Department of Health

Department for Environment Food & Rural Affairs

Version 1.2

UK 5 Year Antimicrobial Resistance (AMR) Strategy 2013-2018

- Measuring success

Northern Ireland Executive
www.northernireland.gov.uk

Llywodraeth Cymru
Welsh Government

The Scottish Government
Riaghaltas na h-Alba

June 2014

Title: UK 5 Year Antimicrobial Resistance (AMR) Strategy - Measuring success
Tracy Parker for the UK AMR High Level Steering Group, Public Health Directorate, Infectious Diseases and Blood policy, PH-HPER-ID&BP/10200
Document Purpose: Policy/Guidance/Transparency
Publication date: June 2014
Target audience: Clinical professionals, NHS managers, primary and secondary care prescribers, stakeholders other professionals, healthcare workers
Contact details: Department of Health, Room 118, Richmond House, 79 Whitehall, London SW1A 2NS amr@dh.gsi.gov.uk

Published to gov.uk, in PDF format only.

www.gov.uk/dh

UK 5 Year Antimicrobial Resistance (AMR) Strategy 2013-2018

Measuring success

Prepared by: The Infectious Diseases and Blood Policy Team for the UK AMR Strategy High Level Steering Group.

1. UK five year AMR strategy - measuring success

The UK AMR High Level Steering Group (HLSG), which comprises a range of government departments and agencies, was established to oversee and drive delivery of the strategy. It has agreed a set of measures to gauge the success of the UK AMR strategy in slowing down the growth in resistance.

Measures have been identified at this stage for the four areas below. In some areas, comprehensive data are available which can be used now to set out detailed measures. In other areas, the data are more limited. These measures will be reviewed and developed as data become available. More and better data are needed to give us a full picture of the national position in key areas and allow us to monitor trends over time. Work is also in hand to improve screening activities, so we are better able to identify patients infected with resistant organisms, with a view to developing an appropriate measure in this area in due course.

In this first year we have been concentrating on putting the building blocks in place to make sure that we can access the right information at the right levels in order to interpret the data appropriately and assess the effectiveness and impact of interventions in the longer term.

2. Trends in resistance

To assess whether the strategy is having an impact on the growth of resistance, the HLSG will review the trends in resistance as determined by the number of reported infections and the proportion resistant to specific antibiotics.

To assess whether our collective actions are having the intended effect across the health sector we will:

- collect data on the trend in the extent in resistance in a range of the most serious infections in patients in the UK,
- develop indicators to monitor changes in the clinical burden of these infections,
- review annually the list of key infections monitored.
- collect data on resistance trends in the animal health sector with a particular focus on key zoonotic bacteria of human importance.

To support this, we will:

- on an annual basis collect and collate data on resistance trends in key bloodstream infections and gonorrhoea in England (comprising both national and regional data), Wales, Scotland and Northern Ireland. In the first instance, data for 2013 will be made available, with the main focus being on the drug combinations listed in Table .1

Table: initial drug/bug combinations to be used for national surveillance of AMR

Bacteria	Antibiotic class	Metric
Klebsiella spp.	Cephalosporin	% non-susceptible to cefotaxime or ceftazidime
Klebsiella spp.	Carbapenem	% non-susceptible to imipenem or meropenem
E. coli	Cephalosporin	% non-susceptible to cefotaxime or ceftazidime
E. coli	Carbapenem	% non-susceptible to imipenem or meropenem
E. coli	Fluoroquinolone	% non-susceptible to ciprofloxacin
E. coli	Aminoglycoside	% non-susceptible to gentamicin
Pseudomonas	Cephalosporin	% non-susceptible to ceftazidime
Pseudomonas	Carbapenem	% non-susceptible to imipenem or meropenem
N. gonorrhoeae	Cephalosporin	% non-susceptible to ceftriaxone
S. pneumoniae	β-lactam	% non-susceptible to penicillin

- Data for a secondary (shadow) set of drug/bug combinations (Table 2) will also be considered by the HLSG with a view to potentially expanding the list of infections to be reported.

Table 2. Secondary ("shadow") list of drug/bug combinations for possible inclusion in national surveillance in the future.

Bacteria	Antibiotic class	Metric
S. aureus	B-lactam	% non-susceptible to meticillin
Enterococci	Glycopeptide	% non-susceptible to vancomycin
K. oxytoca	Cephalosporin	% non-susceptible to cefotaxime or ceftazidime
K. oxytoca	Carbapenem	% non-susceptible to imipenem or meropenem
K. oxytoca	Fluoroquinolone	% non-susceptible to ciprofloxacin
K. oxytoca	Aminoglycoside	% non-susceptible to gentamicin
Acinetobacter spp.	Polymyxin	% non-susceptible to colistin
E. coli	β-lactam	% non-susceptible to piperacillin/ tazobactam
K. pneumoniae	β-lactam	% non-susceptible to piperacillin/ tazobactam

- On the animal health side, continue to actively monitor resistance in *Salmonella sp*. obtained from poultry and pigs and, in line with new statutory EU requirements, introduce active monitoring programmes for resistance in *Campylobacter jejuni* obtained from poultry, and resistance in commensal *E.coli* obtained from poultry and pigs. Drug-bug resistance data are being collected for the combinations listed below:

Table 3

Bacteria	**Antibiotic class**	**Metric**
*Salmonella and Commensal E.coli **	β-lactam	% resistant to penicillin
	Cephalosporin	% resistant to cefotaxime or ceftazidime
	Carbapenem	% resistant to meropenem
	(Fluoro)quinolone	% resistant to ciprofloxacin or nalidixic acid
	Tetracycline	% resistant to tetracycline
	Polymixin	% resistant to colistin
	Aminoglycoside	% resistant to gentamicin
	Sulphonamide/trimethoprim	% resistant to trimethoprim or sulfamethoxazole
	Glycycline	% resistant to tigecycline
	Amphenicol	% resistant to chloramphenicol
	Macrolide	% resistant to azithromycin
Campylobacter jejuni.	Macrolide	% resistant to erythromycin
	Fluoroquinolone	% resistant to ciprofloxacin or nalidixic acid
	Tetracycline	% resistant to tetracycline
	Aminoglycoside	% resistant to streptomycin or gentamicin

***** *Salmonella or commensal E.coli isolates that are resistant to carbapenam or cephalosporin classes of antibiotics will be tested against another panel of antibiotics which includes additional antibiotics from these two classes.*

These antibiotic sensitivity data will be published, in the VMD Veterinary Antibiotic Resistance and Sales Surveillance (VARSS) annual report by October 2014 in a way which permits comparability of data between human and veterinary reports.

From 2015:

- the presence of specific resistance mechanisms in *E.coli* obtained from pigs and from poultry will be monitored. Work will also be initiated to check for the presence of resistant *E.coli* isolates obtained from retail meat samples of pork, chicken and beef.

Background

Until now, we have not collected the data we need to measure changes in levels of antibiotic resistance and prescribing across the healthcare system in all parts of the UK. We are developing a system for England which allows this to happen. Currently we have data from about 60 per cent of medical laboratories in England and expect this to rise to 75 per cent by March 2015. Ideally we would like to see data from all laboratories so that we can make robust comparisons at local level. Until then, we will only be able to provide a national and regional picture of the clinical burden of AMR and changing resistance trends. Work is in hand to bring together the prescribing data for clinical commissioning groups and data for hospitals (secondary care) to help determine the impact of changes in prescribing. Monitoring serious bloodstream and gonococcal infections (table 1) over time, and the antibiotics used to treat them, will allow us to assess whether those antibiotics continue to be effective over time.

In addition, there is a need to agree a standard way of measuring, and tracking, the levels and burden of antimicrobial resistance in humans and animals to see whether actions taken at a national or international level are having an impact.

3. Improving quality of prescribing in primary and secondary healthcare settings

To assess whether the strategy is having an impact on reducing the level of inappropriate antibiotic use, the HLSG will review the trends in prescribing.

Measuring antibiotic usage in both humans and animals, together with information about the prevalence of infections, will serve as a high level marker of the impact of our actions to reduce use.

To assess whether prescribing is improving, the HLSG will focus on measuring changes in total prescribing, and particularly whether inappropriate use of critically important antibiotics is reducing. Our initial objective will be to return antibiotic prescribing to 2009 levels in primary care and 2012 levels in secondary care.

Initially, the following will be measured in 2014/15:

Primary care

- total antibiotic consumption, using Quality Innovation Productivity Prevention (QIPP) comparators [1],
- proportion of antibiotics prescribed from the cephalosporin and fluoroquinolone classes (prescription items as a percentage of total antibiotic prescription items),

Secondary care

- total antibiotic consumption per annum (defined daily doses per 1,000 occupied bed days and per 1,000 admissions),
- total carbapenem antibiotic consumption per annum (defined daily doses per 1,000 occupied bed days and per 1,000 admissions).

Veterinary sector

- total weight of antibiotic sold for use in the veterinary sector, analysed at level of antibiotic class, will be collated and published on an annual basis, in the UK VARSS report.

A range of balancing measures to monitor for unintended consequences or reasons for alterations in prescribing will be monitored including hospital admissions for suppurative complications of upper respiratory tract infections and GP consultations. Fuller refinements to the prescribing measures are in development to be considered for use across the NHS over the length of the strategy and will be reported in the annual progress report.

[1] The current QIPP comparator measures prescriptions per STAR PU. The STAR-PU is a measure devised by the Health and Social Care Information Centre which enables differing GP practices to be compared on a like for like basis.

Background

There is variation across the country in the levels and appropriateness of antibiotic prescribing. To address this we need actions that will reduce the overall level of prescribing as well as the variation at local level, and ensure that antibiotics are prescribed appropriately, safely and effectively.

In 2011 the DH commissioned the Health and Social Care Information Centre (HSCIC), together with NICE's Medicines and Prescribing Centre, to develop a number of evidence based measures of prescribing activity in response to concerns about growing antibiotic use. Two comparators looking at general antibacterial use were developed. DH, NHS England, HSCIC and NICE have recently reviewed the suite of prescribing comparators with a view to implementing changes in the measures used for 2014/2015.

In addition, programmes are in place to strengthen quality and consistency of prescribing data in primary and secondary care with a view to contributing to a further reduction in prescribing by 2018.

There is a risk of unintended consequences in taking action to reduce AMR by altering antibiotic prescribing practices. This is an area to which ARHAI is giving active consideration. For example, pressure to reduce antibiotic prescribing should not result in the inappropriate treatment of infections, in either veterinary or human health sectors.

In the animal sector work is underway to develop a means of obtaining information on the quantities of veterinary antibiotics used to treat infections in different species, to contribute to an understanding of the appropriateness of antibiotic use in different animal groups. These data will also be used to inform negotiations on revision of the EU legislative framework on veterinary medicines in which the harmonisation of the collection of data on the use of veterinary medicines across Europe is being considered.

4. Improving public and professional knowledge and understanding of antimicrobials and their appropriate use.

To assess whether the strategy is having an impact on the growth of resistance, the HLSG will review the quality of antibiotic stewardship.

To underpin measures [1] and [2] we are working to improve public and professional knowledge about AMR and thereby reduce demand and improve prescribing.

Public awareness and behaviour will be monitored from 2014 through:

- a survey of use, knowledge and attitudes on antibiotics amongst adults in England.

From 2015, the impact of interventions to reduce antibiotic use through professional engagement will be monitored by:

- measuring the uptake of the “TARGET Antibiotics” tool-kit by CCGs, and the “Start Smart Then Focus” toolkit for use by NHS Trusts,
- annual evaluation of the impact of European Antibiotic Awareness Day activities in the UK (for medical and veterinary professionals, animal keepers, and the general public).

Background

This work will be underpinned by a range of activities being carried out at a local level as part of the ongoing stakeholder engagement, aimed at the public and professions to encourage more responsible use of antibiotics in all settings.

5. Strengthening global security through ensuring global alignment in addressing AMR

The HLSG will review the actions taken by the UK to garner increased international collaboration to minimise the global spread of AMR, including the adoption of the "One-Health" approach.

AMR is a global issue, affecting health, productivity and, ultimately, economic growth. The UK is continuing to actively drive forward, influence and secure support for work in a range of international fora to shape delivery of a comprehensive programme of work to address the AMR threat and improve global health security.

Strengthening global security is a long term goal involving collaboration of many countries. The impact of the UK alone in this long term goal will be difficult to measure. Progress will be assessed through the achievement of a series of milestones relating to the contribution of the UK to the international effort.

Agreement on the new WHO AMR Resolution was secured at the 67th World Health Assembly in May 2014. It places an onus on Member States to take a broad range of actions at national level to tackle AMR and on the WHO to work with others to develop a global action plan by May 2015, http://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_R25-en.pdf

Milestones for the UK in 2014/15 include:

- champion new work to implement the new WHO AMR resolution, in a way which applies a "One-Health" approach,
- actively contribute to and support the WHO in its work to lead development of the global action plan and AMR indicators by 2015,
- influence further tripartite working with the FAO and the OIE to deliver actions that will lead to changes in support of the one health approach to tackle AMR,
- develop the Commonwealth laboratory twinning initiative between higher and lower income countries to contribute to strengthening control of AMR,
- actively contribute to the Global Health Security Agenda.

In the longer term, global progress in achieving strengthened AMR control will be assessed by:

- evaluating the delivery of commitments by Member States in response to AMR action plans agreed internationally, in support of a one health approach,
- and using the internationally agreed indicators to monitor progress and the impact of action taken at a global level.

Background

The UK international AMR work programme aims to garner increased international support for a "one health" approach to tackling AMR. This includes taking a leading role in work with key international bodies to develop innovative financing and regulatory approaches to help stimulate development of new antibiotics and rapid diagnostics.