of:
 - Medical microbiologists and infectious diseases
 - Antimicrobial pharmacists in hospitals
- National AMS guidelines (Nov-2011) for hospitals: “Start Smart then Focus” and community: TARGET.
- No AMR information or usage data available at national level in hospitals, but available in community
 - Local information only for hospitals
- HCAI performance based around *C.difficile* and MRSA bacteraemia reduction
- Antimicrobial Stewardship for Acute Trust (ASAT -AMS for Acute Trusts) tool to measure performance
- Commissioners / external assurance agencies (CQC/TDA/Monitor) could review see AMS programme and results.



2013: 1st UK 5 year AMR Strategy

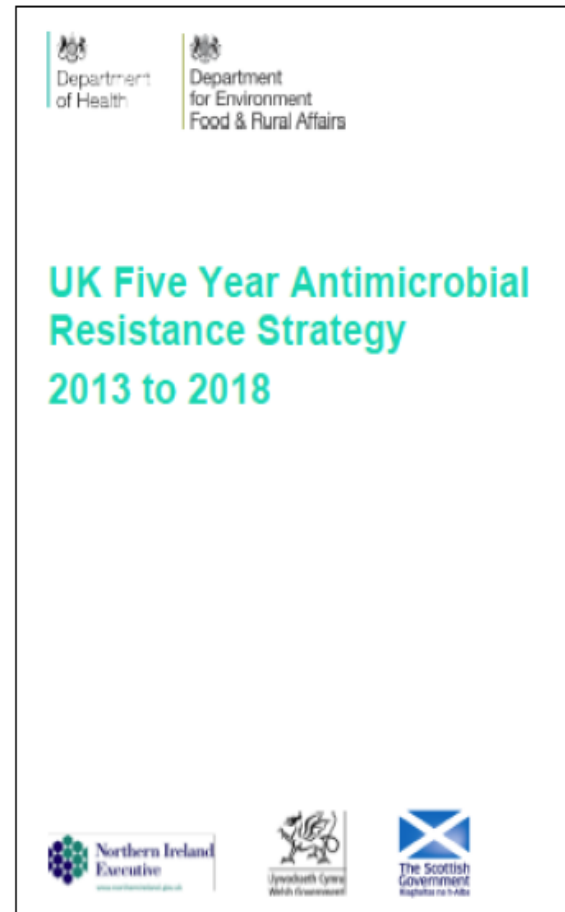


CMO Annual Report 2011*



*published: March 2013

'One Health'

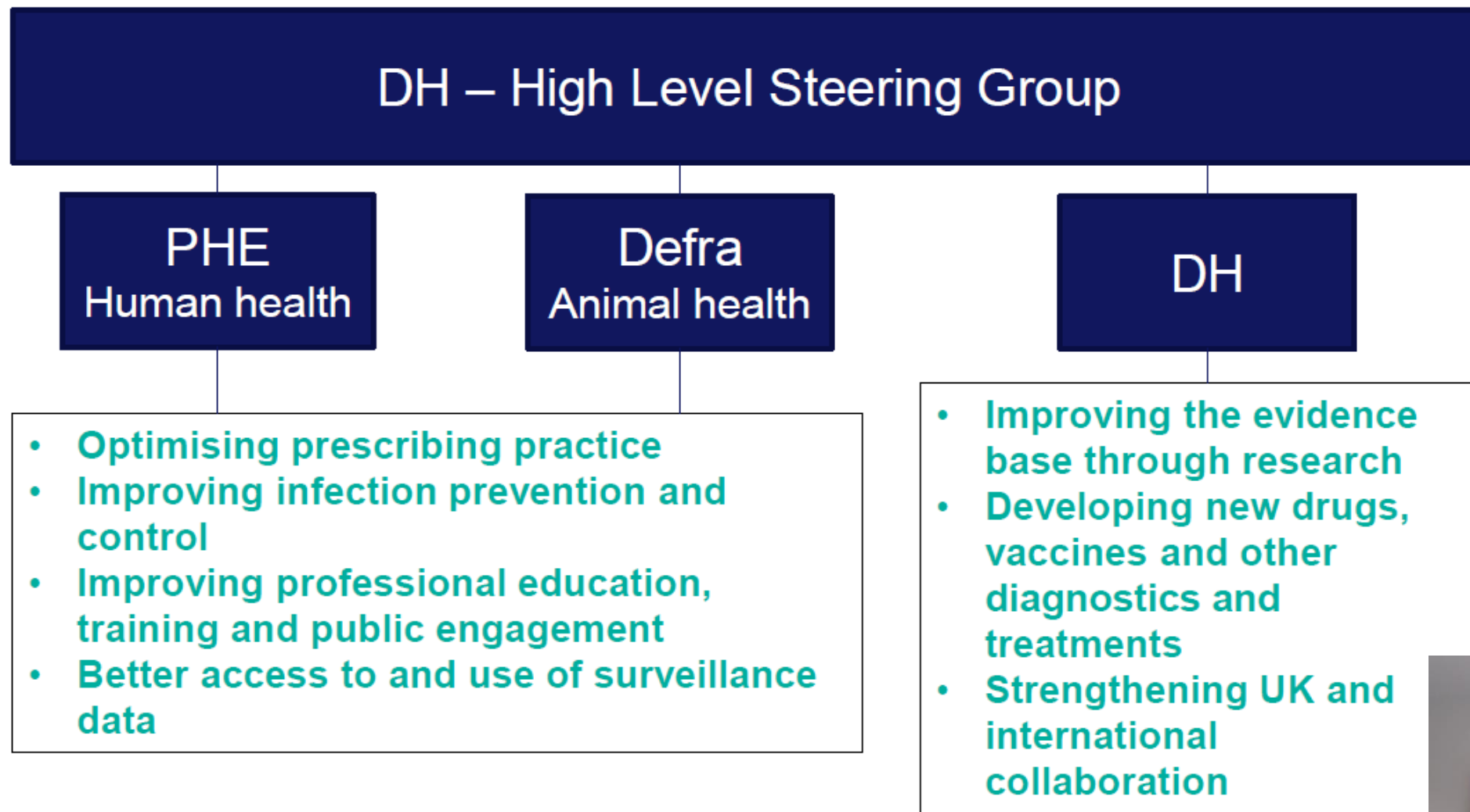


Strategic aims

1. Improve the knowledge and understanding of AMR
2. Conserve and steward the effectiveness of existing treatments
3. Stimulate the development of new antibiotics, diagnostics and novel therapies



UK 5year AMR Strategy: 7 key areas for action



Scotland, Wales and Northern Ireland developed their own version of the UK 5 year AMR NAP

Improved antimicrobial stewardship



- Few **NICE infection guidelines** covering hospitals & primary care, but now AMS guidelines & quality standards for all
- NICE AMS: processes & systems guideline & standards (NG15 & QS121) embedded in all sectors
- NICE AMS: changing risk related behaviour in general population (NG63) – includes AB use, self-care & IPC
- Jul-17, NICE rapid infection guidelines for all sectors
- AMS now included in **Health & Social Care Act 2008 IPC Code of Practice**. All healthcare providers are registered by CQC against this Act



NICE AMS Structure & Governance

Mandated in NHS Contract (NICE NG15 AMS) & H&SC Act 2008 IPC Code of Practice (2015)

Accountability at hospital executive / board level

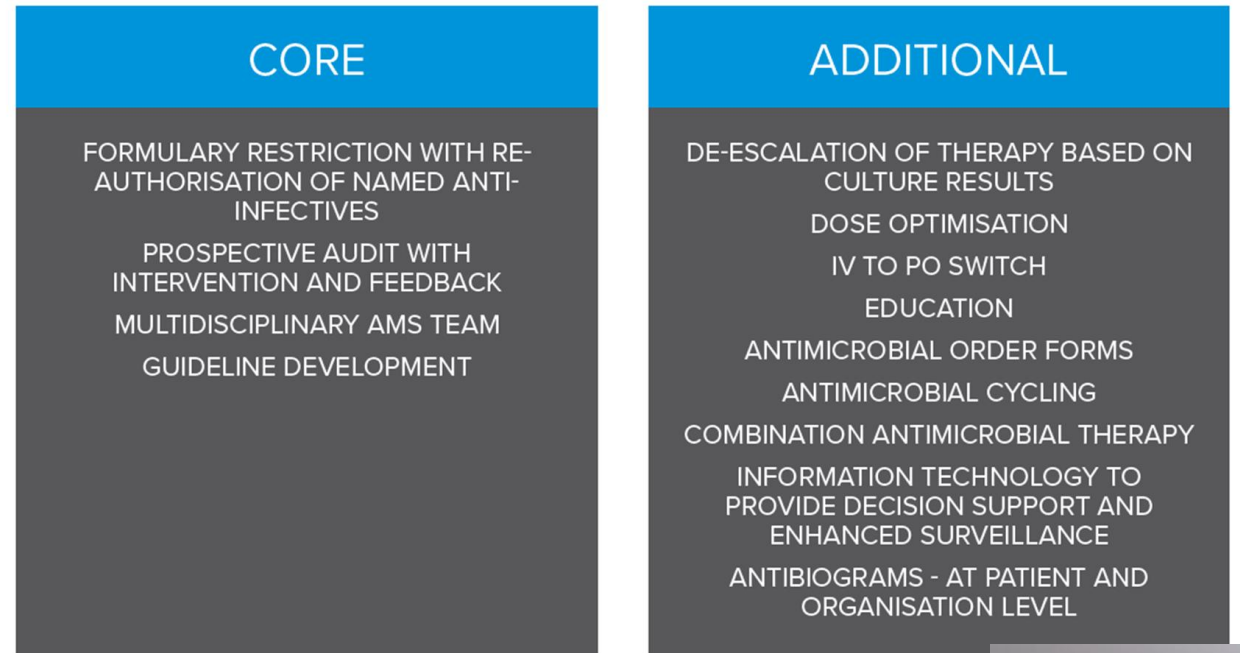
- Drug & Therapeutics, IPC & AMS teams

Dedicated AMS resource

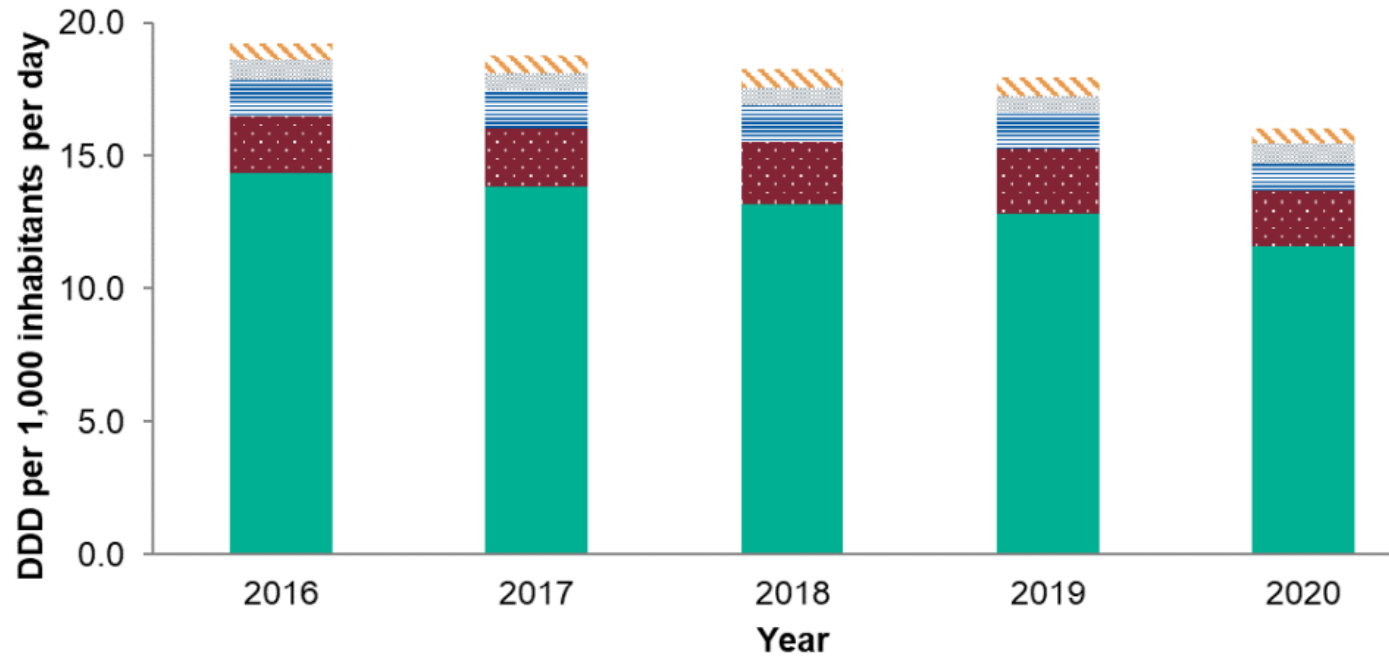
- core team of Infectious Diseases or micro doctor and clinical pharmacist

AMS Committee

- Core team (above)
- Acute care physician, surgeon
- Senior pharmacist, anaesthetist, paediatrician, senior nurse
- primary care rep (whole health economy approach).
- **Lead IPC Dr & Nurse, Sepsis lead**



WHO IS PRESCRIBING?

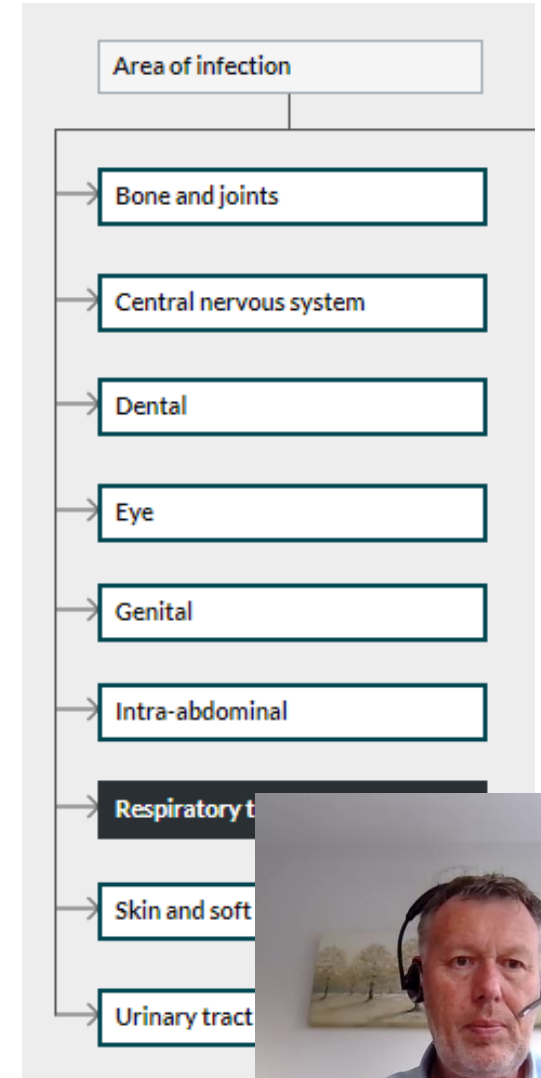


■ General Practice
 ■ Hospital Inpatient
 ▨ Hospital Outpatient
▨ Dentist
 ▨ Other Community

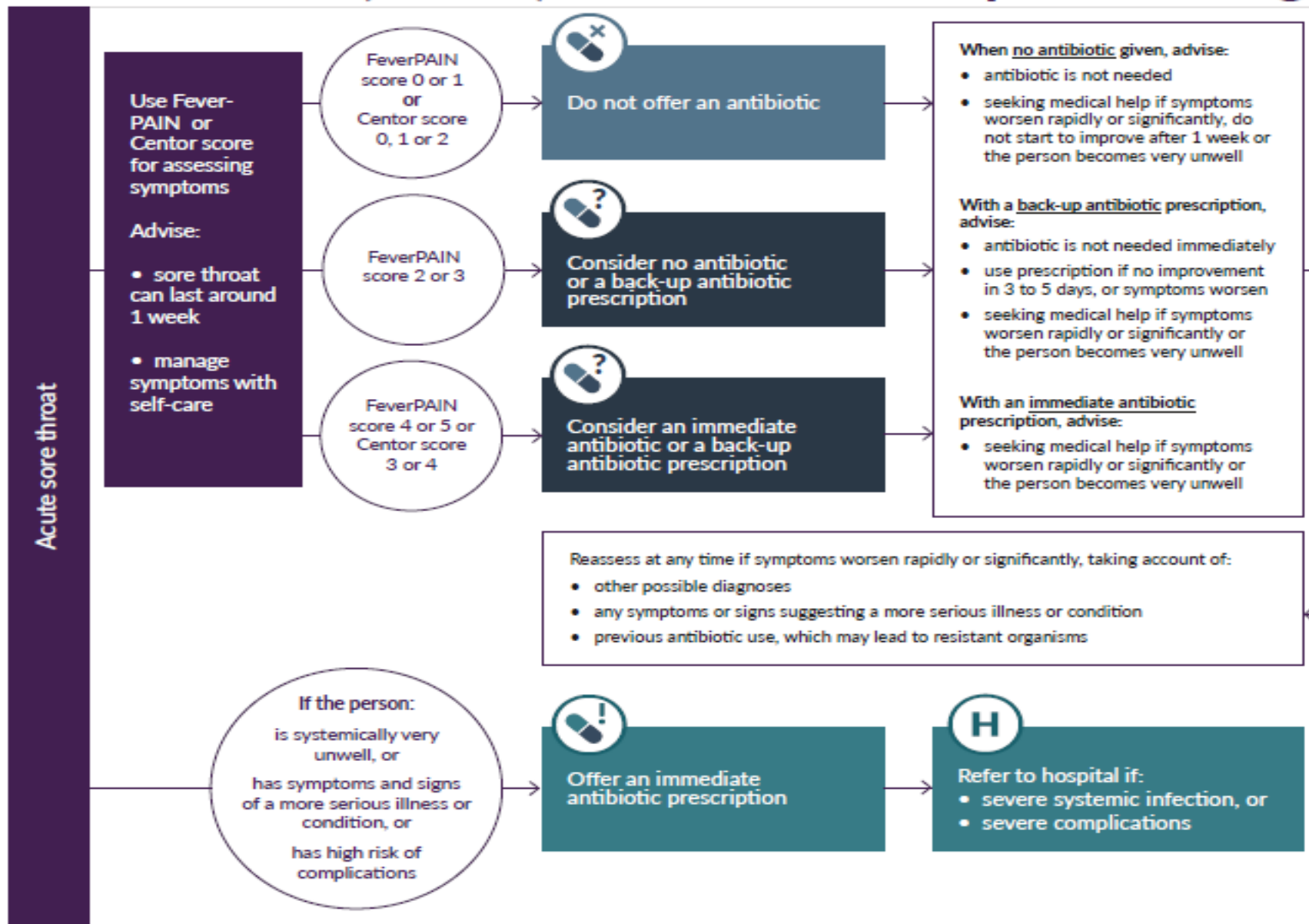


NICE Common Infection Guidelines

- Infection guidelines are being developed for all **common infections** within primary care and hospitals
- All **upper and lower respiratory, urinary tract** and **skin infections** and *C.difficile* have been published.
- Dental & eye infections will soon be published
- Each guideline has a **baseline assessment** of current practice for hospitals and general practice to complete with an **implementation plan**
- <https://pathways.nice.org.uk/pathways/antimicrobial-prescribing-for-common-infections>



Sore throat (acute): antimicrobial prescribing



i Self-care

- Consider paracetamol for pain or fever, or if preferred and suitable, ibuprofen
- Drink adequate fluids
- Some evidence that medicated lozenges can help reduce pain in adults
- No evidence was found for non-medicated lozenges, mouthwashes, or local anaesthetic mouth spray on its own

💊 Evidence on antibiotics

- Antibiotics make little difference to how long symptoms last or the number of people whose symptoms improve
- Withholding antibiotics is unlikely to lead to complications
- Possible adverse effects include diarrhoea and nausea

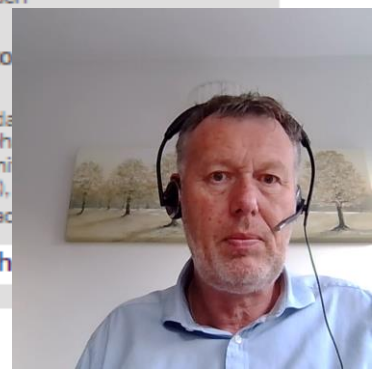
🦠 FeverPAIN score

- Fever, Purulence, Attend within 3 days or less, Severely Inflamed tonsils, No cough or coryza
1 point for each

🦠 Centor

- Tonsillar exudate or cervical lymphadenopathy
fever (>38°C),
1 point for each

First published



RCGP TARGET: patient information leaflet – standard approach for respiratory infections

Antibiotic Information Leaflet

Treating your infection

Mark 20454
Charter approved by Plain English Campaign

Patient Name

Your doctor or nurse recommends that you self-care Back-up antibiotic prescription issued

Your infection	Usually lasts	How to treat yourself better for these infections, now and next time	When should you get help? Contact your GP practice or contact NHS 111 (England), NHS 24 (Scotland dial 111), or NHS Direct (Wales dial 0845 4647)
<input type="checkbox"/> Middle-ear infection	4 days	<ul style="list-style-type: none"> Have plenty of rest. Drink enough fluids to avoid feeling thirsty. Ask your local pharmacist to recommend medicines to help your symptoms or pain (or both). Fever is a sign the body is fighting the infection and usually gets better by itself in most cases. You can use paracetamol (or ibuprofen) if you or your child are uncomfortable as a result of a fever. Other things you can do suggested by GP or nurse: 	<p>1. to 8. are possible signs of serious illness and should be assessed urgently. Phone for advice if you are not sure how urgent the symptoms are.</p> <ol style="list-style-type: none"> If you develop a severe headache and are sick. If your skin is very cold or has a strange colour, or you develop an unusual rash. If you feel confused or have slurred speech or are very drowsy. If you have difficulty breathing. Signs can include: <ul style="list-style-type: none"> breathing quickly turning blue around the lips and the skin below the mouth skin between or above the ribs getting sucked or pulled in with every breath. If you develop chest pain. If you have difficulty swallowing or are drooling. If you cough up blood. If you are feeling a lot worse. <p>Less serious signs that can usually wait until the next available GP appointment:</p> <ol style="list-style-type: none"> If you are not improving by the time given in the 'Usually lasts' column. In children with middle-ear infection: if fluid is coming out of their ears or if they have new deafness. Other
<input type="checkbox"/> Sore throat	7 days		
<input type="checkbox"/> Common cold	10 days		
<input type="checkbox"/> Sinusitis	18 days		
<input type="checkbox"/> Cough or bronchitis	21 days		
<input type="checkbox"/> Other infection: days









Back-up antibiotic prescription ONLY to be collected in days if you do not feel better or feel worse.

Collect from: GP reception GP or nurse Pharmacy

- Colds, most coughs, sinusitis, ear infections, sore throats, and other infections often get better without antibiotics, as your body can usually fight these infections on its own.
- The more we use antibiotics, the greater the chance that bacteria will become resistant to them so that they no longer work on our infections.
- Antibiotics can cause side effects such as rashes, thrush, stomach pains, diarrhoea, reactions to sunlight, other symptoms, or being sick if you drink alcohol with metronidazole.

Never share antibiotics and always return any unused antibiotics to a pharmacy for safe disposal

Leaflet developed in collaboration with these professional societies

All sections can be personalised and added to by the GP

“Usually lasts” section educates patients about when to consult

Safety netting

Back-up prescription

Information about antibiotics & resistance

Adapted version for community pharmacists & OOH. Multiple languages & pictorial version. UTI version available for GPs & community pharmacists

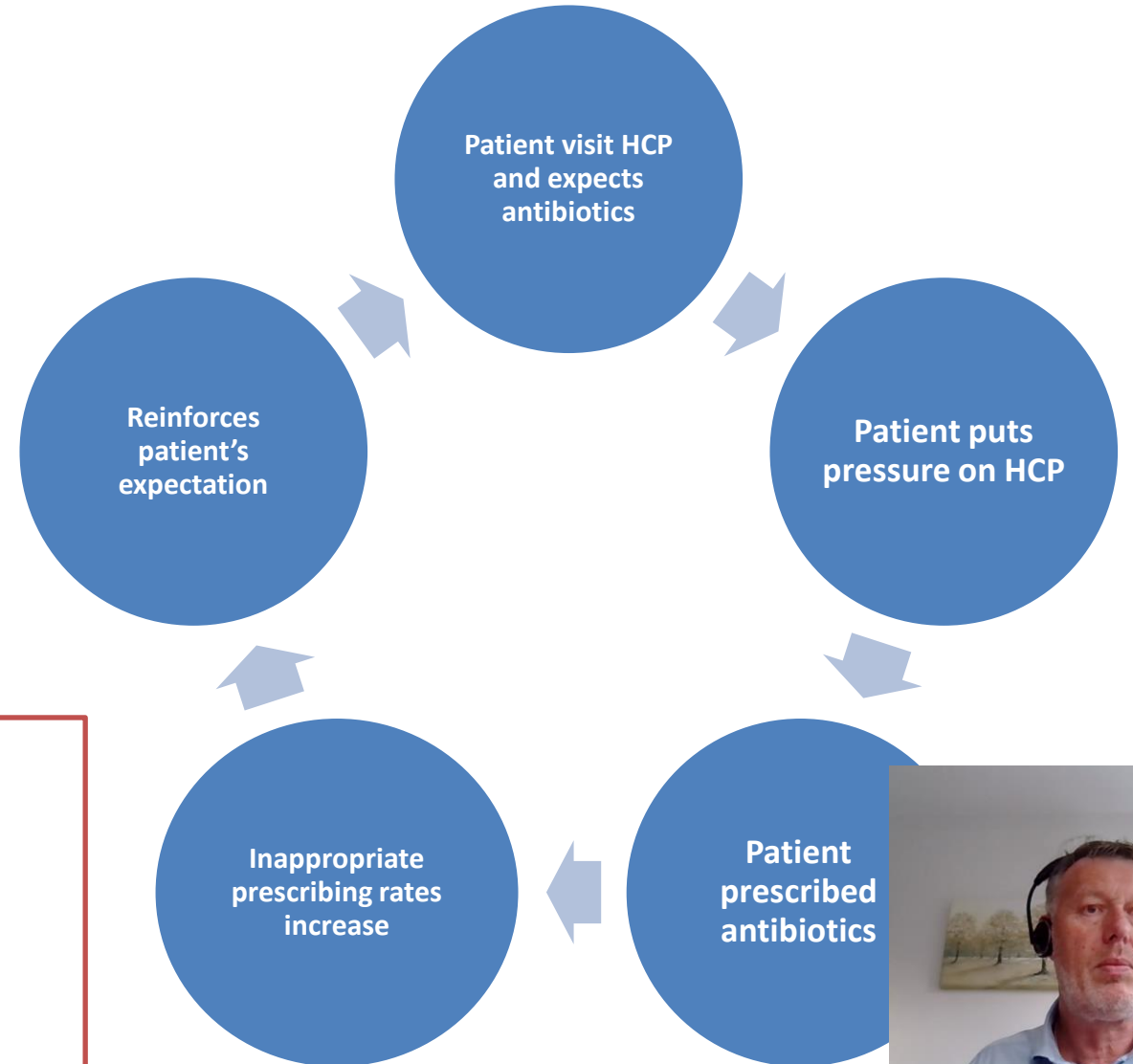


Good self-care advice from community pharmacy can reduce inappropriate antibiotic prescribing

- **Acute cough:**
41% prescribed vs ideal of 10%
- **Bronchitis:**
82% prescribed vs ideal of 13%
- **Rhinosinusitis:**
88% prescribed vs ideal of 11%
- **Sore throat:**
59% prescribed vs ideal of 13%

Community pharmacy consultation service


- Referrals from NHS 111 direct to pharmacy & direct from GP



Antibiotic Prescription Checklist in community pharmacy

for Pharmacy team

To access the TARGET Antibiotics patient leaflets, scan the QR code or visit: www.rcgp.org.uk/TARGET-patient-leaflets



SCAN ME

I have given the following patient information leaflet:



- UTI UTI for older adults dental
- RTI RTI pictorial other
- managing common infections (self-care)

Administering the flu vaccine. Please tick as appropriate.

- I have discussed flu vaccine eligibility with the patient
- I have given the flu vaccine on site

The Antibiotic Checklist has not been fully completed because:

- the patient's representative did not know the information
- the antibiotics are supplied by delivery service. Consider including a patient information leaflet with the prescription.
- the antibiotics are already dispensed
- the patient declined
- other reason. Please write the reason in the space below.

4 Staff complete on preparation and hand out of prescriptions. Retain for audit.
Antibiotic Checklist Version 2. Published April 2021. Review date: July 2022.

for Patients

Antibiotic Checklist

Help us to Keep Antibiotics Working. Please tick

Are the antibiotics for you? yes no

If they are not for you, please fill in the rest of this form for the person named on the prescription

Are you taking any other medicines? yes no don't know


Have you taken the same antibiotics in the last 3 months? yes no don't know


Are you allergic to any antibiotics? yes no don't know


If yes, please provide the following information about your allergy:


Antibiotic name Type of allergy


Do you have one of these common infections? Tick if yes.


chest 

throat 

ear 

urine 


tooth 


skin 


Or something else?


Please indicate here.


Does this describe you? Tick if yes.

problem with kidney function 

problem with liver function 

breast feeding 

pregnant 

over 65 

Have you had a flu vaccine this year? yes no don't know

Your pharmacist can tell you about the things that you can do to help you get better, and give you a leaflet with more information.

Please let your pharmacist know if you need this information in a different language.

Please continue overleaf →

Patients complete on hand in of prescription. Staff retain for audit.
Antibiotic Checklist Version 2. Published April 2021. Review date: July 2022.

Checklist points

Date this checklist was completed:

Assessing the antibiotic prescription. Please tick as appropriate.

I have checked n/a yes no

... for allergies, risk factors, other medication interactions.

... treatment with the same antibiotic in the previous 3 months.

This information is collected from page 1.

... the antibiotic against the local guidance.

... the antibiotic is appropriate for the infection indicated.

... the dose is correct for the indication and patient.

... the duration is correct for the indication.

I have contacted the prescriber about this antibiotic prescription. Please write the reason and outcome below. n/a yes no

The following antibiotics have been dispensed

- None
- Amoxicillin
- Flucloxacillin
- Nitrofurantoin
- Doxycycline
- Clarithromycin
- Phenoxymethylpenicillin (Penicillin V)
- Metronidazole
- Trimethoprim
- Co-Amoxiclav

other Please specify the antibiotic in the space below.

Giving advice on antibiotics. Please tick as appropriate. n/a yes no

I have discussed antibiotic resistance with the patient/carer as the patient has had the same antibiotics in the last three months.

I have checked the Patient responses to the statements overleaf and given advice as required.

Tick the circles next to the statements on overleaf

Staff complete on preparation and hand out of prescriptions. Retain for audit.
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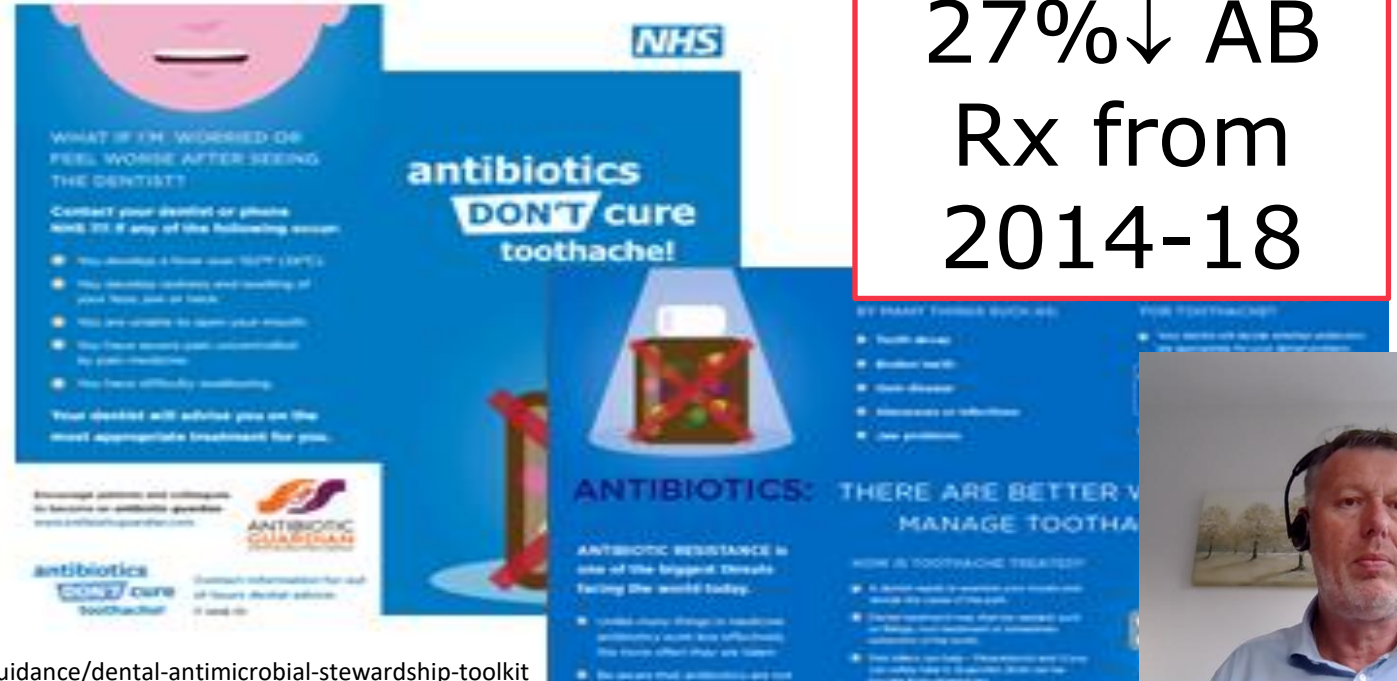
www.england.nhs.uk/wp-content/uploads/2021/09/Pharmacy-Quality-Scheme-guidance-September-2021-22-Final.pdf
<https://www.rcgp.org.uk/TARGET-patient-leaflets>



Antibiotics for dental infections

Fear of dentists: pain, smell, etc
 NHS dentists: difficult to access so see GP, primary prevention not included
 Perverse incentives: same payment for AB Rx and drainage of abscess

RESOURCES: DENTAL TOOLKIT – POSTER AND PATIENT INFORMATION LEAFLET



27%↓ AB Rx from 2014-18



Hospital Antimicrobial Stewardship

Sepsis

ANTIMICROBIAL STEWARDSHIP Treatment algorithm

↓ AMR

Start Smart

Then Focus

DO NOT START ANTIBIOTICS IN THE ABSENCE OF CLINICAL EVIDENCE OF BACTERIAL INFECTION

CLINICAL REVIEW & DECISION AT 48-72 HOURS

Clinical review, check microbiology and make a clear plan. Document this decision

1. Take thorough drug allergy history
2. Initiate prompt effective antibiotic treatment within one hour of diagnosis (or as soon as possible) in patients with severe sepsis or life-threatening infections^a
3. Comply with local antimicrobial prescribing guidance
4. Document clinical indication (and disease severity if appropriate), dose^b and route[#] on drug chart and in clinical notes
5. Include review/stop date or duration
6. Obtain cultures prior to commencing therapy where possible (but do not delay therapy)

1. STOP
2. IV to oral switch
3. Change antibiotic
4. Continue
5. OPAT*

Document Decision & Next Review Date or Stop Date

DOCUMENT ALL DECISIONS

^a In accordance with surviving sepsis patient safety <http://www.england.nhs.uk/wp-content/uploads/2014/04/surviving-sepsis-campaign-2014-2016.pdf>
^b According to weight/age in children refer to local formulary
[#] Use appropriate route in line with severity/patient factors
^{*} Outpatient Parenteral Antibiotic Therapy



Improving outcomes from serious infections

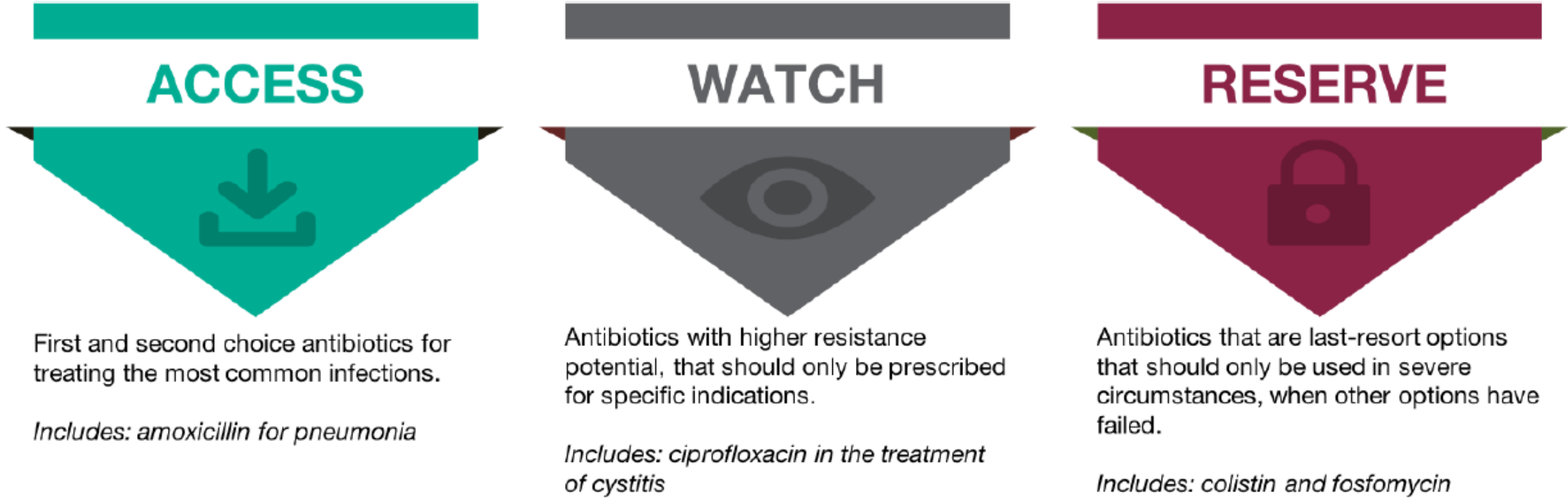
- **Suspicion of sepsis (SoS)** is reason for 25-38% of 1.9m emergency admissions each year, and **cause of 60% of deaths** (78% are in people >75 years old & 88% >65 yrs)
- 4 year hospital clinical improvement scheme to improve screening for sepsis and timely treatment with sepsis 6 bundle
 - **Screening**: from 48% to **87%**. **Treatment in 60min**: from 50% to **80%**
 - **AB in hospitals: 6%↑/year**. Antimicrobial stewardship at day 3 review.
 - **Mortality rate** decreased from **7.6% to 6.7%** from sepsis
- **NEWS2** (national early warning scores) roll out across cc (ambulance, GPs, hospitals) - Speaking same language.



WHO EML Antibiotic AWaRe Lists 2017

All countries to adapt within 2 years

Adapt to local AMR patterns: Access 1st & 2nd choice for most



Access list in England: Amoxicillin / ampicillin, Penicillin – all forms, Co-trimoxazole, Doxycycline, Flucloxacillin, Fosfomycin oral, Fusidate, Gentamicin, Metronidazole, Nitrofurantoin, Pivmecillinam, Tetracycline, Trimethoprim. **Watch list** includes all cephalosporins & fluoroquinolones

AMR NAP
10%↓ wat
reserve ar
from 2017



Targets to reduce total and broad spectrum antibiotic (<10%) prescribing in primary care



NHS England and NHS Improvement

Antimicrobial Stewardship data reporting against NHS AMR metrics 2021/22

Select commissioner grouping (includes country selection):
Region NORTH EAST AND YORKSHIRE



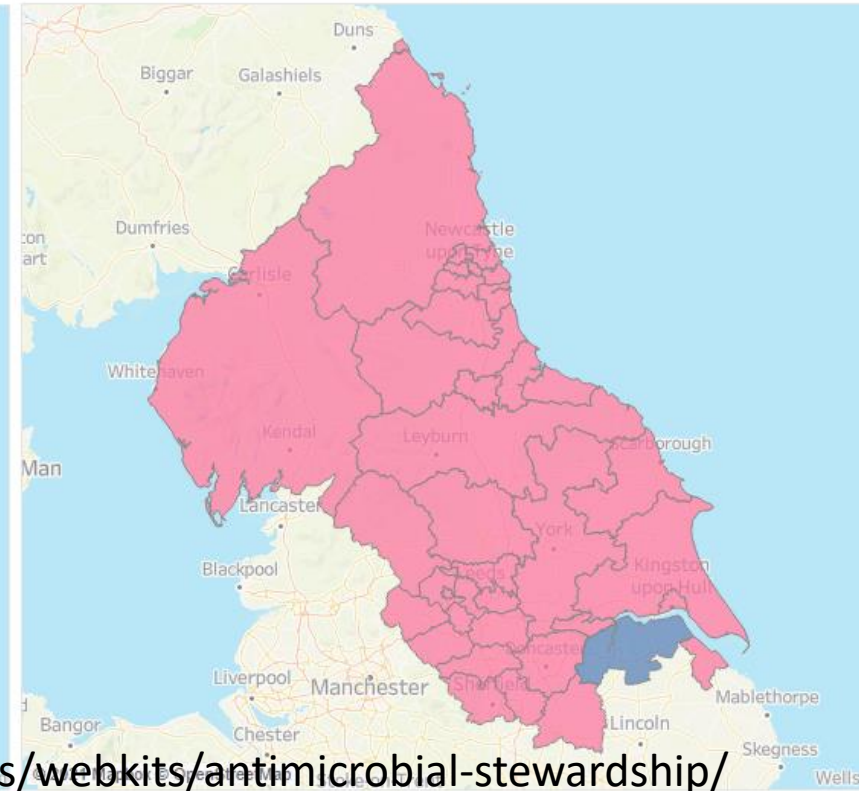
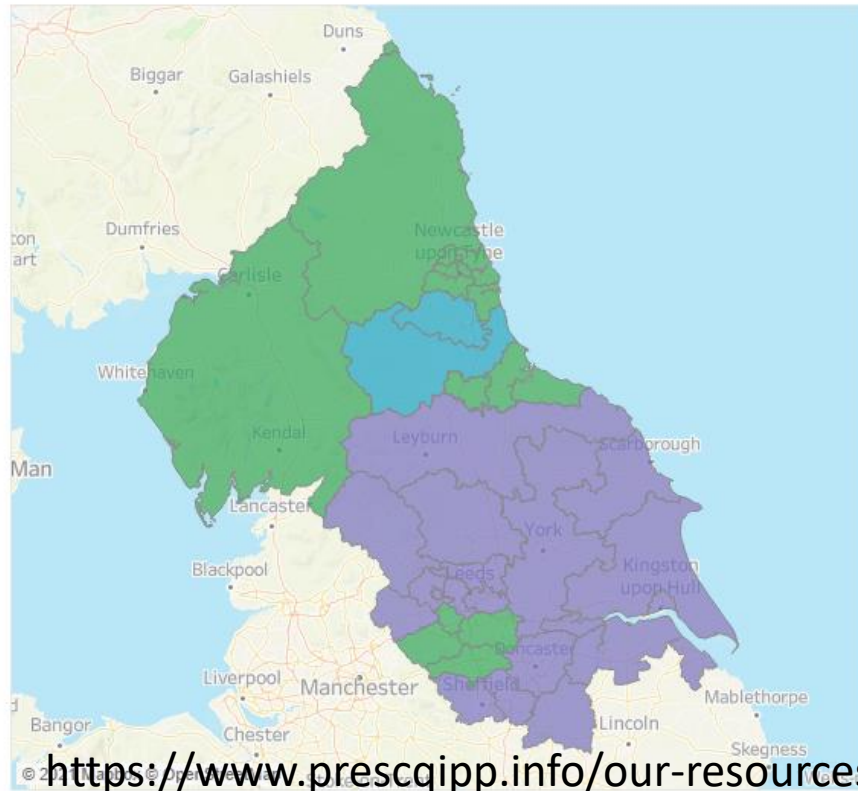
Select 12m rolling period to:

Aug-21



Commissioner interactive maps Antibacterial items/STAR-PU showing 12 months rolling data to Aug-21

Commissioner interactive maps proportion of co-amoxiclav, cephalosporin & quinolone items showing 12 months rolling data to Aug-21



<https://www.prescqipp.info/our-resources/webkits/antimicrobial-stewardship/>

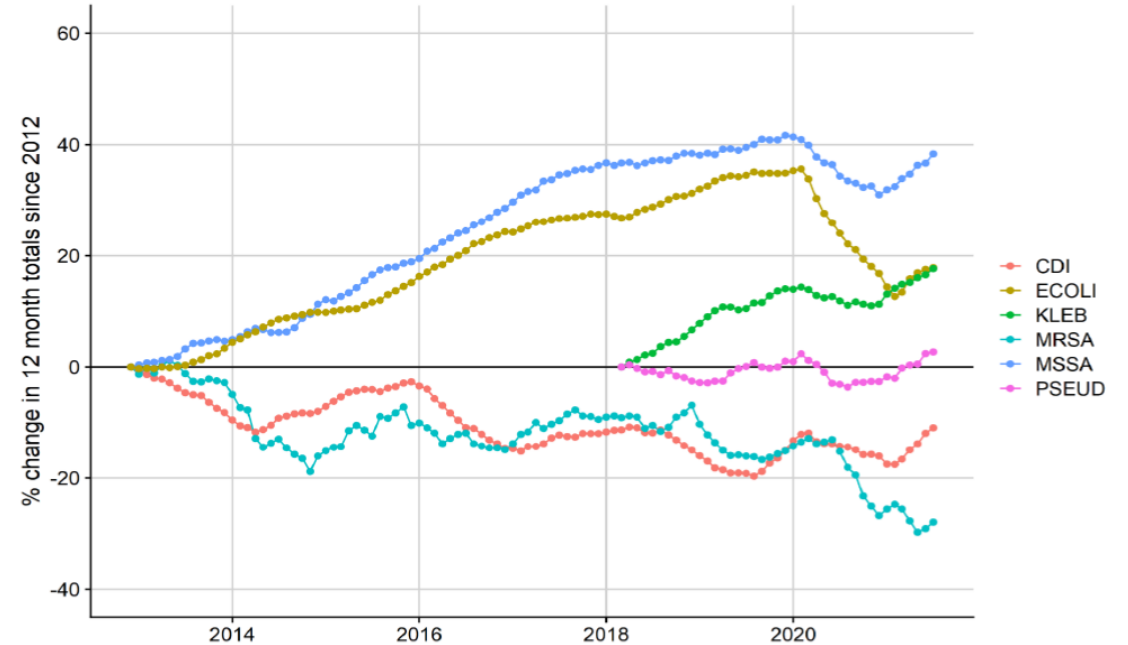
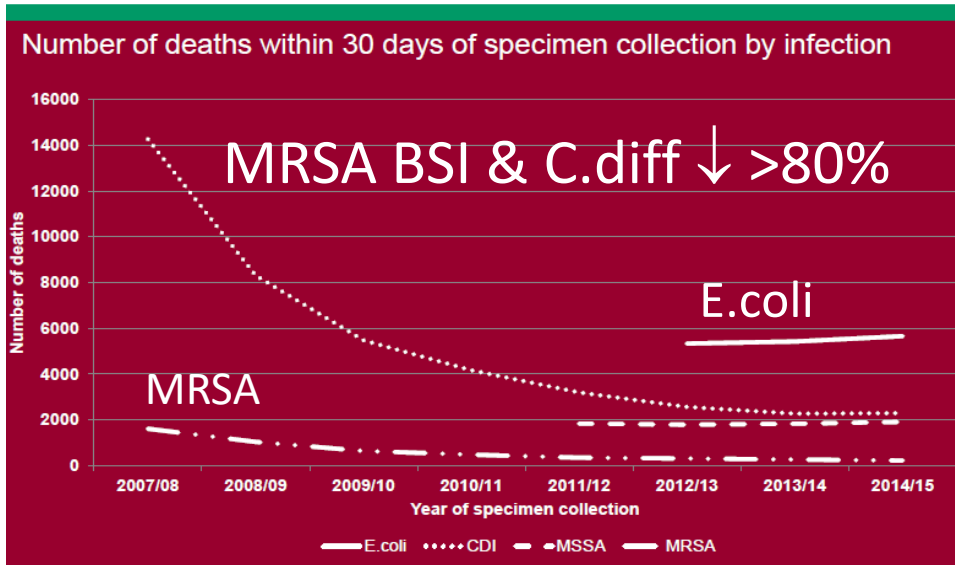


Revised focus on HCAI & GNBSI

Bug	30 day mortality rate (2015/6)
MRSA	29.4%
MSSA	20.0%
E.coli	15.3% (19.1% 75y+)
C.difficile	15.1%



Mortality



2019-24 AMR NAP focuses on reducing healthcare associate Gram negative blood stream infection to ↓ by 50%



Single information source updated monthly for AMR & AMU (open access) PHE AMR Fingertips

Domains	No of indicators available at indicated geographies		
	Acute Trust	CCG	GP
Supporting NHS England initiatives	7	5	-
Antimicrobial resistance	1	14	-
Antibiotic prescribing	6	7	4
Healthcare-associated infections	21	14	-
Infection prevention and control	4	-	-
Antimicrobial stewardship	2	1	-

Supporting NHS England Initiatives Antimicrobial Resistance Antibiotic Prescribing **Health Care Associated Infection** Infection Prevention and Control Antimicrobial Stewardship All Trust All Clinical Commissioning Group

Overview Compare indicators Map **Trends** Compare areas Area profiles Definitions Download

Area type: Acute Trusts Benchmark: England

Area: Leeds Teaching Hospitals
Search not available

Indicator: Blood culture sets performed by reporting acute Trust and quarter Show all indicators

Compared with benchmark ● Better ● Similar ● Worse ● Lower ● Similar ● Higher ○ Not Compared * a note is attached to the value, hover over to see more details

Trends for **Leeds Teaching Hospitals NHS Trust** All in England

<http://fingertips.phe.org.uk/profile/amr-local-indicators>



PHE AMR / AMU data to learn from better performing peers eg hospital AB Rx

Data view: **Area profiles** | Geography: **Leeds Teaching Hospitals NHS Trust** | Topic: **Antibiotic Prescribing**

Acute Trusts in North East and Yorkshire NHS Region

Quintiles: Best (lightest) to Worst (darkest) | Not applicable

* a note is attached to the value, hover over to see more details

Export table as image | Export table as CSV file



Indicator	Period	Leeds Teaching Hospitals		NHS region	England	England		
		Count	Value	Value	Value	Worst/Lowest	Range	Best/Highest
Total antibiotic prescribing DDDs per 1000 admissions; by quarter and trust	2020/21 Q4	203,742	5,875.1	4247.2*	4727.4	37,348.7		1,067.7
Proportion of total antibiotic prescribing from the "Access" category of the WHO Essential Medicines List AWaRe index; by quarter and acute trust	2020/21 Q4	95,232	46.7%	49.1%*	47.1%	16.5%		76.3%
Proportion of total antibiotic prescribing from the "Watch" category of the WHO Essential Medicines List AWaRe index	2020/21 Q4	95,841	47.0%	46.3%*	48.4%	71.5%		22.0%
Proportion of total antibiotic prescribing from the "Reserve" category of the WHO Essential Medicines List AWaRe index	2020/21 Q4	12,012	5.9%	4.2%*	3.9%	36.8%		
Carbapenem prescribing DDDs per 1000 admissions; by quarter and acute trust	2020/21 Q4	2,635	76.0	60.5*	83.1	1,353.2		



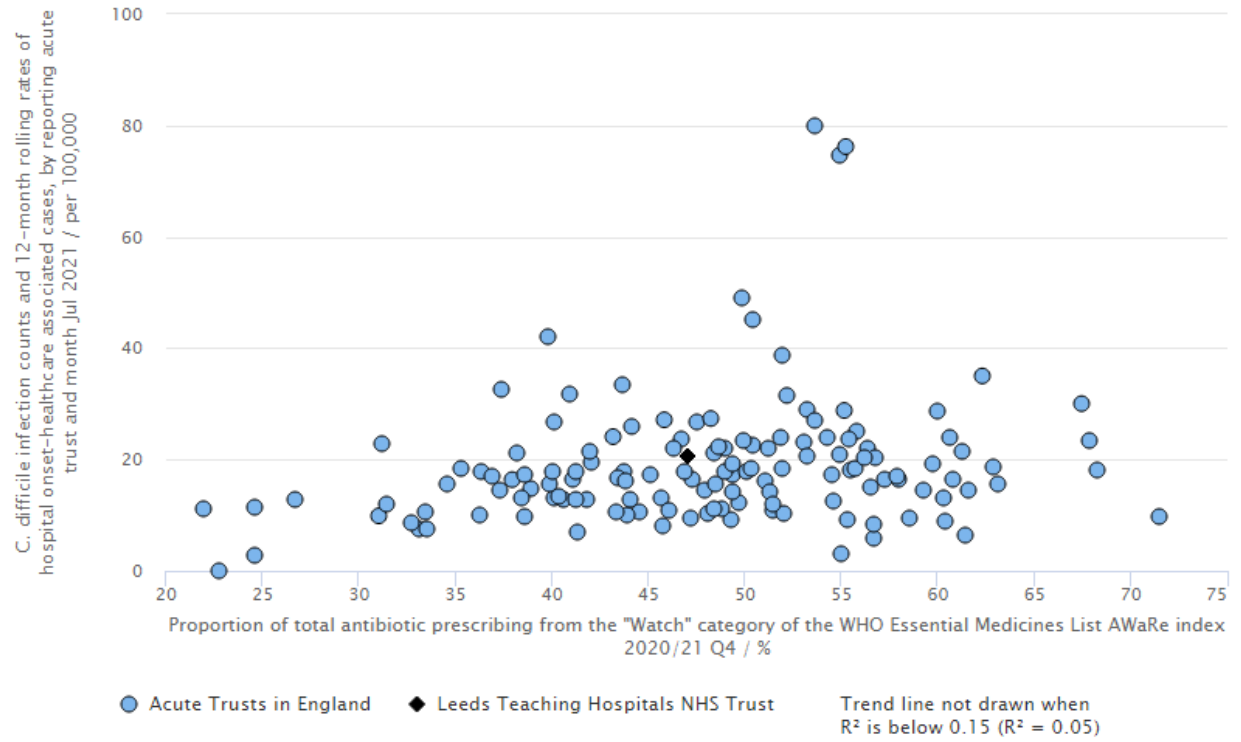
Data view **Compare indicators** ⋮ 🔍 Geography **Leeds Teaching Hospitals NHS Trust** ⋮ **Acute Trusts in North East and Yorkshire NHS Region** 🔽 Topic **Antibiotic Prescribing** ⋮

🔍 < > Indicator on X axis **Proportion of total antibiotic prescribing from the "Watch" category of the WHO Essential Medicines List AwaRe index** 2020/21 Q4 Proportion - % ⋮

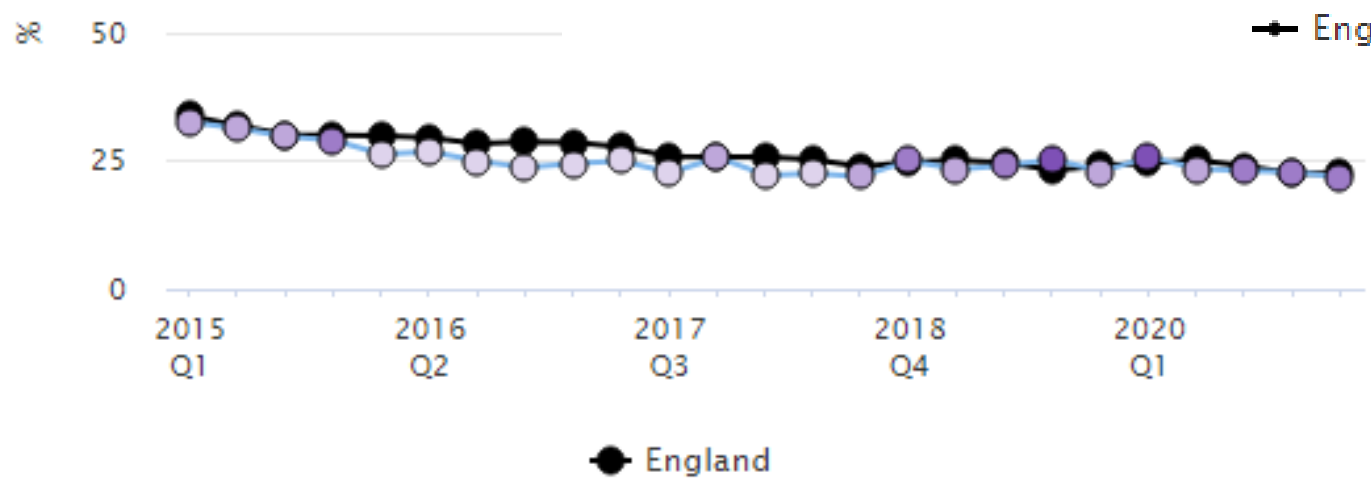
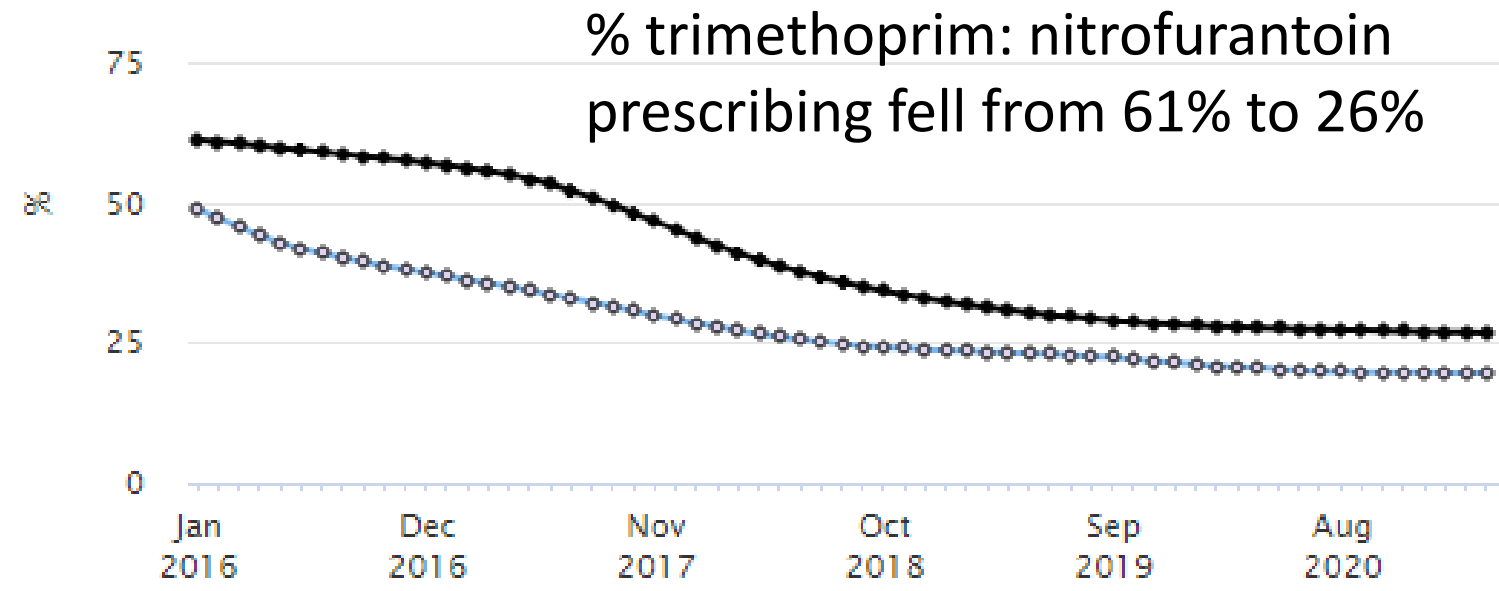
🔍 < > Indicator on Y axis **C. difficile infection counts and 12-month rolling rates of hospital onset-healthcare associated cases, by reporting acute trust and month** Jul 2021 Crude rate - per 100,000 ⋮

Areas **All in North East and Yorkshire NHS Region** **All in England** 🖨️ Export chart as image 📄 Export chart as CSV file

- Highlight Leeds Teaching Hospitals NHS Trust Add regression line & R²



Impact of switching from trimethoprim to nitrofurantoin for lower UTI in the community on E.coli resistance rates



E.coli resistance to trimethoprim fell from 33% to 22% but nitrofurantoin also continued to fall from 27% to 3.0%





Public Health
England

Professional education and training: National Antimicrobial Prescribing & Stewardship Competences

- Each of the **five dimensions** includes statements which describe the activity and outcomes which prescribers should be able to demonstrate.
- **1) Infection prevention and control** (5 statements)
- **2) Antimicrobial resistance and antimicrobials** (6 statements)
- **3) Prescribing antimicrobials** (8 statements)
- **4) Antimicrobial stewardship** (8 statements)
- **5) Monitoring and learning** (4 statements)



Antimicrobial prescribing and stewardship competencies



Introductory e-learning module

The screenshot displays the e-Learning for Healthcare website. At the top left is the e-LH logo with the tagline 'e-Learning for Healthcare'. To its right is a quote: 'An extraordinary project in terms of breadth and skill of content' followed by a closing bracket and 'e-Learning Age - Judges citation'. On the far right, there are 'Register' and 'Log in' buttons, and the NHS Health Education England logo. A blue navigation bar contains links for Home, Programmes, About, Latest News, Support, Demo, and Contact Us, along with a search bar. The main content area features a large purple banner for 'Reducing Antimicrobial Resistance' with the subtitle 'An e-learning package to support staff in understanding the threats posed by antimicrobial resistance'. To the right of the banner is a microscopic image of a bacterium. Below the banner, there is a 'Menu' section with four items: 'Antimicrobial Resistance' (selected), 'Meet the team', 'Open access session', and 'How to access'. The 'Antimicrobial Resistance' section contains two paragraphs of text. To the right of this section is a box stating 'In partnership with' followed by the NHS Health Education England logo.

e-LH
e-Learning for Healthcare

An extraordinary project
in terms of breadth and
skill of content } e-Learning Age -
Judges citation

Register **Log in**

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Home Programmes About Latest News Support Demo Contact Us search... Q

Reducing Antimicrobial Resistance

An e-learning package to support staff in understanding the threats posed by antimicrobial resistance



Menu

- Antimicrobial Resistance
- Meet the team
- Open access session
- How to access

Antimicrobial Resistance

The Reducing Antimicrobial Resistance programme has been designed to support all health and social care staff – both clinical and non-clinical - in a variety of settings to understand the threats posed by antimicrobial resistance, and ways they can help to tackle this major health issue. This programme has been developed by Health Education England in collaboration with Public Health England and NHS England.

Antibiotic (antimicrobial) resistance poses a major threat to everyday life and modern day medicine where lives could be lost as a result of antibiotics not working as they should. All health and social care staff, as well as the public, have a very important role in preserving the power of antibiotics and in controlling and preventing the spread of infections.

In partnership with

NHS
Health Education England

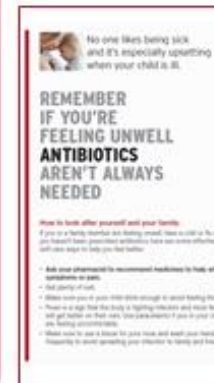
Aimed at all HCPs including carers



Keep Antibiotics Working campaign in England on TV & radio & posters / leaflets each winter since 2017



Antibiotic resistance advert - keep antibiotics working and take your doctor's advice



- 78% of public would not ask GP for antibiotics
- 93% of GPs – helped them say no to antibiotic requests

Taking antibiotics you don't need means they won't be there when you and really need them tomorrow.



Seriously Resistant in Leeds

- www.seriouslyresistant.com
- Public facing website – AMR info, Q&As (based on info needs), videos
- Pledge hedge & community champions
- Red bags for April in community pharmacies
- Schools campaign
- Council run
- 24000 pledges

Cornwall AMR Group is a OneHealth network including vets and farmers



Always complete a full course of antibiotics, exactly as your doctor has advised. If you stop your treatment early the infection could come back.

The future of antibiotics is in our hands
seriouslyresistant.com

Sharing antibiotics with friends and family, or storing them for another time, can do more harm than good.

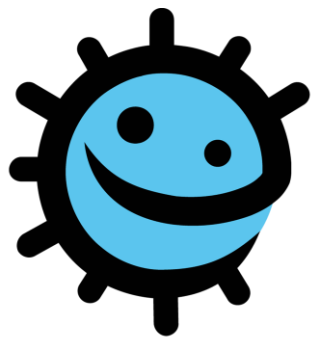
The future of antibiotics is in our hands
seriouslyresistant.com

We need to act to give heart bypass patients the best chance to get better.

The future of antibiotics is in our hands
seriouslyresistant.com

We need to act to make sure cancer treatments continue to work.

The future of antibiotics is in our hands
seriouslyresistant.com



e-Bug

Resources for schools and children

'SUPERBUGS: JOIN THE FIGHT' SCHOOL PROGRAMME
 Raising awareness of antimicrobial resistance in schools across the UK.

1. Interactive e-Bug activities (learning phase)

- Microbes
- Spread of infection
- Antibiotics & antibiotic resistance

2. Resource development (consolidation phase)

- Poster, Song, video
- Further project in community



3. Antibiotic Guardian pledge (action setting phase)

- Example pledges or make own
- Encourage friends and family to pledge online



A FREE EDUCATION RESOURCE FOR UPPER PRIMARY & LOWER SECONDARY SCHOOLS

Alexander Fleming's death-defying worldly-wonder antibiotic drugs have saved us for the last 90 years. But bacterial resistance is growing, doomsday approaches. What better way to fight back than with a musical of epic proportions?



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Figure 1: 3 stage design of Antibiotic Guardian programme for Girls

Scottish Antimicrobial Prescribing Group



- Funded as a **multidisciplinary** national forum in March 2008 by Scottish Government as part of The Scottish Management of Antimicrobial Resistance Action Plan 2008.
- SAPG **co-ordinates & delivers** a national AMS framework:
 - **antibiotic consumption** and **prescribing guidance**
 - **resistance surveillance**
 - organisational **accountability** for antimicrobial stewardship
 - antimicrobial **prescribing education** for healthcare professionals and infection management
- Highly successful model with representation from all 14 Health Boards

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Safeguarding
antibiotics for
Scotland, now and
for the future



www.sapg.scot/



Summary for AMS in UK

- UK 5 year AMR strategies has been a big lever for making improvements quickly
 - Improved open access AMR and usage reporting for UK
 - Setting targets (and seeing early reduction) in antimicrobial usage in primary care and dentistry, but not hospital in-patients due to sepsis targets.
 - Little impact on AMR so far, except trimethoprim, but only amoxicillin-clavulanate resistance in E.coli and Kleb pneum. increasing significantly
 - Improved mandatory education strategy for AMR & AMS in all healthcare staff
 - Giving AMS a higher priority alongside IPC
 - Moving the focus away from *C.difficile* & MRSA towards GNBSI
 - Better patient engagement not to ask for antibiotics from their GP
- Scotland probably has the best model for AMS that demonstrates continuous improvement without using incentive schemes

