

# RESOLVING THE CRISIS OF ANTIBIOTIC RESISTANCE



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**At the June meeting of the Parliamentary and Scientific Committee, co-organised with the British Society for Antimicrobial Chemotherapy initiative (BSAC) Antibiotic Action, there was standing room only with some unable to gain access to the room. The magnitude of the response mirrored the concern of Parliamentarians and Stakeholders about antibiotic resistance and implications for the health of UK citizens.**

The introduction of antibiotics in the 1940s led to a revolution in health care, saving millions of lives around the world and facilitated modern day care of cancer patients, organ transplants and commonplace orthopaedic surgery such as knee and hip replacements. However, over the last decade there have been increasing numbers of infections in people by multidrug resistant Gram negative bacteria including *Escherichia coli* and *Klebsiella pneumoniae*. In parallel, there has been a reduction in the number of pharmaceutical companies producing new antibiotics, and the new drugs that have reached the patient have been predominantly those active against Gram positive bacteria such as MRSA. Together antibiotic resistance and lack of new antibiotics presents as serious a crisis to human health globally as the AIDs pandemic did in the 1980s and 1990s.

Antibiotic resistance knows no demographic or geographical boundaries and affects everyone, so raising awareness of the crisis of antibiotic resistance and lack of new antibiotics is extremely important. Dame Sally Davies,

the UK Chief Medical Officer, has done much since March 2013 and in her presentation on June 11th she outlined the size of the problem and the societal and financial costs to UK citizens and 'UK plc'. Indeed, antibiotic resistance is of such concern that she has called for the protection and preservation of the few antibiotics effective against bacteria by encouraging appropriate use of these valuable drugs. She also recommended the stimulation of development of new antibacterial treatments and further research to understand and track resistance.

solution to antibiotic resistance and as many multidrug resistant infections are by Gram negative bacteria, for which there are few useful drugs, action is required to stimulate the development of new treatments for such infections. Dr Richard Bax, who has a wealth of experience in antibacterial drug development in the pharmaceutical industry shared with the audience some of the reasons why 'big Pharma' have largely withdrawn from this product area. These include the high costs of development and uncertainties over regulatory success and obtaining a product licence. The regulatory

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Dr Nicholas Brown, President of BSAC, spoke about the effect that antibiotic resistance has upon the ability of doctors to treat bacterial infections effectively and showed how important antibiotics are to many specialist areas of medicine. He stated that having to use treatments comprising second or third choice antibacterial drugs is much less effective than is the first choice antibiotic for antibiotic-susceptible infections. He also discussed the issues of having to prescribe an antibiotic without knowing the bacterial species causing the infection and the impact of making the wrong choice thereby showing why following the Department of Health's 'Start Smart, then Focus' campaign for antibiotic prescribing is so important.

However, preserving antibiotics is only one part of the

requirements have been considered complicated, onerous and expensive and, moreover, difficult to achieve for antibacterial drugs. Current discussions at the European Medicines Agency and the USA Food and Drugs Administration about changes in the clinical trial paradigm will hopefully lead to new and clear guidelines so that the requisite studies to obtain a licence are feasible and not subject to change during the process.

Discussion was lively and covered several topics. It was clear to all that the problems are complex and the solutions are myriad so to do this at a global level requires partnerships between governments and various departments from health, to business, to overseas aid. While incentives to encourage the pharmaceutical industry to

invest in this area are important, without new entities entering the pipeline there will be nothing for Pharma to develop. In January, the World Economic Forum Global Risks Report 2013 indicated the magnitude of that global burden and placed antibiotic resistance on the global risks register. This information was based upon a handful of studies and is considered by all to represent an underestimate of the true burden. There needs to be action by all governments to increase funding for research into antibiotic resistance so that we can fully understand how it occurs, how it is spread and the magnitude of the true cost to Society. This information is essential if antibacterial discovery,

research and development is to find and produce new treatments. Academia and SMEs have much to offer in increasing understanding of antibiotic resistance and discovering new molecules and ways to combat bacterial infection. A dedicated funding mechanism for research will not only further the scientific base for understanding the biology of antibiotic resistance and facilitate drug development, but will also stimulate economic development.

As antibiotics are used widely in many settings, discouraging their use other than to treat infection is essential. This includes use where there is no bacterial infection and purchase of antibiotics by the general

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public, which is widespread in some countries. In addition, new ways to prevent and treat bacterial infections would be welcomed. It should be noted, however, that licensing of any new therapeutic, including phages are subject to the same regulatory processes as antibacterial drugs.

In the UK antibiotic resistance and lack of new treatments is recognised such that the UK has taken a global leadership role. Furthermore, support for addressing the issue crosses all political parties; following the P&SC meeting, on June 12th

there was the inaugural meeting of the All Party Parliamentary Group on Antibiotics, chaired by the Shadow Health Minister, Jamie Reed, MP. Kevin Barron MP is Deputy Chair, Zac Goldsmith MP is Treasurer and Baroness Masham is secretary. This APPG will provide cross-party parliamentarians a forum in which they can hear evidence, contribute to debate and identify solutions that the UK can offer to the Grand Challenge of antibiotic resistance and will further support delivery of the 2013 UK five year Antimicrobial Resistance Strategy 2013-2018.

## ANTIBIOTICS

Meeting of the Parliamentary and Scientific Committee on Tuesday 11th June

# THE SCIENTIFIC CHALLENGE POSED BY ANTIMICROBIAL RESISTANCE



Professor Dame Sally C Davies  
Chief Medical Officer

For over 150 years, Chief Medical Officers of the United Kingdom have produced annual reports on the state of the public's health. When I came to produce my annual reports, I



Dr Simon J Howard  
Public Health Specialty Registrar

chose to break with the precedent set by my recent predecessors and return to the historic format of an annual report in two parts, which I split into separate volumes. The first

volume serves a surveillance function, collating and presenting data on the public's health. The second volume provides a detailed examination of a major issue pertaining to public health. The topic examined in detail in my first annual report is infection, including the rise of antimicrobial resistance.

In a break from the approach of my predecessors, I brought together a collaboration of some of the foremost UK experts to advise on the topics which should be covered, and to write the individual chapters. These chapters informed my summary, and the recommendations I

made as Chief Medical Officer for England. The result is an authoritative summary of the current situation, which also reflects on the past and scans the future horizon. It includes explicit, actionable recommendations for named organisations, and outlines the scientific challenge posed by infections and antimicrobial resistance.

### SCALE OF SOCIETY'S RELIANCE ON ANTIBIOTICS

The size of the threat posed by antimicrobial resistance is underlined by the scale of

