Healthcare associated Gram-negative bloodstream infections in England

David Charlesworth

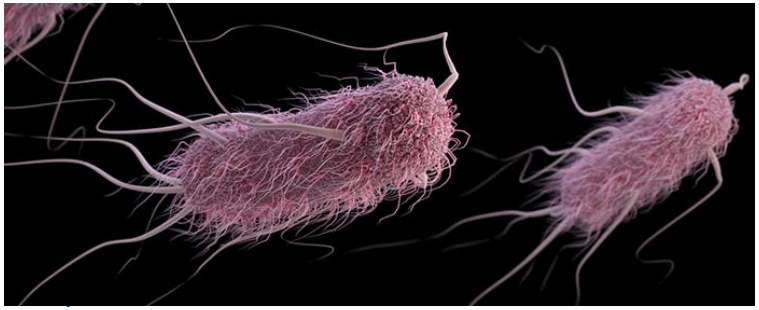
NHS England and NHS Improvement

Background

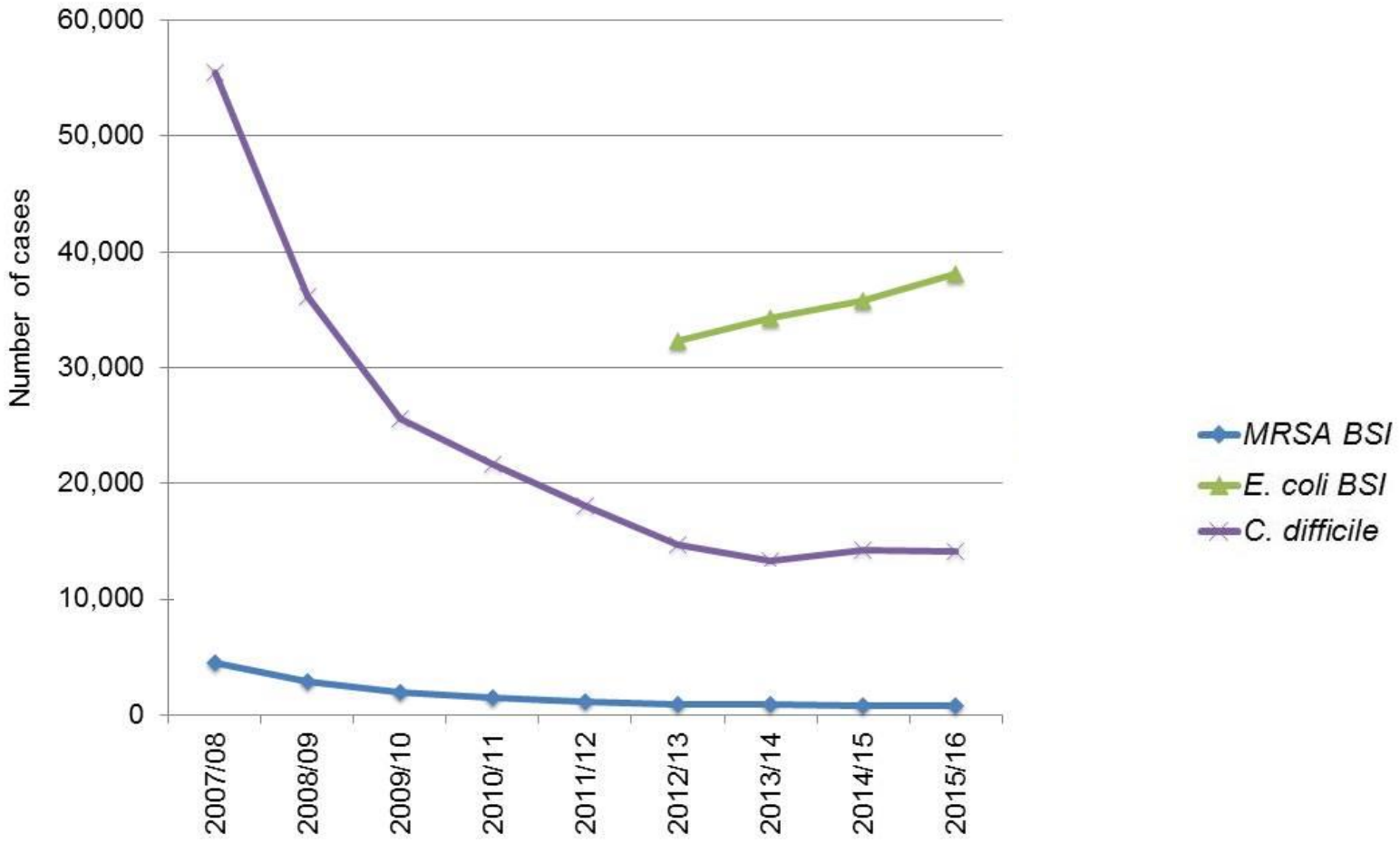
- In May 2016, the Government announced its ambition to halve healthcare associated GNBSIs by 2021.

- This was in response to the final report of the global facing independent review of Antimicrobial Resistance (AMR) led by Lord O'Neill.

- GNBSI believed to have contributed to approximately 5,500 NHS patient deaths in 2015.



Context


60,000
50,000
40,000
30,000
20,000
10,000
0
Number of cases
2007/08
2008/09
2009/10
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
MRSA BSI
E. coli BSI
C. difficile

Context

MRSA bacteraemia

January - March 2017	January - March 2018
1.7 out of every 100,000 people	1.7 out of every 100,000 people

C. difficile infection

January - March 2017	January - March 2018
22 out of every 100,000 people	22 out of every 100,000 people

E. coli bacteraemia

January - March 2017	January - March 2018
71 out of every 100,000 people	69 out of every 100,000 people

Epidemiology of *E.coli* bacteraemia in England

ELSEVIER

Journal of Hospital Infection

Volume 95, Issue 4, April 2017, Pages 365-375

Epidemiology of *Escherichia coli* bacteraemia in England: results of an enhanced sentinel surveillance programme

J. Abernethy [a, b], R. Guy [a], E.A. Sheridan [a, c], S. Hopkins [d, e], M. Kiernan [f], M.H. Wilcox [g], A.P. Johnson [a], R. Hope [a]

the E. coli bacteraemia sentinel surveillance group

Show more

https://doi.org/10.1016/j.jhin.2016.12.008

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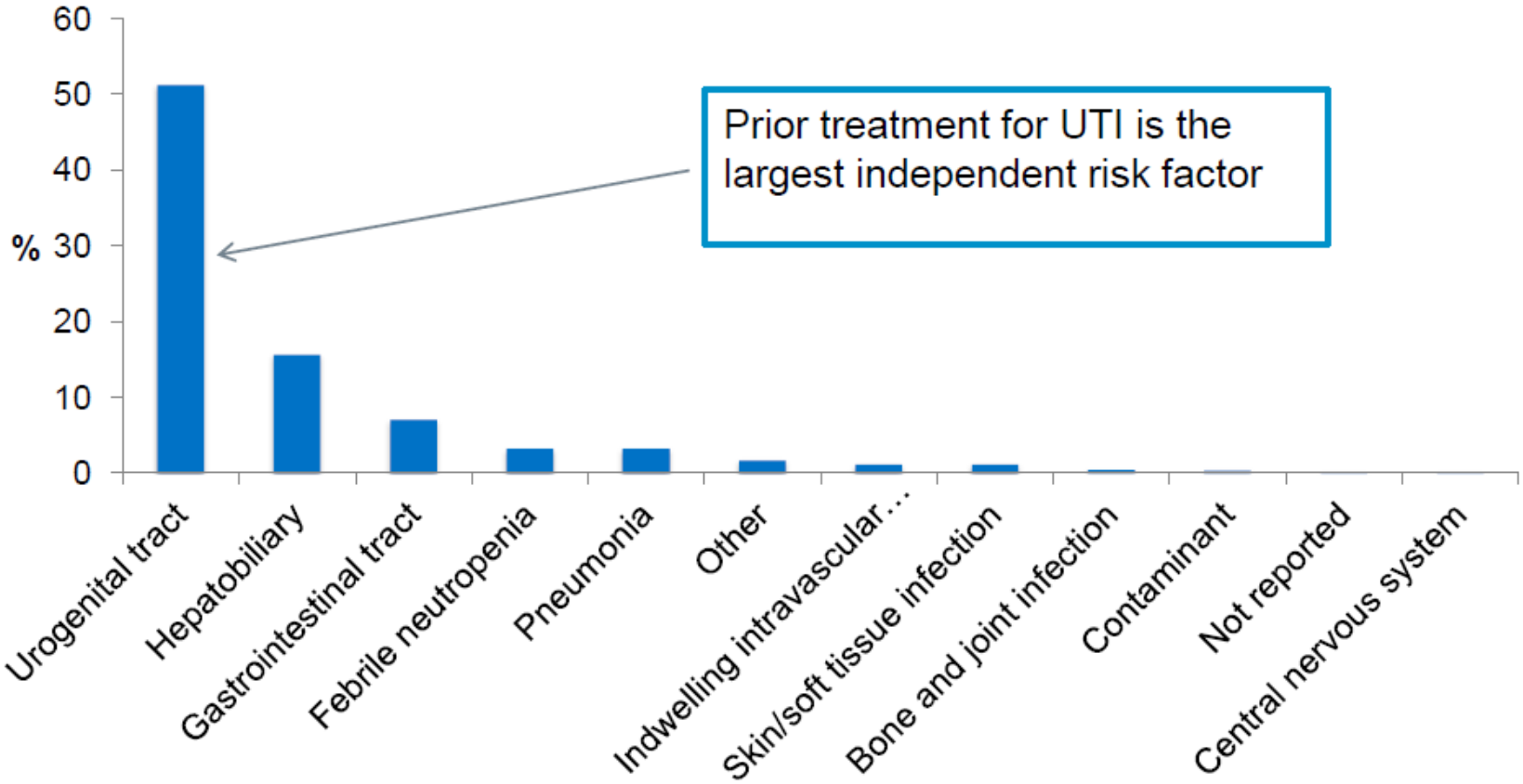
Source of *E.coli* Bloodstream Infections



15% unknown

Abernethy JHI 2017

Key healthcare events

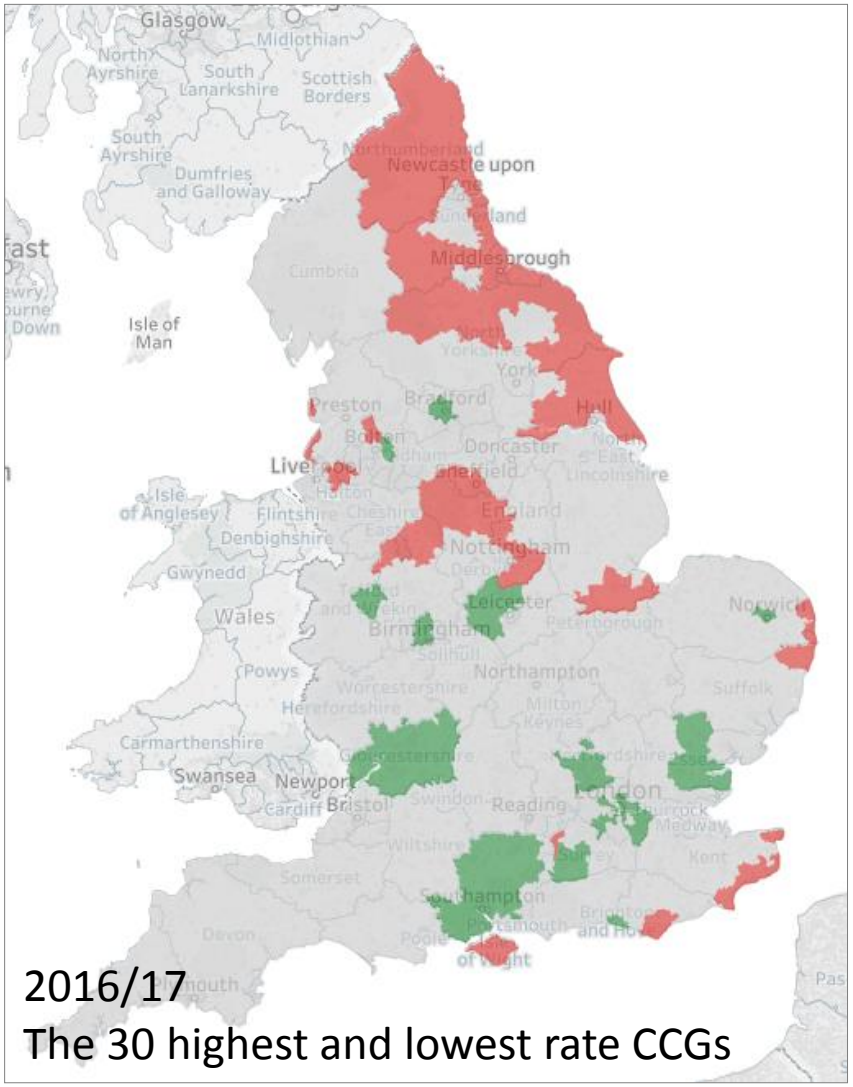
Key events related to BSI	%
Antibiotics (4 weeks)	32.4
Urinary catheter in situ, inserted, removed, manipulated (7 days)	21.0
Other devices in situ or removed (4 weeks)	7.3
Other procedures (4 weeks)	12.4

Healthcare associated GNBSI

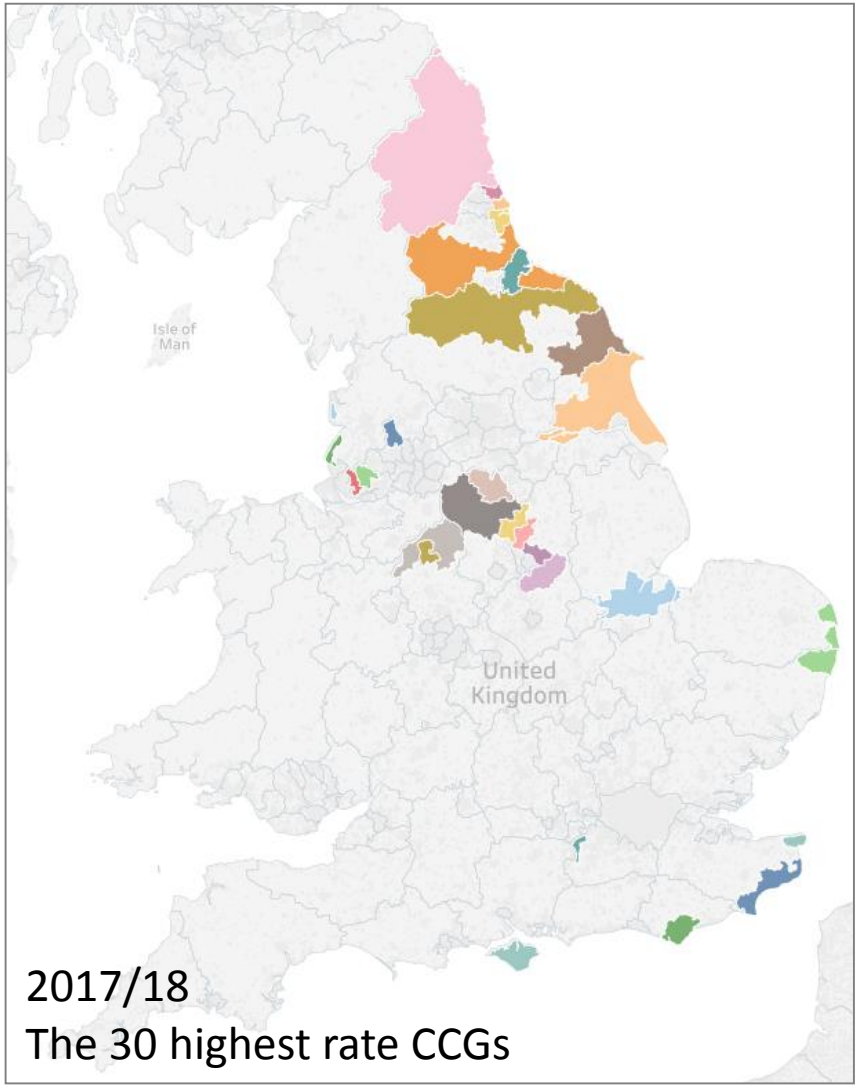
This is not an exhaustive list but should be used as a basis to classify Gram-negative BSIs as healthcare associated:

- **indwelling vascular access devices (insertion, in situ, or removal)**
- **urinary catheterisation (insertion, in situ with or without manipulation, or removal)**
- **other devices (insertion, in situ with or without manipulation, or removal)**
- **invasive procedures (e.g. ERCP, prostate biopsy, surgery including, but not restricted to, gastrointestinal tract surgery)**
- **neutropenia (<500μ/L at time of bacteraemia)**
- **antimicrobial therapy within the previous 28 days**
- **hospital admission within the previous 28 days.**

E.coli BSI geographical split



2016/17
The 30 highest and lowest rate CCGs



2017/18
The 30 highest rate CCGs

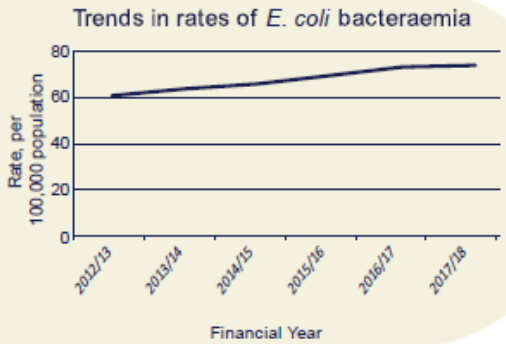
Public Health England

Protecting and improving the nation's health

E. coli bacteraemia England 2017/18

Overall rate

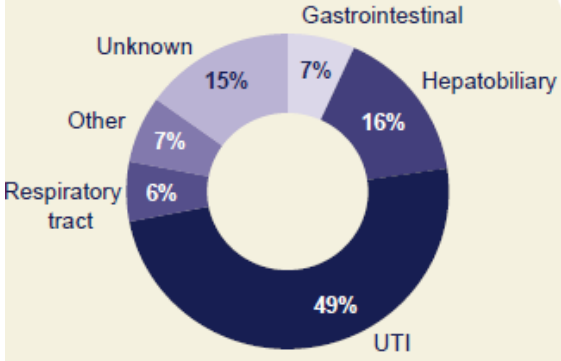
74 people out of every 100,000 will acquire an E.*coli* bacteraemia



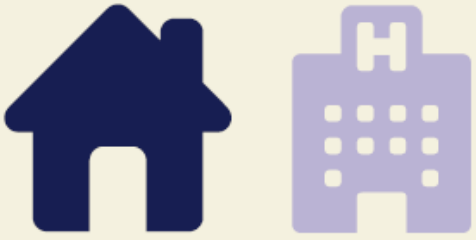
Risk greater among elderly

Adult male rate	Adult female rate	Elderly male rate	Elderly female rate
53 adult males out of every 100,000 (age 45-64)	54 adult females out of every 100,000 (age 45-64)	901 elderly males out of every 100,000 (age ≥85)	616 elderly females out of every 100,000 (age ≥85)

Most common source of infection



Most cases are community onset



74% <2 days

26% ≥2 days

For full report, please see https://www.gov.uk/government/statistics/mrsa-mssa-and-e-coli-bacteraemia-and-c-difficile-infection-annual-epidemiological-commentary

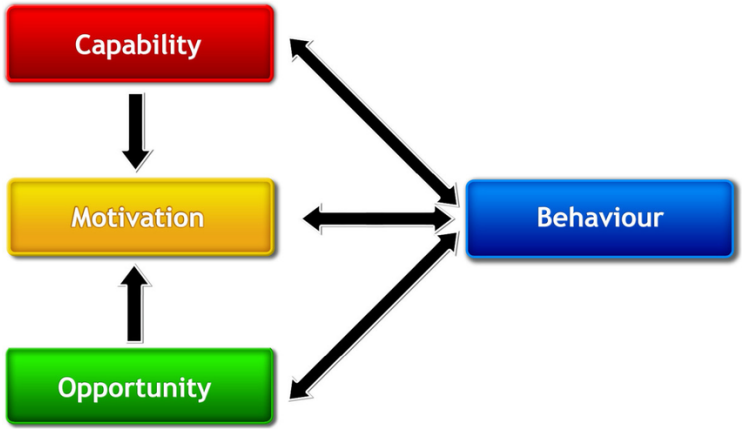
Suggested actions to reduce *E.coli* BSIs 2017:

CCG to lead a health economy approach to reducing *E. coli* BSI, and ensure:

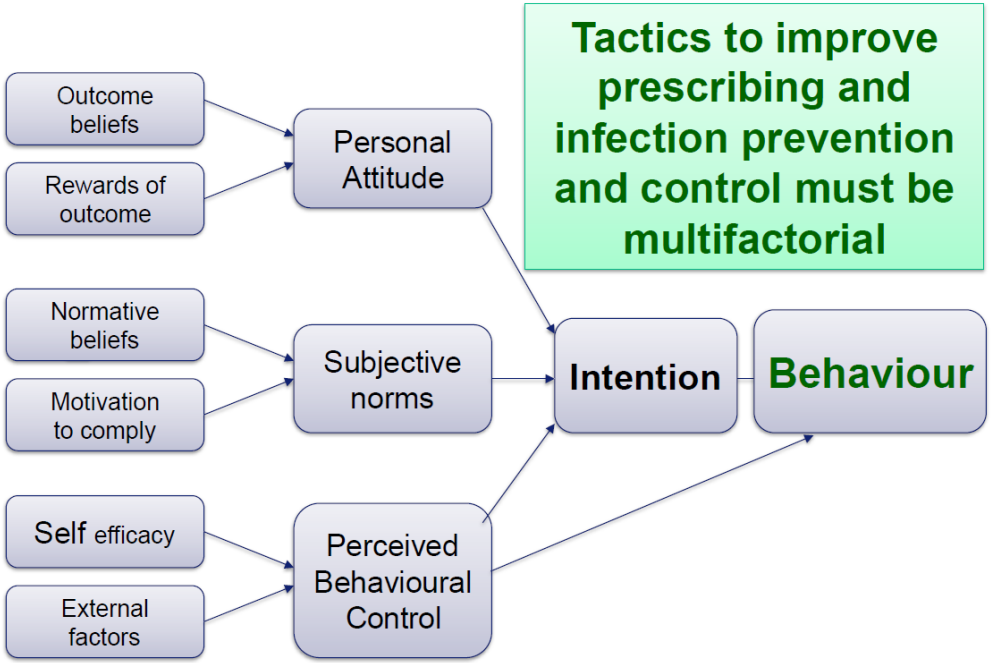
- All partner organisations **review their approach** to reducing *E. coli* BSIs
- **Understand your own local data**
- Patients with *E. coli* BSIs are reviewed to determine whether there are **common themes** in cases which could help you identify priority areas for action
- An **improvement plan** is developed based on these assessments
- Progress is reviewed by **monitoring local surveillance data**, comparing findings with subsequent case reviews.

Developing national actions

- Delivery of health and social care is complex
- interventions that may suit one area of England will not automatically translate to another.
- We know that increasing knowledge and awareness of rising rates of GNBSIs is rarely enough to trigger successful and sustained behavioural change.
- Barriers to behaviour change are complex and include such as competing motivations, lack of resources, prevailing practices and social
- Designing resources with those that will use them in practice makes them more valuable, effective and more likely to be utilised in the long term.

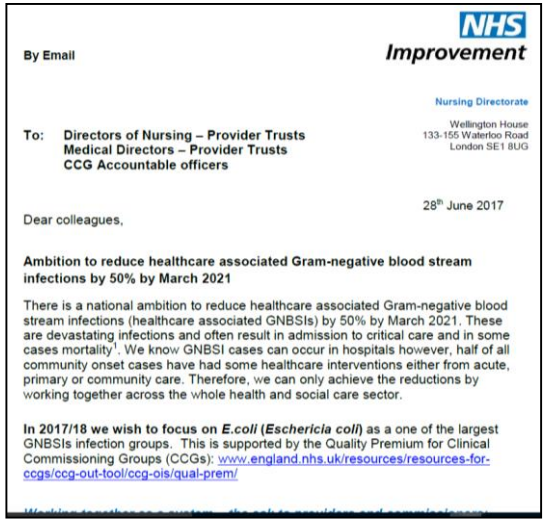


Shaw, K. *et al* (2019) A unique approach to the development of infection prevention and control resources for front-line health care workers



National GNBSI timeline

- **November 2016**
  - SoS launches GNBSI ambition - Lord O'Neil AMR report
  - Ruth announced as national DIPC
- **2017**
  - Quality Premium and CQUIN announced
  - GNBSI Improvement resource published
  - System letter re CCG-led action plans
  - Economic modelling tool published
  - Secretary of State – One Year On event
- **2018**
  - National webinar on early successes
  - UTI collaboratives
  - DIPC executive development courses
  - Masterclass for board executives event
  - STP DIPC pilot sites developing
  - Support offer to CCGs / STPs and Cancer Centres
- **2019 Publications**
  - Standard infection control precautions: national hand hygiene and PPE policy
  - Urinary catheter tools
  - Gram-negative BSI system overview tool
  - NICE / PHE Antimicrobial prescribing guidelines
  - Interventions targeting the sources of Gram-negative bloodstream infections



By Email

NHS Improvement

Nursing Directorate

Wellington House
133-155 Waterloo Road
London SE1 8UG

To: Directors of Nursing – Provider Trusts
Medical Directors – Provider Trusts
CCG Accountable officers

28th June 2017

Dear colleagues,

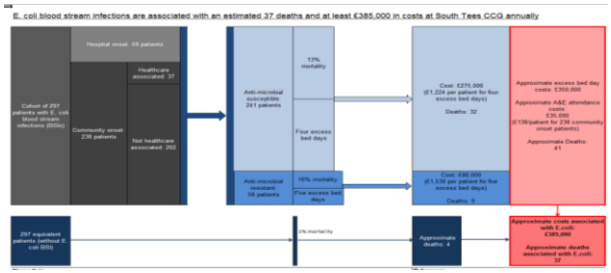
Ambition to reduce healthcare associated Gram-negative blood stream infections by 50% by March 2021

There is a national ambition to reduce healthcare associated Gram-negative blood stream infections (healthcare associated GNBSIs) by 50% by March 2021. These are devastating infections and often result in admission to critical care and in some cases mortality[1]. We know GNBSI cases can occur in hospitals however, half of all community onset cases have had some healthcare interventions either from acute, primary or community care. Therefore, we can only achieve the reductions by working together across the whole health and social care sector.

In 2017/18 we wish to focus on *E.coli* (*Eschericia coli*) as a one of the largest GNBSIs infection groups. This is supported by the Quality Premium for Clinical Commissioning Groups (CCGs): www.england.nhs.uk/resources/resources-for-ccgs/ccg-out-tool/ccg-ois/qual-prem/

Preventing healthcare associated Gram-negative bloodstream infections: an improvement resource

May 2017



Interventions

NHS

Taking ANTIBIOTICS when you don't need them puts you and your family at risk

Keep Antibiotics Working

Guidance

Health matters: preventing infections and reducing antimicrobial resistance

Published 13 November 2017

https://www.gov.uk/government/publications/health-matters-preventing-infections-and-reducing-amr/health-matters-preventing-infections-and-reducing-antimicrobial-resistance

Standard precautions: national hand hygiene / PPE policy

IPC themes from Well Led

Care Quality Commission

Preventing infection to tackle AMR

Antimicrobial resistance (AMR) is a major threat to modern healthcare

AMR means bacteria developing the ability to survive exposure to antibiotics which are designed to kill them or stop their growth. If we don't urgently address the problem, we may soon be unable to effectively treat common infections.

Infection prevention is key as preventing and controlling infections will lead to fewer antimicrobial drugs being used, meaning less risk of bacteria developing resistance.

Scale of the problem

- AMR is estimated to cause 700,000 deaths globally each year. This could rise to 10 million deaths by 2050 if we fail to act
- 1 in 3 people in England take at least one course of antibiotics each year
- By 2030, the global human consumption of antibiotics is forecast to rise by more than 30%, which will lead to increased resistance

Every infection prevented helps to combat AMR, so health and social care professionals have a critical role

How you can help

- Ensure your hands, instruments, and working environment are clean
- Ensure high standards of care for invasive devices and procedures
- Encourage patients to get vaccinated against preventable illnesses like flu and measles – and ensure you do the same
- Only prescribe and dispense antibiotics when they are needed. Take appropriate specimens to identify the causative organism and tailor antimicrobials based on the results
- Talk to people about when antibiotics should be used, how to take them correctly, and the importance of not hoarding or sharing them
- Report antibiotic-resistant infections to local clinicians
- Don't be afraid to speak up to question the use of invasive devices, procedures or treatments if they are no longer needed

We can help tackle this public health threat by working together to prevent infection

www.ips.uk.net

ips Infection Prevention Society

Minimising infection is a key part of the Government's approach to tackling AMR – for more information, please visit:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/773065/uk-20-year-vision-for-antimicrobial-resistance.pdf
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/773130/uk-amr-5-year-national-action-plan.pdf

Cough (acute) Published: February 2019	Chronic obstructive pulmonary disease (acute exacerbation) Published: December 2018	Urinary tract infection (catheter-associated) Published: November 2018
Lower UTI Published: October 2018	Recurrent UTI Published: October 2018	Prostatitis (acute) Published: October 2018
Pyelonephritis (acute) Published: October 2018	Otitis media (acute) Published: March 2018	Sore throat (acute) Published: January 2018
Sinusitis (acute) Published: October 2017		

Home > Resources > Interventions targeting the sources of Gra...

Interventions targeting the sources of Gram-negative bloodstream infections

Evidence and guidelines for interventions that specifically target the most common sources of infection relating to Gram-negative bloodstream infections (GNBSI).

Theme: Quality improvement
Topic: Quality
Resource type: Research and analysis
Source: NHS improvement
Published on: 23 January 2019

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Contents

Implementation

I-Hydrate resources

Welcome to our I-Hydrate resources page, where you'll find our downloadable resource pack and supporting videos.

Download the resource pack

Watch our videos

The resource pack

The I-Hydrate resource pack is broken down into four sections followed by a series of appendices.

Section 1: Hydration and the care home environment

This section explores dehydration and why older people are particularly vulnerable to this problem. We consider the care home environment itself and how the structure of care may adversely affect the amount of fluid residents drink.

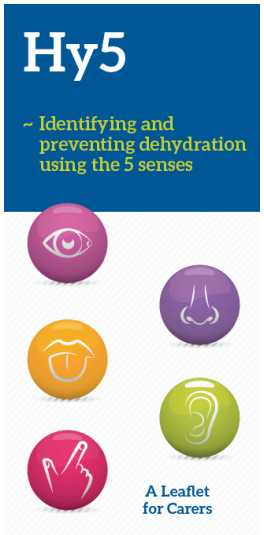
Section 2: Improving practice and Plan-Do-Study-Act cycles

We look at factors which need to be considered when planning changes in how care is delivered, and some useful methods for introducing and testing new approaches.

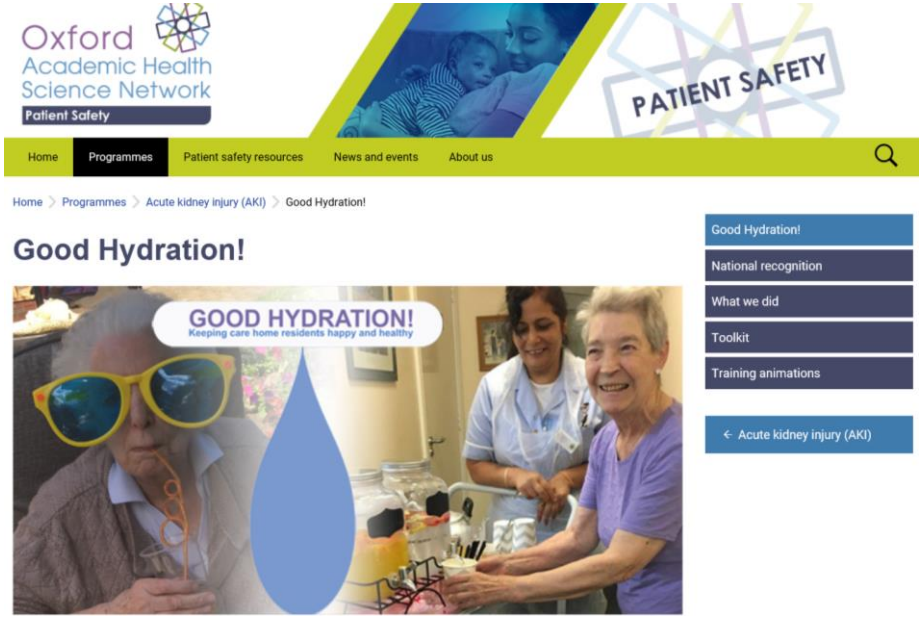
Section 3: Strategies to improve hydration

This section describes strategies which were developed during the I-Hydrate project. It explains the aim of each strategy, what resources are needed to carry them out and some of the factors that are important to consider in getting the strategies to work in practice.

Section 4: Training your staff



TARGET



2019/20 CQUIN

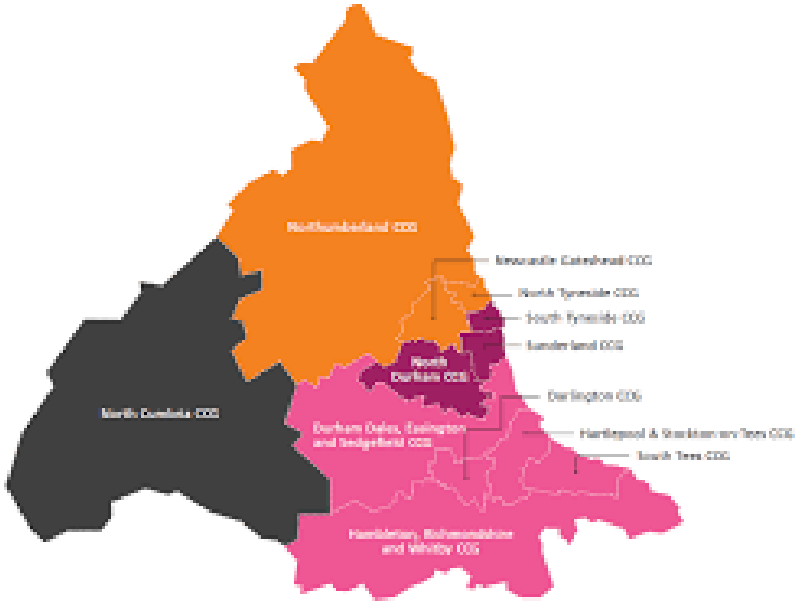
NHS

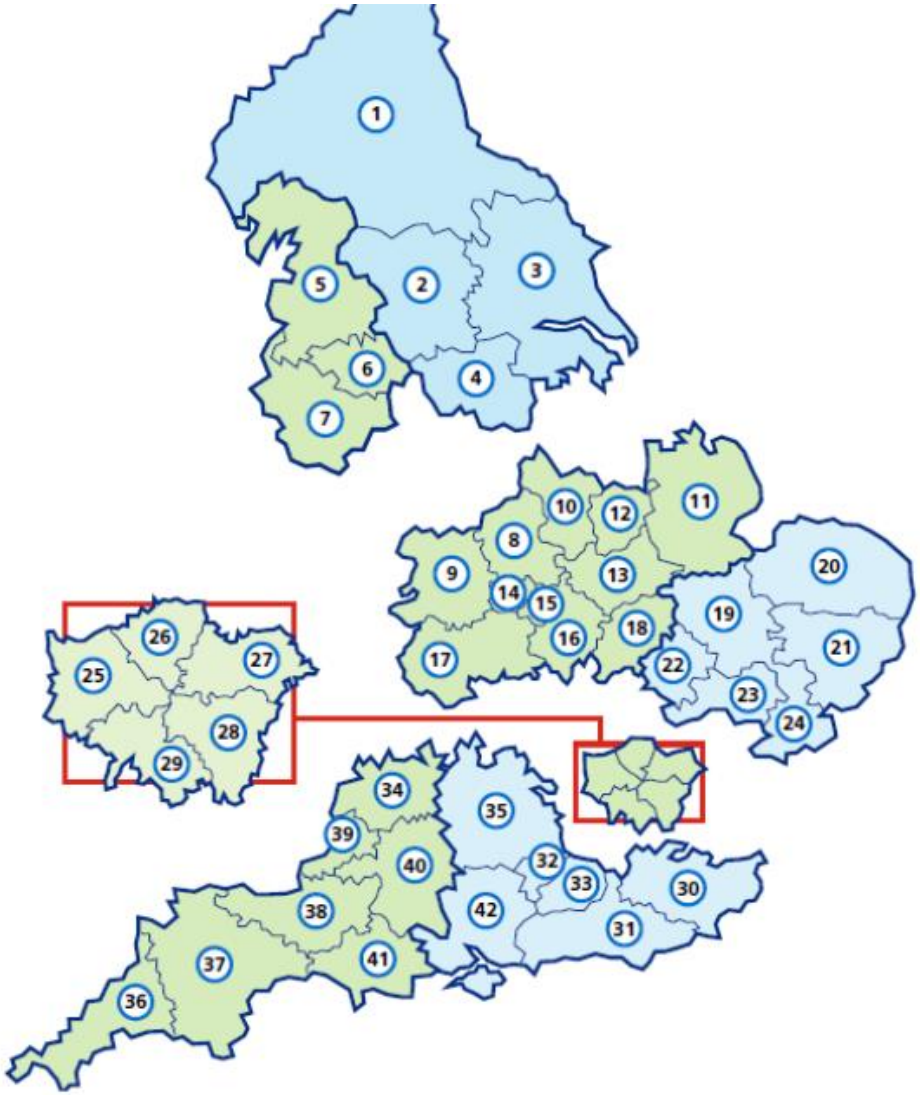
Prevention of Ill Health	Mental Health	Patient Safety	Best Practice Pathways
• Antimicrobial Resistance – Lower Urinary Tract Infections in Older People & Antibiotic Prophylaxis in Colorectal Surgery	• Improved Discharge Follow Up	• Three High Impact Actions to Prevent Hospital Falls	• Stroke 6 Month Reviews
• Staff Flu Vaccinations	• Improved Data Quality and Reporting – Data Quality Maturity Index & Interventions	• Community Inserted PICC Lines Secured Using a SecurAcath Device	• Ambulance Patient Data at Scene – Assurance & Demonstration
• Alcohol and Tobacco – Screening & Brief Advice	• IAPT – Use of Anxiety Disorder Specific Measures		• Same Day Emergency Care – Pulmonary Embolus/ Tachycardia/ Community Acquired Pneumonia

Chief Medical Officer annual report 2018

- ‘Today, up to 50,000 lives are lost each year to antibiotic-resistant infections in Europe and the US. Globally, at least 700,000 die each year of drug resistance in illnesses such as bacterial infections, malaria, HIV/AIDS or tuberculosis.
- ‘estimates (are) that by 2050, 10 million lives a year are at risk along with a cumulative economic loss of US $100 trillion worldwide. (O’Neill)
- *Drug-Resistant Infections: A Threat to Our Economic Future (*World Bank)*,*
  - drug-resistant infections have the potential to cause economic damage similar to – and likely worse than – that inflicted by the 2008 financial crisis, with the worst impact on the poorest countries and people.
  - In its worst-case scenario, the world would lose 3.8 per cent of its annual gross domestic product (GDP) by 2050.
  - low-income countries would experience larger drops in economic growth than wealthy countries, so global poverty and economic inequality would increase.
- ‘…we have a relative degree of certainty that these catastrophic outcomes will occur without radical interventions or motivations’

STP / ICS role?


Northumberland CCG
Newcastle Gateshead CCG
North Tyneside CCG
South Tyneside CCG
Sunderland CCG
North Durham CCG
Darlington CCG
Durham Dales, Easington and Sedgefield CCG
Hartlepool & Stockton-on-Tees CCG
South Tees CCG
North Cumbria CCG
Hambleton, Richmondshire and Whitby CCG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The UK's vision for AMR by 2040 and five-year national action plan - DHSC

By 2040, our vision is of a world in which antimicrobial resistance (AMR) is effectively contained, controlled and mitigated.

Measuring Success in the first five years

MEASURING SUCCESS

Target: to **reduce** the incidence of a specified set of drug **resistant infections** in humans in the UK by 10% by 2025; and halve the number of healthcare associated Gram-negative blood stream infections.

MEASURING SUCCESS

Target: to **reduce** UK antimicrobial **use in humans** by 15% by 2024, including:

- a 25% reduction in antibiotic use in the community from the 2013 baseline.
- a 10% reduction in use of 'reserve' and 'watch' antibiotics in hospitals from the 2017 baseline.

MEASURING SUCCESS

Target: to **reduce** UK antibiotic **use in food-producing animals** by 25% between 2016 and 2020; and define new objectives for individual animal sectors by 2021.

MEASURING SUCCESS

Target: to be able to report on the percentage of prescriptions supported by **use of a diagnostics** test or decision support tool by 2024, with improvement targets set by 2025.

Department of Health & Social Care

Summary

- Develop and build on systemic delivery of AMS and IPC.
- Embed ‘Golden threads’ strategically and operationally
- Understand quality improvement and behavioural science
- Do better what we know works, esp. fundamentals
- Share it
- Identify gaps – hepatobiliary, HAP, CAP
- Continue to horizon scan