Advisory Committee on Antimicrobial Resistance and Healthcare Associated Infection (ARHAI)

7th Annual Report, April 2015 - March 2016

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Chair's Foreword

Antimicrobial resistance (AMR) remains a major threat to human health. Since the publication of the 'UK 5 Year Antimicrobial Resistance Strategy' in 2013, much work has been done to begin to tackle this issue across the UK. The strategy aims to improve the knowledge and understanding of antimicrobial resistance, conserve and steward the effectiveness of existing treatments and stimulate the development of new antibiotics, diagnostics and novel therapies.

The global threat of antimicrobial resistance was recently highlighted in the O'Neill report, with estimates of 10 million deaths per year and a total loss of $100 trillion to GDP attributed to AMR by 2050.

2015/16 has seen ARHAI provide expert advice and drive forward work across the AMR agenda. Gram-negative infections were again a primary focus of the committee, with subgroups working on recommendations for data feedback to hospitals, providing evidence based recommendations on reducing these infections and crucially suggesting a 60% reduction of these infections over three years.

Work continued on the reduction of inappropriate antimicrobial prescribing, with the committee recommending a 60% reduction in inappropriate prescribing over three years. Following recommendations from ARHAI, a Quality Premium and CQUIN were approved for primary and secondary care across NHS England in 2016/17. Both measures aim to reduce both total and broad spectrum prescribing.

I am indebted to Isabel Boyer, Peter Hawkey and Cliodna McNulty for their contributions to ARHAI and wish them well as they leave the committee. The committee was pleased to welcome Mrs Carol Hugyebaert to the secretariat team.

Professor Mike Sharland
Professor of Paediatric Infectious Diseases,
St George's, University of London
Chair, Advisory Committee on Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI)

Plain English Summary

ARHAI is one of the committees set up to provide the Government with practical and scientific advice. It does so in three areas: antibiotic resistance, hospital acquired infection, antibiotic prescribing. This report describes the work it has done between April 2015 and March 2016.

Bacteria are increasingly resistant to the antibiotics we use to kill them. This is a major problem for us all. ARHAI's approach based on the UK's five year strategy is to monitor levels of resistance, to reduce the number of hospital acquired infections and improve the use of antibiotics.

Antibiotic Resistance
Antibiotics are used to treat bacterial infections. Resistance happens when a particular antibiotic (drug) no longer works against a particular bacteria (bug). These are called drug/bug combinations. ARHAI decides which of these combinations are the most important to be kept under review. There are two other important and difficult problems. Some bacteria are resistant to many types of antibiotics or even to antibiotics that are called of last resort, to be used only when no others will do. To address this problem, ARHAI has made recommendations, including that it is important to agree the optimal method of keeping track of which bacteria is resistant to which drug, of any changes and how this information can be fed into national guidance for prescribers, including GPs. (page 12).

Hospital Acquired Infections
When a patient picks up an infection in hospital it can lead to severe illness and even death. The key is to quickly identify and treat infected patients and to have very good infection prevention controls in place. MRSA and *C. diff* are two well-known hospital infections but better hygiene has been effective in getting the numbers down and keeping them down. . Unfortunately infections caused by a large group of bacteria known as Gram-negative are on the increase. These bacteria are called Gram-negative because they do not pick up a coloured stain used in a laboratory to identify types of bacteria. The group includes familiar ones like *E. coli* and less familiar ones like *Klebsiella*. They cause infections such as pneumonia, and, urinary tract or surgical site infections. At present the number of infections caused by these bacteria is steadily rising and ARHAI recommends ways to understand the total burden of infections caused by Gram-negativebacteria and aid the design of interventions to reduce them (page 10).

Antibiotic Prescribing
Over or inappropriate prescribing of antibiotics is one way resistance develops. ARHAI has made recommendations to reduce both the total number of antibiotics prescribed as well as the number of prescriptions for certain antibiotics. These

recommendations are called prescribing quality measures and are reviewed every year by APRHAI (page 15-17).

An Integrated Indicator

Indicators can be used to report on aspects of complicated systems like the NHS to give a reliable view of its well-being. Work has been done on developing indicators that provide an overview of infections, antibiotic resistance and antibiotic use and these indicators, known as “AMR-local indicators”, are now visible and available for consultation on the internet on the “Fingertips” website (page 11).

Abbreviations

AG	Antibiotic Guardian
AMP	Antimicrobial Prescribing
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
APQM	Antimicrobial Prescribing Quality Measure
ARHAI	Antimicrobial Resistance and Healthcare Associated Infections
CDI	*Clostridium difficile* infection
CoPSAC	Code of Practice for Scientific Advisory Committees
CQUIN	Commissioning for Quality and Innovation
DARC	Defra Antimicrobial Resistance Coordination group
Defra	Department for Environment, Food and Rural Affairs
DH	Department of Health
EAAD	European Antimicrobial Awareness Day
ESPAUR	English Surveillance Programme for Antimicrobial Utilisation and Resistance
GNHABSI	Gram-negative healthcare-associated bloodstream infections
HCAI	Healthcare Associated Infections
HLSG	High Level Steering Group (for the UK 5 year AMR strategy)
HPRU	Health Protection Research Unit
ICU	Intensive Care Unit
MDR	Multi-drug Resistant
MRSA	Meticillin Resistant *Staphylococcus aureus*
PHE	Public Health England

Introduction

Remit

ARHAI was established in April 2007 to provide practical and scientific advice to DH on strategies to minimise the incidence of HCAI and to maintain the effectiveness of antimicrobial agents in the treatment and prevention of microbial infections in man and animals. In making recommendations, the committee takes into account the relevant work of other expert groups in the human and veterinary fields.

From 2013, ARHAI has made recommendations to the High Level Steering Group (HLSG) for the UK 5 year AMR strategy and has formed a partnership with national bodies such as PHE and NHS England to enable pragmatic and effective implementation of ARHAI recommendations.

Meetings

In 2015/16, ARHAI's meeting format reflected the main areas within the committee's remit: HCAI; AMR; AMP. The committee holds three main meetings per year, focusing on these areas sequentially in spring, summer and autumn. Meetings commence with a focused session on the main theme, provided by external speakers, giving technical updates on for example current research, surveillance and epidemiology.

A further meeting, involving the Chair, deputy-chair, sponsor and secretariat, is held each winter to review the committee's work over the past year, consider current and upcoming outputs and determine the forthcoming years' work programme. ARHAI also meets with counterparts at the DARC to discuss cross-cutting "one health" aspects of infectious disease and antimicrobial resistance on an annual basis.

ARHAI Subgroups

Increasingly, the committee's work is carried forward by 'task and finish' subgroups; established to develop evidence-based guidance and other detailed pieces of work. Subgroups are chaired by a member of ARHAI and include co-opted experts relevant to the task. Subgroup reports and recommendations are considered at the main committee meetings. Following agreement, advice is provided to the DH sponsor for consideration and, where appropriate, implementation.

Openness and Transparency

ARHAI is an independent expert science advisory committee that operates in accordance with the Code of Practice for Scientific Advisory Committees, 2011.[1] As such the agenda open papers and minutes of meetings are published and accessible from the ARHAI webpage. [2,3]

Declarations of interest are posted on the ARHAI webpage and are updated annually. Members are invited to declare interests at the beginning of each meeting. Declarations of interest are dealt with on a case by case basis and in line with government guidance (Making and Managing Public Appointments - A Guide for Departments.[4])

Membership

The ARHAI membership list may be found on the ARHAI webpage, members present during the remit of this report may be found in Annex A. New members are appointed by the Department of Health's Senior Responsible Officer and are accountable to the Chair for carrying out their duties and for their performance. Members are expected to demonstrate a commitment to and an understanding of the value and importance of the seven principles of public life and act in accordance to CoPSAC guidance.

Public and Patient Information

ARHAI is dedicated to evolving and improving its engagement with the public. It strives to make its work better understood by the public and ensure that the work it undertakes is for the benefit of patients and the public. Inclusion of a lay summary is compulsory for all papers presented to the committee.

[1] http://www.bis.gov.uk/assets/goscience/docs/c/11-1382-code-of-practice-scientific-advisory-committees.pdf
[2] https://www.gov.uk/government/groups/advisory-committee-on-antimicrobial-resistance-and-healthcare-associated-infection
[3] http://webarchive.nationalarchives.gov.uk/20130402145952/http://transparency.dh.gov.uk/tag/arhai-minutes/
[4] http://www.civilservice.gov.uk/wp-content/uploads/2011/09/public_appt_guide-pdf_tcm6-3392.pdf

Healthcare associated infections

HCAIs are infections that occur following or during a healthcare intervention undertaken in a healthcare setting. HCAIs remain a major cause of avoidable morbidity and mortality in patients admitted to hospital. The consequences of HCAIs are frequently the most severe in patients with weakened immune systems for example the very young, the very elderly, patients within ICUs, patients on treatment for other diseases such as HIV and cancer, which suppress their immune systems.

The incidence of HCAIs within NHS hospitals in England is monitored by surveillance using both continuous surveillance and, less frequently, point prevalence ('snapshot') surveys. Data are collated and analysed by PHE and provide an indication of the prevalence of HCAIs, the impact of infection prevention and control measures and emerging issues at both national and local levels.

The landscape of HCAIs continues to change. The incidence of both meticillin resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* (*C. difficile*) in English NHS hospitals has fallen markedly, and focus has shifted to the increasing burden of infections caused by Gram-negative organisms such as *E. coli*.

E. coli

Incidence of bacteraemia caused by multi-drug resistant (MDR) Gram-negative bacteria such as *E. coli* has been steadily increasing since 2005.

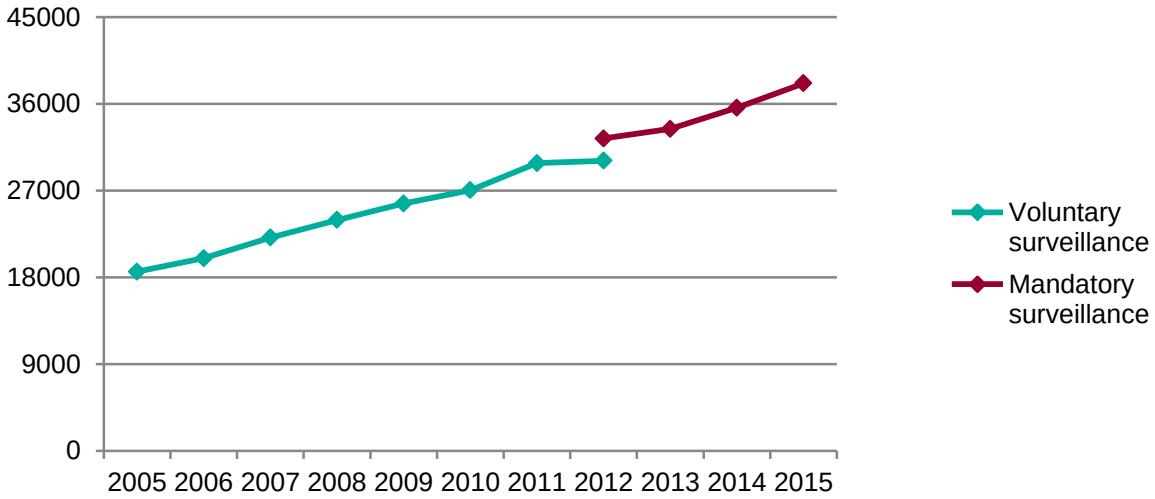

Figure 1: Total *E. coli* bacteraemia from voluntary and mandatory surveillance systems. Data imported from the PHE surveillance service[5]

[5] https://www.gov.uk/government/collections/escherichia-coli-e-coli-guidance-data-and-analysis

Surveillance of Gram-negative healthcare associated bloodstream infections

Trust-level rates of bacteraemia are available for *E. coli* from the PHE mandatory surveillance programme. By contrast, data on bacteraemia caused by other Gram-negative pathogens is currently derived from laboratory reporting undertaken on a voluntary basis. Thus, there is incomplete case ascertainment and data on rates of infection in individual Trusts are not readily available, as some laboratories undertake services for more than one hospital.

In February 2015, ARHAI established a subgroup to make recommendations to improve understanding of the total burden of healthcare-associated bloodstream infections caused by Gram-negative organisms and aid the rational design of interventions to decrease these infections. The subgroup agreed *Klebsiella* spp., *Enterobacter* spp., *Pseudomonas* spp., *Proteus* spp., *Serratia* spp., *Acinetobacter* spp., *Stenotrophomonas maltophilia* and *Citrobacter* spp as the key Gram-negative organisms to focus on. The subgroup aimed to feed existing surveillance data back to hospitals at a local level as information for action.

At the May ARHAI meeting, PHE reported the development of reports to feedback collected data on Gram-negative infections to hospitals. The committee endorsed a proposal to establish a subgroup to recommend practical and simple advice to reduce Gram-negative healthcare-associated bloodstream infection rates. This subgroup would review current infection control guidance[6,7] and distil this into key evidence based actions. Formal recommendations are due to be reported to ARHAI in June 2016.

Defining Quality Measures for reduction in Gram-negative infections

ARHAI established a task and finish subgroup to develop quality measures for infection prevention and control, akin to antibiotic prescribing measures discussed later in this report. The focus of the sub-group was on the reduction of Gram-negative bacteria; *E. coli*, Klebsiella, Enterobacter and Pseudomonas and a recommendation was made for a 60% reduction in all over three years. The Chair recognised the ambition of these reductions and that much work would need to be done to implement measures to achieve such reductions.

[6] http://www.journalofhospitalinfection.com/article/S0195-6701(13)60012-2/fulltext
[7] http://www.sciencedirect.com/science/article/pii/S1473309914708540

AMR local indicators on PHE's Fingertips

The UK AMR strategy implementation plan made a commitment to explore the possibility of developing a new integrated indicator for HCAI and AMR to allow better access to and use of surveillance data. In May 2015, ARHAI established a task and finish subgroup to refine the scope of the indicator in terms of clinical utility and applicability within the healthcare system and recommend implementation options to the High Level Steering Group for the UK 5 year AMR strategy. Following advice from ARHAI and development at PHE, the new integrated indicator, named the AMR local indicators, went live on the 5th of April 2016[8].

The AMR indicators bring together existing data streams and include the following five domains:

- **Antimicrobial resistance** –percentage of *E.coli* and bloodstream infections susceptible to Carbapenems.
- **Antibiotic prescribing** – translated on to the system from quality measures.
- **Healthcare associated infections** – MRSA, MSSA, *C. difficile* and E. coli (from mandatory reporting)
- **Infection prevention and control** – single rooms and single rooms with ensuite available on ERIC and cleaning at Trust level.
- **Antimicrobial stewardship** – Trusts with Start Smart then Focus Action plans and engagement with the antibiotic guardian campaign.

Data may be seen at GP, CCG and Acute Trust geographies, although not all indicators may be available at each geography. Data can be grouped by sub-region to allow comparison with peers. Going forward, AMR indicators will be made available at local authority geographies and links will be provided to infection prevention and control and antibiotic stewardship resources.

[8] https://fingertips.phe.org.uk/profile/amr-local-indicators

Antimicrobial resistance

One of seven key aims of the UK five year AMR strategy is better access to and use of surveillance data. This can be achieved through greater consistency and standardisation of data collected and improved data linkage. ARHAI was commissioned by DH to determine the critically important antibiotic resistances and specific bacterial infections, so called drug/bug combinations, to be included in surveillance with reference to the best available evidence (Table 1).

Key Drug/Bug Combinations	
Species	**Antibiotic class**
Klebsiella spp.	Cephalosporin
Klebsiella spp.	Carbapenem
E. coli	Cephalosporin
E. coli	Carbapenem
E. coli	Fluroquinolone
E. coli	Aminoglycoside
Pseudomonas spp.	Cephalosporin
Pseudomonas spp.	Carbapenem
N. gonorrhoeae	Cephalosporin
S. pneumoniae	*B*-lactam

Table 1: Key drug/bug combinations to be used for national surveillance of AMR[9]

At the May 2015 AMR meeting, the latest data on drug/bug combinations were presented for the committees' attention. Of particular concern were the reported rates of co-amoxiclav and piperacillin/tazobactam resistance in both *E. coli* and *K. pneumoniae*, which had markedly increased year on year since 2009. There had been changes in the methodology for detecting resistance to both of these antibiotics in recent years, following the introduction of EUCAST amended Clinical Break Points (CBPs). It was not clear therefore the degree to which changes in methodology accounted for the increases seen, and how much could be explained by a definite rise in resistance to these antibiotics. It was likely that in the years preceding 2010/11 resistance to co-amoxiclav had been under-recognised. PHE agreed to perform further investigations to quantify the degree of real increases in resistance.

[9] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322358/Outcome_measures.pdf

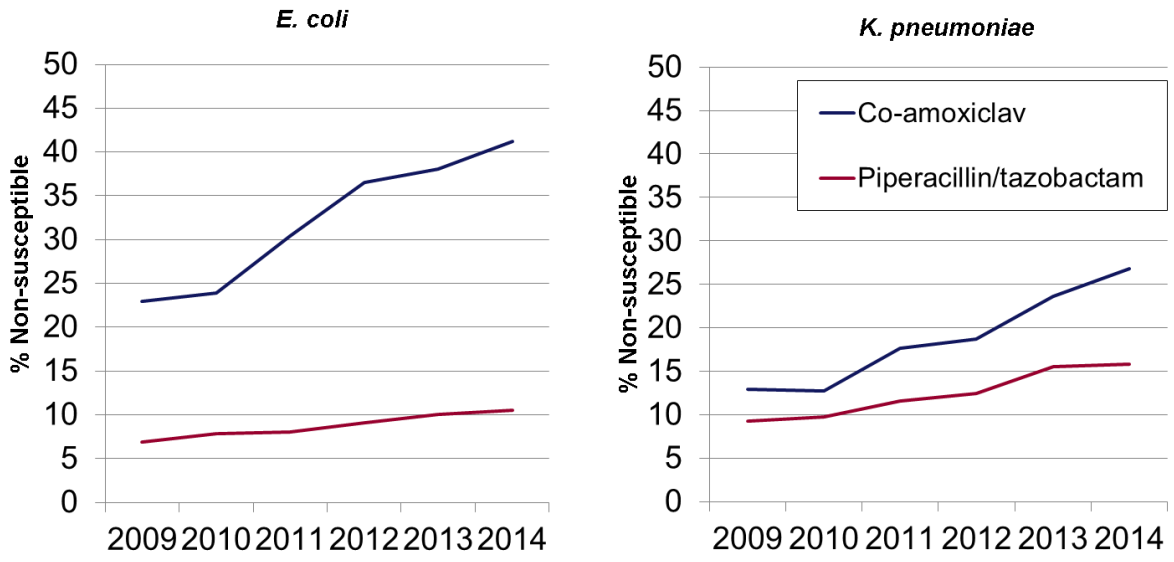

Figure 2: Percentage non-susceptibility of *E. coli* and *K. pneumoniae* to co-amoxiclav and piperacillin/tazobactam[10]

The committee discussed the clinical utility of co-amoxiclav and piperacillin/ tazobactam in light of the resistance data presented. There was concern that both increased resistance to co-amoxiclav and piperacillin/tazobactam would feed pressure to switch to carbapenem use in hospitals, a drug of last resort. It was suggested that surveillance data in general but specifically the much increased resistance rates presented to the committee should influence clinical guidelines for antimicrobial prescribing. ARHAI agreed that it would be helpful to determine the optimal method whereby changing national rates of AMR should feed into national antibiotic prescribing guidance by BNF or NICE.

ARHAI/DARC Colistin workshop

In February 2016, ARHAI and the DARC group held a workshop to discuss the growing concern of colistin resistance in light of the emergence of transmissible resistance gene MCR-1.

Colistin was first used in livestock in 2004 for treatment of non-invasive *E. coli* infections in the UK?. In 2016, RUMA (Responsible Use of Medicines in Agriculture) had requested that colistin be used as a last resort treatment. Use in agriculture is considered low in the UK at less than one ton each year and this makes the UK one of the lowest users in Europe in the agricultural setting. However, in the UK, colistin use in humans is high in comparison to Europe, with the majority of use seen in Cystic Fibrosis patients, for treating recurring respiratory infections such as

[10] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/477962/ESPAUR_Report_2015.pdf

Pseudomonas. This correlates with the UK also having amongst the highest incidence of Cystic Fibrosis patients in Europe.

Incidence of colistin resistant bacteria from imported food was an area which required investigation. The Food Standards Agency (FSA) was participating in monitoring of food stuffs and PHE was assisting them in genomic sequencing of isolates. These data are awaited and the committee requested that results be made available to them.

Antimicrobial prescribing and stewardship

Antimicrobial prescribing quality measures

In 2014, the ARHAI antimicrobial prescribing quality measures (APQM) subgroup proposed an aspiration for primary pare prescribing to reduce total antibiotic consumption by 1%. This has been translated into an NHS England quality premium for 2015/16. Preliminary data indicated that a 1% reduction in the total number of prescriptions had been met in the first quarter of the 2015 financial year. Therefore the aspiration had been achieved nationally, and at least 50% of CCGs had reached this aspiration in the first two months of the Quality Premium.

A second aspiration for primary care was to reduce prescribing of broad spectrum antimicrobials as a percentage of the total antibiotics prescribed in primary care to 10% from each CCG's 2013/14 value, or to be below the 2013/14 median proportion for English CCGs (11.3%), whichever represents the smallest reduction for the CCG in question. Two-thirds of CCG's had met this aspiration in the first quarter of 2015/16, but there was a large degree of variation between CCGs and it was thought that effort should be concentrated on reducing this.

Following the initial success of the 2015/16 quality premium, ARHAI were asked by NHS England to recommend further aspirations for a 2016/17 quality premium and for the development of a CQUIN (Commissioning for Quality and Innovation Payments) indicator to reduce both total and broad spectrum prescribing in secondary care. The recommends were put forward as follows;

Recommendation 01: for primary care aspirations;

> I. Total antibiotic prescribing to be reduced by 3% of the previous year's total at CCG level as measured by number of antibiotic prescriptions ("items") per 100 patients per year.
> II. Proportion of antibiotics from cephalosporin, quinolone or co-amoxiclav classes to be reduced to less than the current median for English CCGs as measured by the number of prescriptions ("items") from target classes in comparison with the total number of antibiotic prescriptions per year

Recommendation 02: for secondary care aspirations;

> I. Total antibiotic consumption to be reduced by 1% per annum 2015-2019 as measured by DDD per 1000 admissions per year.
> II. Total carbapenem consumption to be reduced by 1% per annum 2015-2019 as measured by DDD per 1000 admissions per year
> III. Total piperacillin-tazobactam consumption to be reduced by 1% per annum 2015-2019 as measured by DDD per 1000 admissions per year

Safety Monitoring

ARHAI recognised the need to monitor for unintended consequences arising from the reduction in both total and broad spectrum prescribing. This work is currently underway at the Health Protection Research Units at Imperial College, London. The first stage of this research is to link CPRD (Clinical Practice Research Datalink) patient demographics with Hospital Episode Statistics (HES) data to enable an overview of the patient pathway. The research will look at increased mortality and morbidity of infection as a result of reduced prescribing. Initial results are due in early 2017.

Optimal prescribing in primary care

In addition to work on quality indicators to reduce prescribing, ARHAI established a subgroup to determine the feasibility of establishing an optimum safe range of antibiotic prescribing in primary care. The subgroup suggested two ways to approach this; by either setting condition specific quality indicators or by setting absolute target dates for reducing total? prescribing. To enable condition specific indicators to be effective, they would need to be set at a patient population level (e.g. shore throat per X population). Such measures were likely to be useful for local audit but not for national policy setting until centralised data from e-prescribing was available. The second method, target dates for total prescribing, was currently in use in Sweden based on modelling figures. Here a consensus guideline was set and modelled on nation and regional targets. After 4 years, a 15% reduction was seen in outpatient prescribing, a 5.5% overall reduction. There was a consensus that further work on such a model should be taken forward as a matter of urgency to determine optimal levels of community prescribing.

Heterogeneity and diversity of prescribing

Within the UK 5 year strategy, there is a commitment to encourage heterogeneity and diversity of antimicrobial prescribing. The 2014 ESPAUR report had shown that a relatively small number of antibiotics were used within the NHS. An ARHAI subgroup was previously established to advise on measuring heterogeneity, the current heterogeneity range of prescribing in secondary care and to advise on methods to increase the heterogeneity of antibiotic prescribing within the NHS.

The subgroup received funding from NHS England to take forward a research project to apply an algorithm to an antimicrobial dataset for secondary care and analysis was underway. It was thought that there was not yet sufficient evidence to scale the approach to a national level, but further investigation would be carried out. If thought scalable, further discussion would be required around how best to encourage diversity of antibiotic use. It was felt in the first instance that heterogeneity data should be fed back to Trusts.

Following concerns of overprescribing of meropenem, ARHAI considered approaches to reduce meropenem use. Three strategies were considered; utilisation of local antimicrobial stewardship audits and feedback to prescribers, microbiologists providing restrictive advice and antimicrobial strategies, which focus on the use of alternative combinations of antibiotics, however here the evidence base, was poor. The approaches were felt to fit well with the drive for heterogeneity of prescribing and the recently published antibiotic stewardship guidance from NICE. However, it was noted that hospitals generally reserve meropenem for very ill patients and thus, clinicians may feel that the margin of safety was too narrow not to prescribe meropenem. To move the debate forward, it was hoped that ARHAI would published a paper on the issue to open up public debate.

Summary

During 2015/16, ARHAI made several recommendations and undertook work in several subgroups across a wide range of priorities in AMR. ARHAI continues to work in support of the ‘UK 5 Year Antimicrobial Resistance Strategy’ with priorities going forward into 2016/17 being; reduction in inappropriate prescribing, reduction in Gram negative infections and the issues arising from these two aims.

Annex A

ARHAI membership

Member	Profession	Organisation
Professor Mike Sharland (Chair)	Professor of Paediatric Infectious Diseases	St George's Hospital
Professor Mark Wilcox (Deputy Chair)	Professor of Medical Microbiology	Leeds Royal Infirmary
Jane Binyon	Lay Member	
Isabel Boyer	Lay Member	
Dr Kieran Hand	Consultant Pharmacist of anti-infectives	University Hospital Southampton
Professor Alastair Hay	Professor of Primary Care	University of Bristol
Professor Peter Hawkey	Professor of Clinical and Public Health Bacteriology	Birmingham Heartlands Hospital
Professor Alan Johnson	Head of HCAI & AMR (Healthcare Associated Infections & Antimicrobial Resistance) Department	Public Health England
Mr Martin Kiernan	Nurse Consultant	Southport and Ormskirk Hospital NHS Trust
Professor David Livermore	Professor of Medical Microbiology	University of East Anglia
Dr Cliodna McNulty	Head of PHE Primary Care Unit	Gloucestershire Royal Hospital
Professor Michael Moore	Professor in Primary Health Care Research	University of Southampton
Professor Peter Moss	Consultant in Infectious diseases	Hull & East Yorkshire Hospitals NHS Trust
Professor Andrew Peter Wilson	Professor of Microbiology & Consultant Microbiologist	UCLH NHS Foundation Trust

Department of Health

Mr Mike DeSilva (Sponsor)
Ms Maree Barnett (Assessor)
Ms Sally Wellsteed (Assessor)

Pharmacist Lead to ARHAI

Dr Diane Ashiru-Oredope (September 2010 - Present)

Public Health England Secretariat

Ms Caroline Purslow (June 2016 – present)
Dr Emma Budd (September 2013 – June 2016)

Mrs Carol Huygebaert

Observers

Mr Tim Baxter (Department of Health)
Mr Brian Brown (Care Quality Commission)
Dr Anna Cichowska (Public Health England)
Dr Matthew Fogarty (NHS England)
Mrs Carole Fry (Public Health England)
Mrs Tracey Gauci (Welsh Government)
Mr Paul Green (Veterinary Medicines Directorate)
Dr Katherine Healey (Veterinary Medicines Directorate)
Professor Anthony Kessel (Public Health England)
Dr Anne Kilgallen (Department of Health, Northern Ireland)
Mr Philip Howard (NHS England)
Professor Alistair Leonard (Health Protection Scotland)
Ms Thara Raj (Public Health England)
Dr Elizabeth Reaney (Department of Health, Northern Ireland)
Dr Andrew Riley (Welsh Government)
Ms Jenny Thorne (NHS Wales)
Dr Bruce Warner (NHS England)
Professor John Watson (Deputy Chief Medical Officer)

Annex B

Glossary

Antibiotic A drug that destroys or inhibits the growth of bacteria. The action of the drug may be selective against certain bacteria.

Antimicrobial stewardship Antimicrobial stewardship is a key component of a multifaceted approach to preventing emergence of antimicrobial resistance. Good antimicrobial stewardship involves selecting an appropriate drug and optimising its dose and duration to cure an infection while minimising toxicity and conditions for selection of resistant bacterial strains.

Antimicrobials An antimicrobial is a drug that selectively destroys or inhibits the growth of micro-organisms.

Bacteraemia The presence of bacteria in the bloodstream.

Catheter A tubular flexible device passed through body channels (e.g. artery, vein, or urethra) for the withdrawal or introduction of fluids.

Clostridium difficile A toxin producing bacterium which can cause severe diarrhoea or enterocolitis. This most commonly occurs following a course of antibiotics which has disturbed the normal bacterial flora of the patient's gut.

Enterobacteriaceae A family of Gram negative bacilli that contains many species of bacteria that normally inhabit the intestines. Enterobacteriaceae, that are commonly part of the normal intestinal tract flora, are referred to as coliforms.

Epidemiology The study of the incidence, spread, causes, and effects of diseases in defined populations. Epidemiology forms an evidence base which may inform policy decisions and targets for preventive healthcare.

HCAI An infection that was neither present nor incubating at the time of the patient's admission (normally seen more than 48 hours after admission to hospital).

Incidence The number of new events/episodes of a disease that occur in a population in a given time period.

Infection Invasion and multiplication of harmful microorganisms in body tissues.

One Health Collaborative multi-disciplinary work at local and national levels to attain optimal health for people, animals and the environment.

Pathogenic organisms Microorganisms that can cause disease in a host.

Surgery a procedure, where an incision is made (not just a needle puncture) with breach of mucosa and/or skin - not necessarily in the operating theatre.

Surgical site infection Surgical site infection can be defined as being present when pathogenic organisms multiply in a wound giving rise to local signs and symptoms, for example heat, redness, pain and swelling, and (in more serious cases) with systemic signs of fever or a raised white blood cell count. Infection in the surgical wound may prevent healing taking place so that the wound edges separate or it may cause an abscess to form in the deeper tissues.

Surveillance Systematic collection of data from the population at risk, identification of infections using consistent definitions, analysis of these data and dissemination of the results to those responsible for the care of the patients and to those responsible for implementation of prevention and central measures.