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Reducing GNBSIs & Inappropriate Antibiotic Prescribing in at Risk Groups: A Whole Health Economy Approach to the NHS England Quality Premium

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Why are we talking about this?

WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Insight Report

The Global Risks Report 2016

11th Edition

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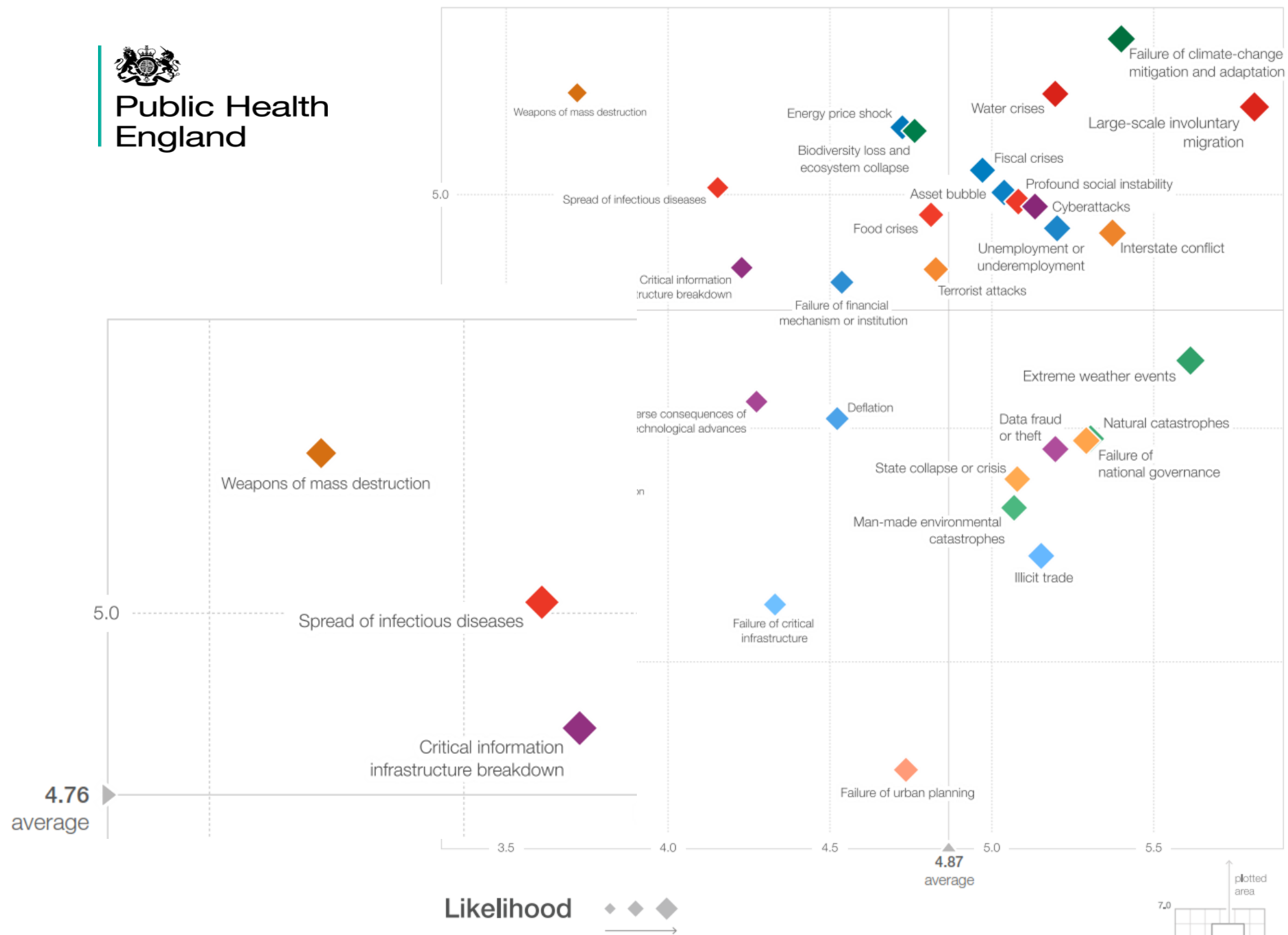

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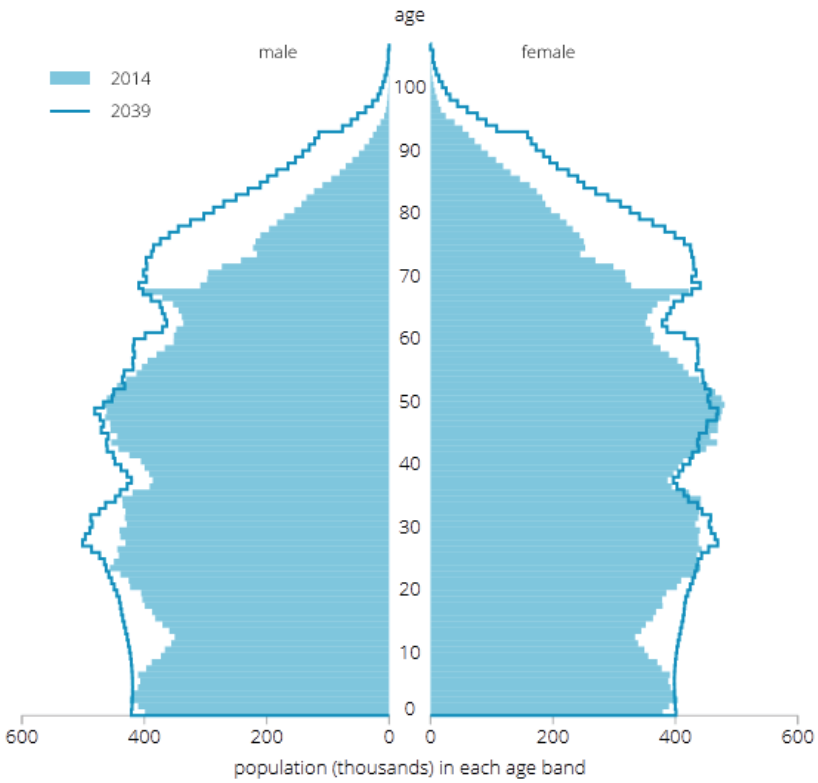
How is the population changing?

The UK population is projected to increase by 9.7m over the next 25 years (64.6m in 2014 to 74.3m in 2039)

The UK population is projected to reach 70m by mid-2027

Average age rising from 40.0 years in 2014 to 40.9 years in mid-2024 and 42.9 by mid-2039

By mid-2039, more than 1 in 12 of the population is projected to be aged 80 or over



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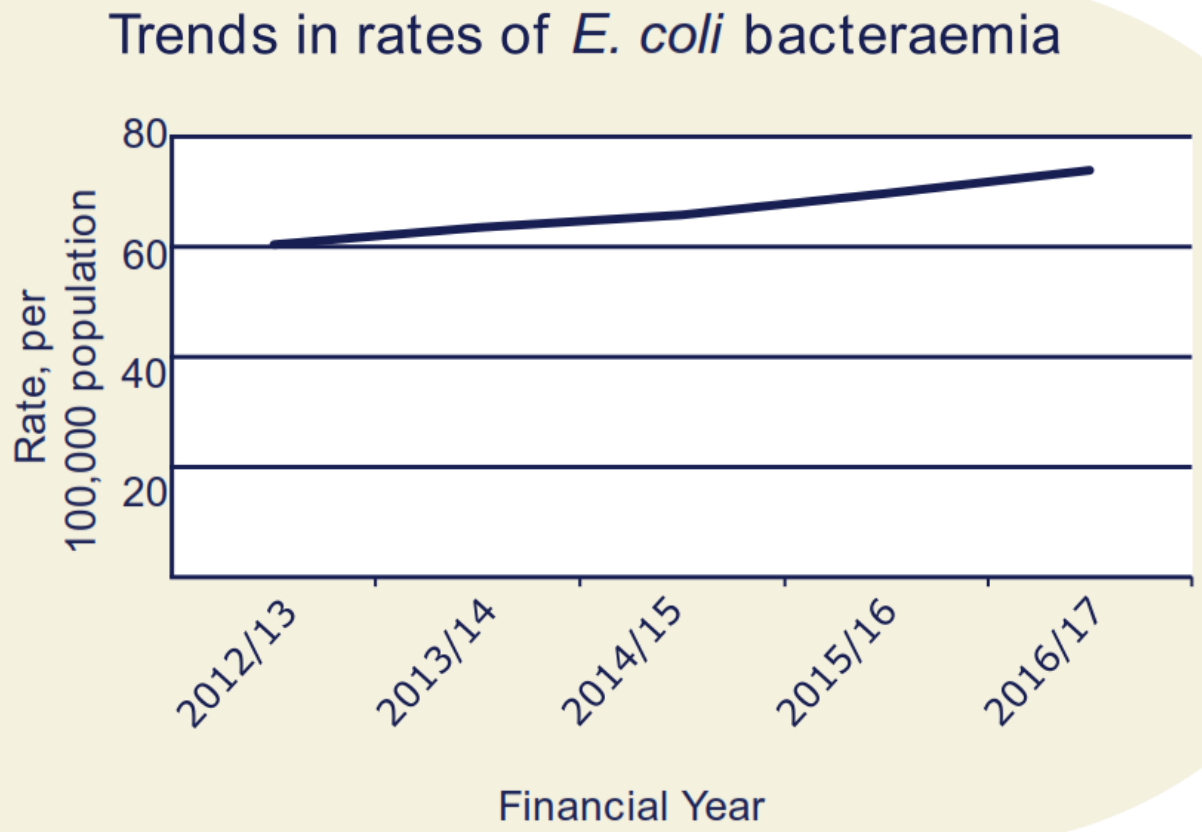
E. coli infections

Overall rate

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



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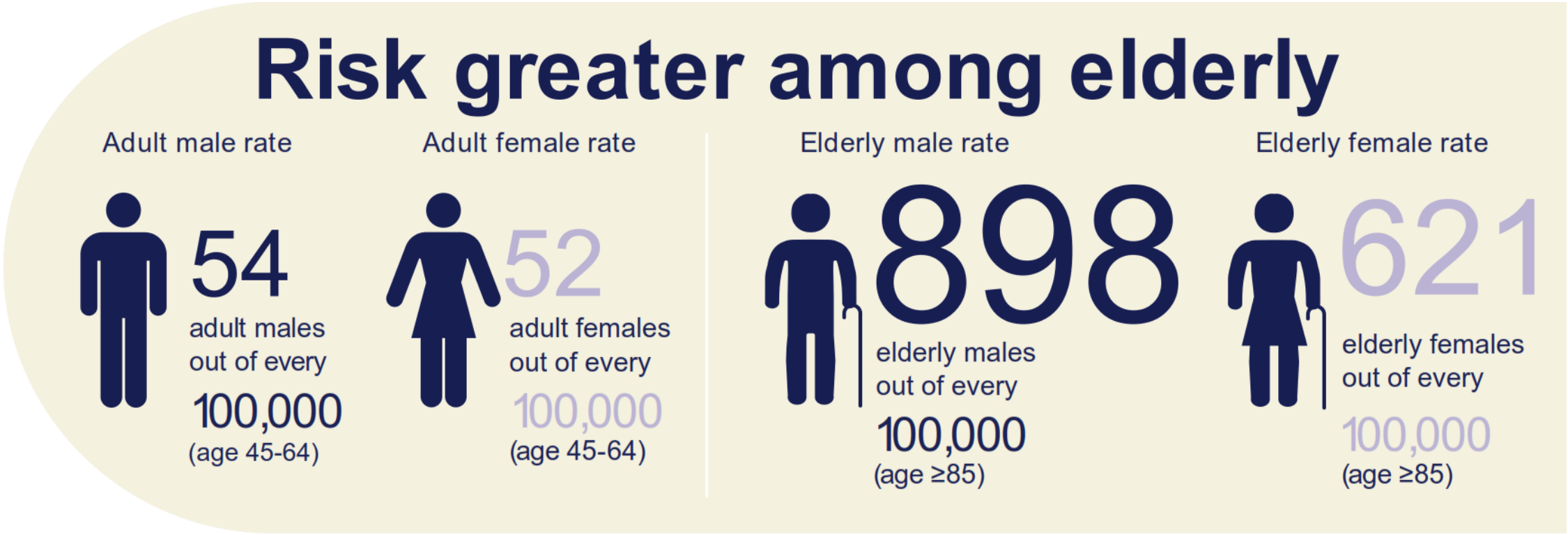
E. coli infections



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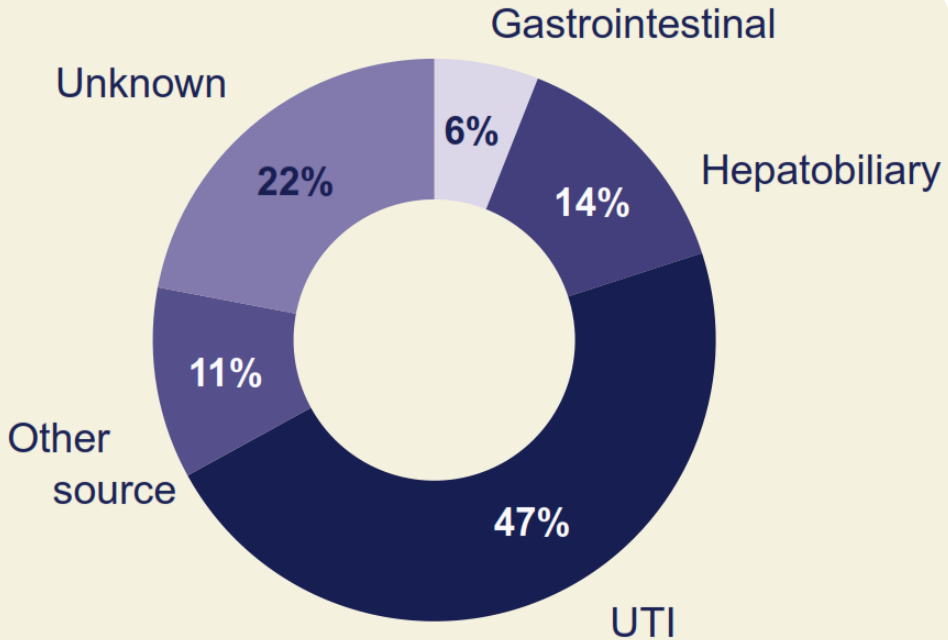
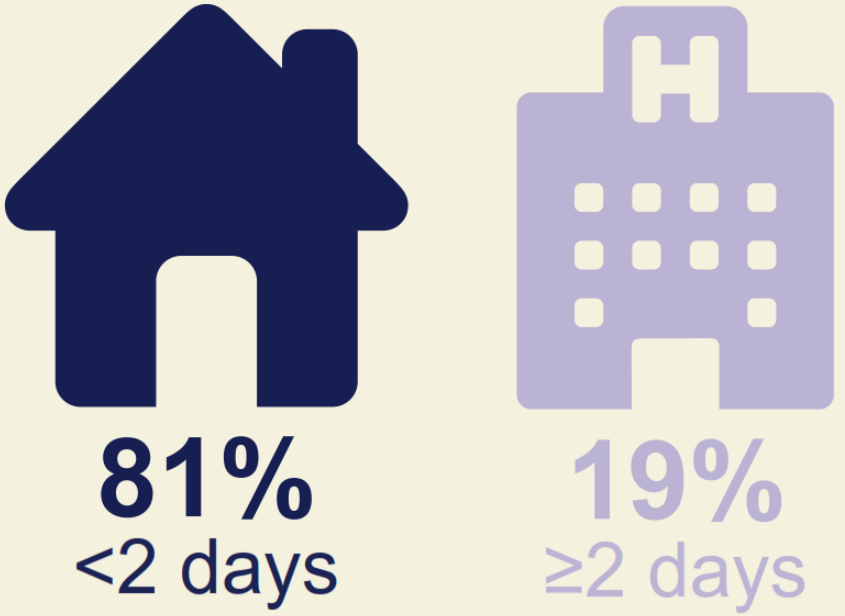
E. coli infections

Most common source of infection



Most cases are community onset



…independent Care Quality Commission (CQC) inspections focusing on infection prevention based on E. coli rates in hospitals and in the community, and taking action against poor performers….

…displaying E. coli rates on wards, making them visible to patients and visitors in the same way that MRSA and C. difficile are currently…

News story

Reducing infections in the NHS

From: Department of Health
First published: 10 November 2016
Part of: Patient safety

Plans to prevent hospital infections include more money for hospitals who reduce infection rates and publishing E. coli rates by local area.

Health Secretary Jeremy Hunt has launched new plans to reduce infections in the NHS. He announced government plans to halve the number of gram-negative bloodstream infections by 2020 at an infection control summit.

E. coli infections – which represent 65% of what are called gram-negative infections – killed more than 5,500 NHS patients last year and are set to cost the NHS £2.3 billion by 2018. There is also large variation in hospital infection rates, with the worst performers having more than 5 times the number of cases than the best performing hospitals.

Infection rates can be cut with better hygiene and improved patient care in hospitals, surgeries and care homes, such as ensuring staff, patients and visitors regularly wash their hands. People using insertion devices such as catheters, which are often used following surgery, can develop infections like E. coli if they are not inserted properly, left in too long or if patients are not properly hydrated and going to the toilet regularly.

These new plans build on the progress made in infection control since 2010 – the number of MRSA cases has been reduced by 57% and C. difficile by 45%.

Health Secretary Jeremy Hunt said,

" The NHS can rightly be proud that in the last 6 years we've reduced the number of MRSA cases by 57% and C. difficile by 45%. These aren't

*….A third of E. coli infections are now resistant to antibiotics and those who are infected with a resistant strain are twice as likely to die ….. E. coli infections have increased by a fifth in the last 5 years. Targeting **preventable** infections like E. coli helps to make care safer for patients….*

…the NHS publishing staff hand hygiene indicators for the first time…

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National incentive schemes

2015-2017

Quality Premium for improved antibiotic prescribing in primary care 2015-16 and 2016-17

Sepsis **CQUIN** 2015-16 & 2016-17 - systematic screening for sepsis and timely treatment

AMR **CQUIN** 2016-17 - Reduced antibiotic consumption in acute trusts & improved stewardship review 2016-17

2017-2109

CQUIN 2017-19 - Reducing the impact of serious infection

Quality Premium 2017-19 - Reducing Gram Negative Bloodstream Infections (GNBSIs) and inappropriate antibiotic prescribing in at risk groups

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The GNBSI QP consists of three parts

Part a) reducing gram negative blood stream infections (BSI) across the whole health economy (worth 45% of payment)

Part b) reduction of inappropriate antibiotic prescribing for urinary tract infections (UTI) in primary care (worth 45% of payment)

Part c) sustained reduction of inappropriate prescribing in primary care (worth 10% of payment)

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How can this be delivered?

Understand the scale of the problem locally

Data mining of laboratory data looking at antimicrobial susceptibility

Engage with key stakeholders:

Clinicians from primary and secondary care

Pharmacists

Healthcare epidemiologists

Laboratory scientists

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The cause of the increase in *E.coli* bacteraemia is unknown

A three-month enhanced sentinel surveillance study involving 35 National Health Service hospitals was undertaken in the winter of 2012/13

1731 cases of *E. coli* bacteraemia were included[1]

Urogenital tract was the most frequently reported source of infection (51.2% of cases)

Half of all patients had previous healthcare exposure including antimicrobial therapy in the month prior to the bacteraemia

One third of these patients reported having urinary catheters

Previous healthcare exposure was associated with higher proportion of antibiotic non-susceptibility in blood culture isolates

[1]http://dx.doi.org/10.1016/j.jhin.2016.12.008

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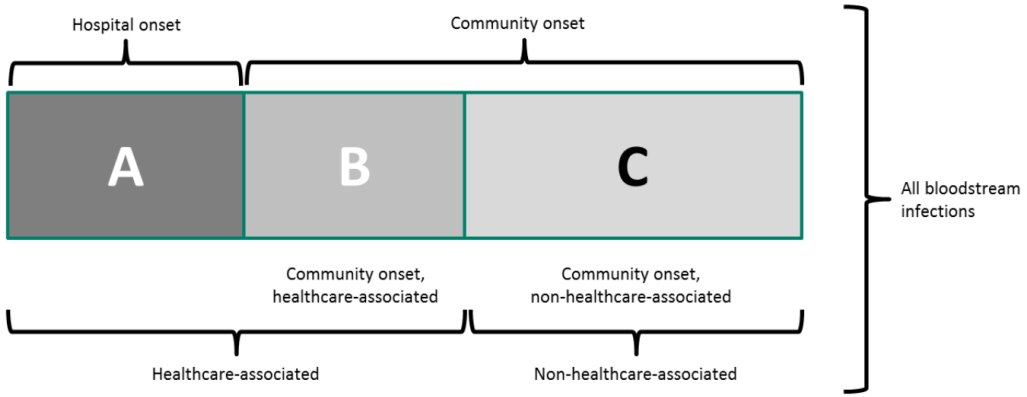
NHS Improvement

Guidance on the definition of healthcare associated Gram-negative bloodstream infections

July 2017

Figure 1. Definitions of different categories of bloodstream infections



"A healthcare associated Gram-negative BSI will be a laboratory-confirmed positive blood culture for a Gram-negative pathogen in patients who had received healthcare in either the community or hospital in the previous 28 days."

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E. coli bacteraemia: antibiotic resistance

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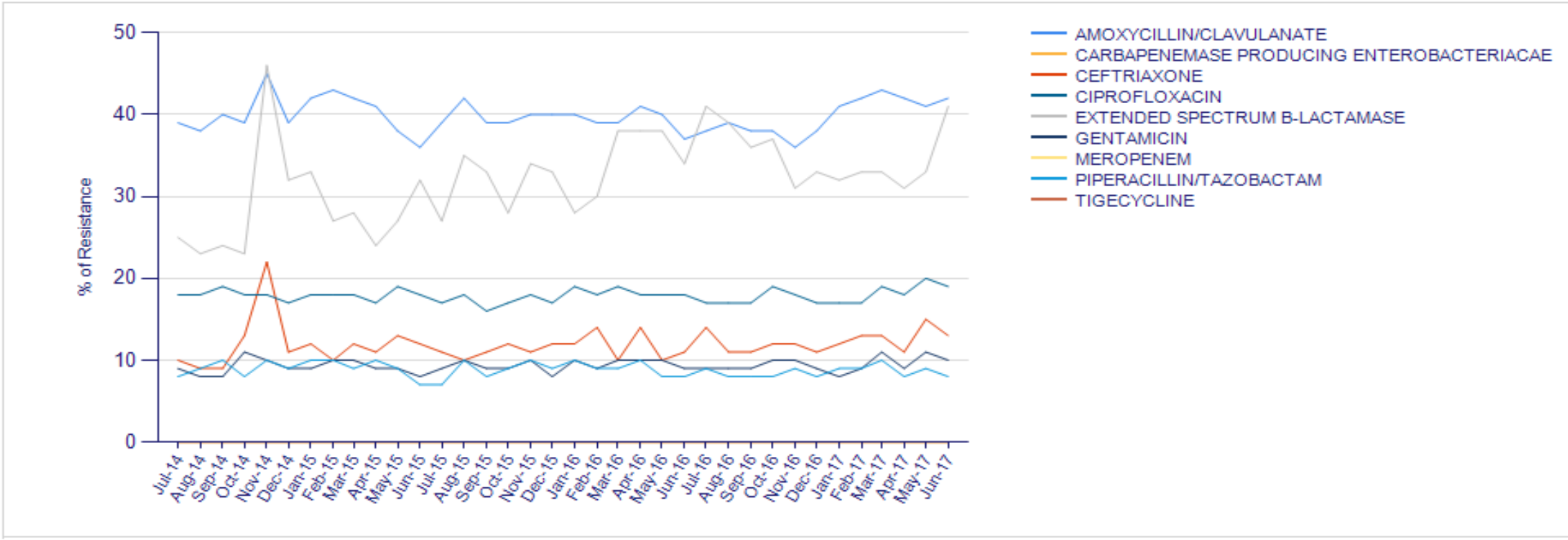
Report Title: R9 Resistance Trends **User:** SGSS\abid.hussain_3735 **Date:** 11/07/2017 13:34:18

Resistance Trends Report by ESCHERICHIA COLI Nationally



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The *E. coli* journey at Heart of England Foundation Trust

Development of high impact actions group

Rationalise equipment

Implement urinary catheter care plan

Catheter passport

"The catheter passport helped me to get involved in the care of my catheter."

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Source of infection for pre/post 48 hour *E. coli* bacteraemia

Source of infection	Pre 135 patients	Post 21 patients
Urinary	85 patients 63%	8 patients 38%
Genital	0 patients 0%	1 patient 5%
Gastrointestinal	9 patients 7%	4 patients 19%
Hepato-bilary	21 patients 15.5%	2 patients 9 %
Respiratory	11 patients 14 %	0 patients 0 %
Skin	0 patients 0%	0 patients 0%
Nervous system	0 patients 0%	0 patients 0%
Bone and joint	0 patients 0%	0 patients 0%
Intravascular device	1 patient 0.75%	1 patient 5%
Unknown source	6 patients 8 %	5 patients 24%
Other source	2 patients 2.7%	0 patients 0%

Other = prostate abscess /PICC line /haemorroids

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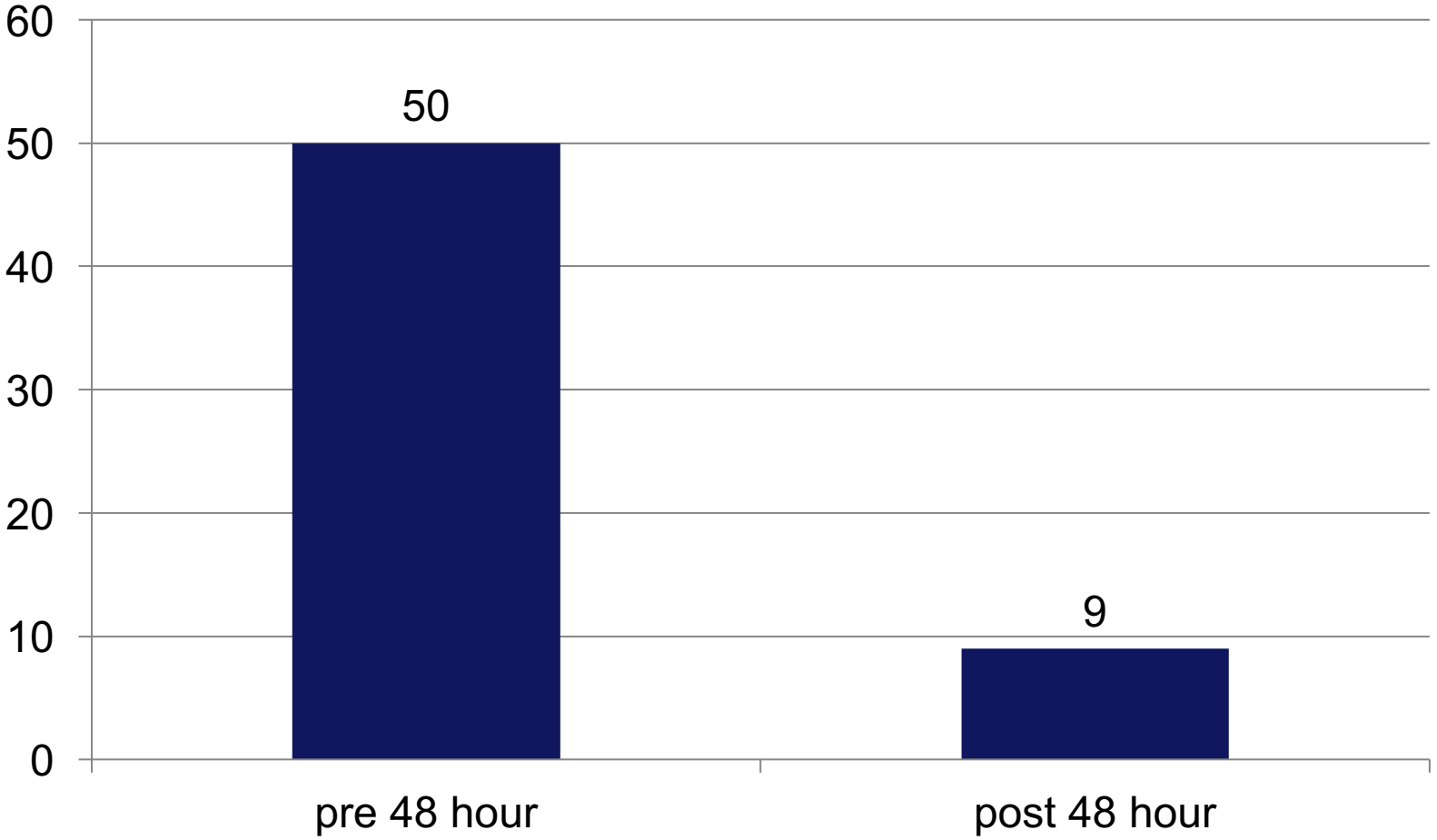
E. coli bacteraemia cases
Possible preventable features n=59



Building healthier lives

Heart of England NHS Foundation Trust

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E.coli bacteraemia
Cases with possible preventable features

Source	Pre 50 patients	Post 9 patients
Urinary	35 patients total - 8 with urinary catheter - 2 with nephrostomy	4 patients total - 1 with urinary catheter
Unknown source	3 patients	2 patients
Intravascular	2 patients	
Hepapatobilary	5 patients	1 patient
Gastrointestinal		2 patients
Respiratory	4 patients	
Other source	1 patient	

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Possible preventable features

Recent urological surgery i.e TURP

Catheter associated sepsis

Previous E. coli isolated (any sample site)

Short/incomplete/wrong antibiotic treatment for UTI by GP

Pyelonephritis

Previous hospital admission within 3 months

Recent surgery

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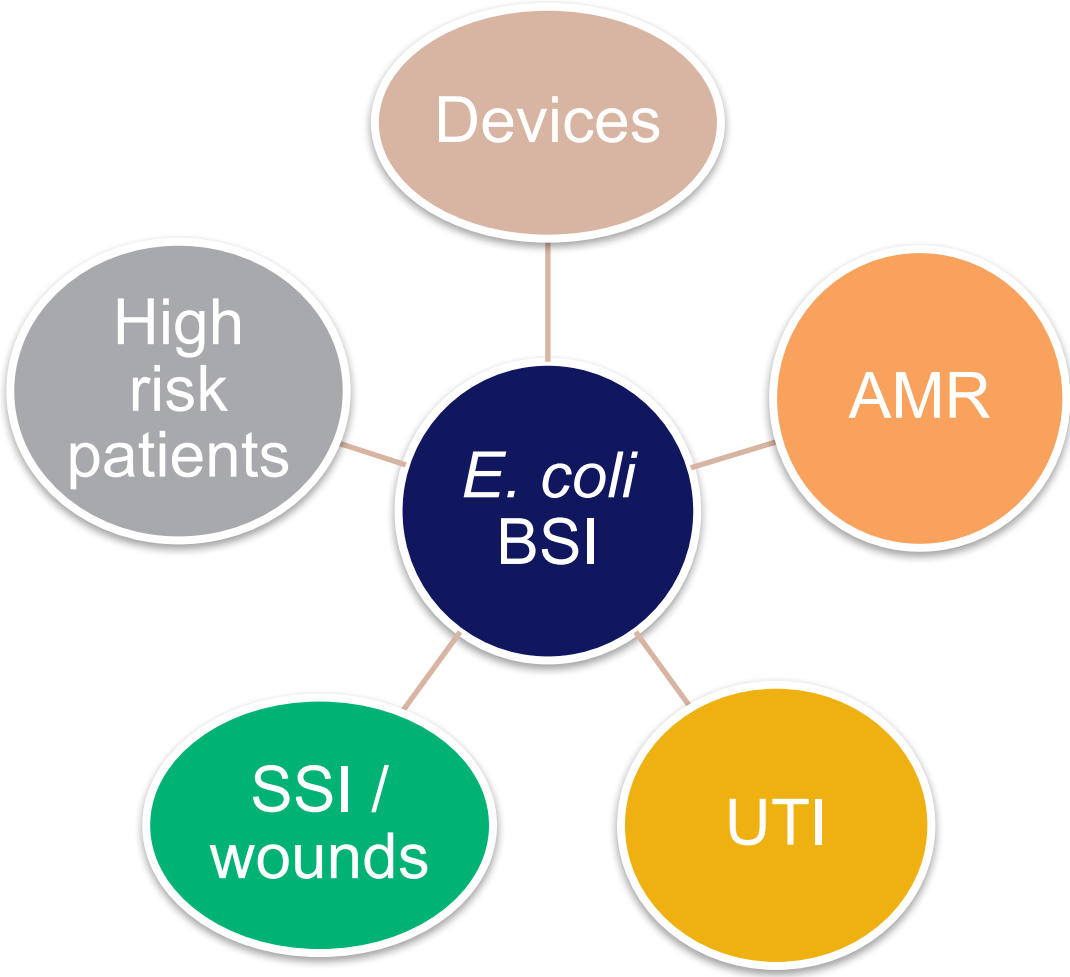
Understanding and preventing *E. coli* bacteraemia



Building **healthier** lives

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NHS Foundation Trust

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Onward Journey

Continue mandatory reporting

Detailed RCA post 48hrs

Partnership working CCG, Community medicine management team

Clinical partners-surgeons

Promote Antimicrobial Stewardship

Modify database

Continue urinary catheter work- continence team

National guidelines

Consider other factors

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Summer peaks in *E. coli* bacteraemia

? Related to hydration in elderly patients

Cognitive issues related to failure to drink/eat. In our audit 14 % of patients had mental capacity issues

Reluctance to drink because to continence issues, provision of pads?

Summer Peaks in the Incidences of Gram-Negative Bacterial Infection Among Hospitalized Patients Infect Control Hosp Epidemiol. 2008 Dec;29(12):1124-31

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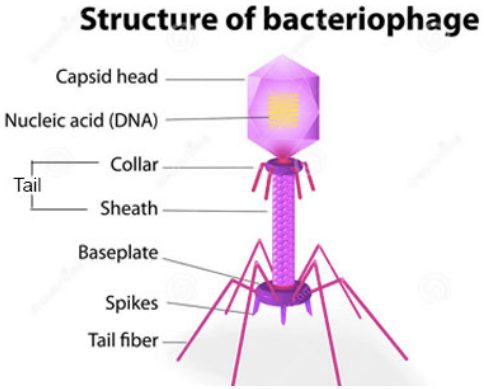
What does the future hold?

- Prevention beyond antimicrobial activity
- Xyloglicam, propolis and hibuscus extract[1]
- Maintained *E. coli* integrity
- No antibacterial properties
- Prevent adherence of uropathogenic *E. coli* on intestinal and uroepithelial cells.

- Bacteriophage: viruses that infect and replicate within bacteria
- Replication results in bacterial cell lysis
- Commercial phage cocktails demonstrate lytic activity against clinical isolates of *E. coli* and *K. pnuemoniae*[2]
- Combat increasing antimicrobial resistance



[1]Fraile B *et al. Future Microbiol* 2017 (epub)
[2]Sybesma W *et al. Frontiers Microbiol* 2016(7):465