Implementing the UK Antimicrobial Resistance Strategy in the NHS

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Key messages:

Antimicrobial resistance is a global problem with a significant impact on public health

There are major challenges in reducing this threat

The UK is acting but more needs to be done
Resistance is a deadly reality

- **25,000** people per year in Europe die of sepsis caused by resistant bacteria
- **23,000** deaths per year from sepsis caused by resistant bacteria in United States (conservative estimate)
- **1 child every 5 minutes** dies of infection caused by resistant bacteria in South East Asia
Proportion of cases with first line drug resistance or MDR-TB, UK, 2000-2012

Source: Enhanced Tuberculosis Surveillance (ETS), Enhanced Surveillance of Mycobacterial Infections (ESMI)
Data as at July 2013
Prepared by: TB Section, Centre for Infectious Disease Surveillance and Control, Public Health England
Percentage of new TB cases with MDR-TB

Source: WHO Global TB report 2013
XDR TB cases reported in the UK:

2010  -  3
2011  -  6
2012  -  2

Source PHE February 2014
Proportion of 3rd gen. cephalosporins Resistant (R) *Klebsiella pneumoniae* Isolates in Participating Countries in 2012
Movement of two strains of Carbapenem-resistant *Klebsiella pneumoniae* 2000 - 2008

**KPC**
- **2000:** First found in North Carolina
- **2003:** Isolates spread rapidly through New York
- **2005:** Found to be widespread throughout Israel
- **After 2005:** Spreads to Italy, Colombia and Sweden

**NDM**
- **Before 2008:** Resistance first identified in India
- **2009:** Discovered in Sweden
- **2010:** Discovered in the UK
- **2010:** Discovered in Canada

1 New-Delhi Metallo-beta-lactamase
AMR is not only a ‘health’ problem

Diagram based on Linton (1977), as adapted by Rebecca Irwin, Health Canada (Prescott 2000) and IFT
The UK Five Year Antimicrobial Strategy

Link to Strategy:
Key aims of the UK strategy

- **Prevent** (people from being infected)

- **Preserve** (the antibiotics we have)

- **Promote** (development of new antimicrobials, new approaches, better diagnostics)

Underpinning: knowledge and understanding of AMR
Main activities

1. Improving infection prevention and control practices in human and animal health
2. Optimising prescribing practice
3. Improving professional education, training and public engagement
4. Developing new drugs, treatments and diagnostics
5. Improving use of surveillance data
6. Improving identification and prioritisation of AMR research
7. Strengthening international collaboration
How is the strategy making this happen?

A UK Antimicrobial Resistance Strategy High Level Steering Group has been set up to oversee delivery

• Implementation plan to be published (November 2014)

• Annual progress report

• Outcome measures to be published

• Promotion of global co-operation

• Research and Development
The Scientific Challenges

• Molecular basis of emergence and spread of AMR
• Burden of AMR (surveillance)
• Transmission pathways – humans, animals and the environment
• Rapid diagnostic tests
• The discovery and development of new antimicrobials
• Novel treatments - bacteriophages, the microbiome, antisepsis
• Effective stewardship - behavioural and educational research
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Antibiotic development timeline

Source: British Society of Antimicrobial Chemotherapy
Economic challenges

- How can we make development of new antimicrobials worthwhile?
  - Antibiotics are relatively cheap compared to other medicines
  - Antibiotics are used for short durations (low sales volumes)
  - Resistance to new antibiotics can develop quickly

**Current arrangements deliver a low level of return on investment and are not economically attractive to industry**
Development of new medicines & technologies

The development of new antibiotics, diagnostics and other health technologies to fight AMR presents a number of challenges:

• there are few new technologies being developed to treat infections due to multi-drug resistant gram-negative bacteria – a sustainable supply is needed

• we require new innovative models to incentivise and reimburse R&D, balancing private commercial incentives with public stewardship

• scientific and regulatory concerns need to be addressed

Work underway includes:

• identifying the most effective and sustainable financial models for R&D of new technologies

• exploring the policy options to secure cross-Government consensus

• contributing to international work to streamline regulatory pathways

• engaging with industry, healthcare and other stakeholders in the UK and internationally to consider emerging thoughts
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Variation in use of antibiotics

Map shows incidence of GP antibiotic prescription in England by CCG in 2012

Substantial variation:
- 8.4% in Newcastle West (highest)
- 4.0% in Camden (lowest)

National average: 6.4%
Antibiotic prescribing is related to consultation rates

1. Consultation rate for RTI varies: 125–1100 per 1000 patients

2. Antibiotics prescribed in 45% to 98% of patients with RTI

3. Consultation rates related to prescribing

4. Practices who reduced prescribing experienced a reduced consultation rate

Thus patients can be retrained not to expect antibiotics

EU Community Antibiotic Consumption

DDD per 1000 inhabitants per day (2010)

- Greece
- Luxembourg
- Belgium
- France
- Italy
- Iceland
- Portugal
- Malta
- Poland
- Ireland
- Spain
- Finland
- Bulgaria
- Czech Republic
- Denmark
- Norway
- Hungary
- Austria
- Slovenia
- Germany
- Sweden
- Lithuania
- Netherlands
- Estonia
- Latvia

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What is happening to Primary Care prescribing in England?

Trends in prescribing antibacterials in General Practice in England

- Penicillins
- Cephalosporins
- Macrolides
- Sulphonamides & Trimethoprim
- Quinolines
- Metronidazole & Tinidazole
- All other bacterial drugs

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Major shifts in antibiotic prescribing

- Co-amoxiclav use in English hospitals has gone up by 64% over the last five years
- Antipseudomonal penicillin use in English hospitals has gone up by 194% in five years
- Carbapenem use in English hospitals has gone up by 111% in five years
- Fluoroquinolone use in English hospitals has gone down by 30% and then plateaued
- Cephalosporin use in English hospitals has gone down by 30%

Data provided by the Information Centre for the AMR Inquiry
English Surveillance Programme for Antimicrobial Usage and Resistance (ESPAUR)

- Establishment of a dedicated surveillance programme for AMR and AMU
- Contribute to the integration of existing AMR and AMU datasets across primary and secondary care
- Contribute to the real-time monitoring and measurement systems for antibiotic consumption in hospitals - to support antimicrobial stewardship in the NHS and the independent sector
- Development and publication of local susceptibility data reports by English region
- Review the systems developed to ensure that the antimicrobial usage data can be linked with C. difficile rates and other bacterial resistance surveillance data
- Enhance data analysis and advice on use of carbapenems and other Critically Important Antibiotics in the NHS and the independent sector

Source: PHE
Changing behaviour

Knowledge → Attitude → Behaviour

Goal: Improving antimicrobial stewardship / conserving existing treatments

• **Professionals**: improving prescribing practices
  
  Primary care: GP prescribing
  
  Secondary care: hospital prescribing

• **Public**: improving understanding about appropriate antibiotic use
How are we doing this?

- Antimicrobial prescribing and stewardship competencies - embedded in national curricula

- Development of Antimicrobial Prescribing Quality Measures for primary and secondary care

- Primary care: TARGET campaign: antibiotic prescribing guidance, learning resources and patient information leaflets

- Secondary care: Start Smart - Then Focus campaign – rapid treatment with appropriate antibiotics supported by rapid microbiology diagnosis

- European Antibiotics Awareness Day (EAAD): professionals and public awareness

- National workshops to explore and debate radical solutions to the AMR problem

- Identifying evidence-based behavioural interventions (e.g. delayed prescribing)
DH/NIHR funded AMR research
Strategic co-ordination and support is provided through:

Co-founders of the:

- UKCRC Translational Infections Research initiative and the
- Health Innovation Challenge Fund
- The National Institute for Health Research (NIHR) funds applied health research:
  - running a themed call on AMR across 8 NIHR funding streams,
  - funding two Health Protection Research Units on AMR and HCAI,
  - funds initiatives aimed at supporting new diagnostics
- AMR Research Funders Forum established to align funding decisions,
- International
Global mobilisation and co-operation

At the international level we need to:

• Raise **awareness** of the issue

• **Prevention** - collaborate to prevent the global spread of AMR (infection prevention and control, stewardship and conservation aspects)

• Research to understand **transmission**

• “One health” approach to tackling AMR and developing evidence on the AMR transmission interface between human, animal and wider environment

• to work with WHO, UN and other key international bodies to develop innovative **financing and regulatory** (licensing) approaches which will help stimulate development of new antibiotics.
International engagement to promote alignment and coordinated action

- AMR Thought Leaders meeting at Chatham House, June 2013
- G8 Science Ministers meeting, June 2013
- CMO England chairs WHO Strategic Technical Advisory Group (STAG),
- Keynote address at Chatham House conference “Antimicrobial Resistance - Incentivising Change towards a Global Solution” October 2013
- CMO chaired AMR session at the World Innovation Summit for Health in Doha, December 2013
- Proposed WHA resolution supported by over 50 countries, agreed at the WHO Executive Board in January and will go to WHA in May.
Awareness Raising
THINK THEY’RE CLEAN?
KNOW THEY’RE CLEAN.

GOOD HAND HYGIENE BY HEALTHCARE STAFF IS THE MOST EFFECTIVE WAY OF PREVENTING HEALTHCARE ASSOCIATED INFECTION

While you are in our care you should expect us to clean our hands, but if you think we’ve forgotten, it’s OK to ask.
Key web links

• UK Five Year Antimicrobial Resistance Strategy 2013 to 2018

• NIHR – website includes information on the Health Protection Research Units and the AMR themed call - www.nihr.ac.uk

• Health Innovation Challenge Fund www.hicfund.org.uk

• UK Clinical Research Collaboration - http://www.ukcrc.org/