Antimicrobial resistance (AMR) has the potential to affect everyone and it cannot be taken lightly. Drug resistant infections must be addressed as a priority, particularly in light of projections that 10 million people a year will die by 2050 if the problem isn’t tackled now.

On 21 September, the UN General Assembly gathered world leaders and made a commitment to work at national, regional, and global levels to address the growing threat of AMR. Representatives from 193 countries signed a declaration to ‘Act on AMR’, signalling a strong commitment to curb the global overuse of medicines to treat disease.

Many people fear that the AMR problem is going to end up like climate change. The issue of climate change was raised in the late 80s and early 90s, over the past 30 years it has been challenging to agree collective action. We are still in a position where many people doubt whether climate change is a real problem and if that’s the model that AMR is going to follow then we should all be worried.

To raise awareness of the issue, the Biochemical Society and the Microbiology Society collaborated to hold a panel discussion at the New Scientist Live event on Saturday 24 September 2016, which was attended by 600 people.

Laura Bowater, Senior Lecturer at the University of East Anglia, chaired a panel which included Anthony McDonnell, Head of Economic Research for the Prime Minister’s Review on Antimicrobial Resistance, Tamar Ghosh, lead on Nesta’s (http://www.nesta.org.uk) initiative – the Longitude Prize, to solve antibiotic resistance, and Caroline Barker, Honorary Senior Lecturer at University of East Anglia.

Barker opened the event presenting the clinicians’ perspective. “We are dependent on antibiotics for successful transplant procedures or to help cancer and arthritis patients”, she said. “So we need good effective antibiotics because when we start seeing problems with resistant bacteria it means that these patients are very much in danger”.

Through her 30 years of experience, Barker has seen that the NHS is dealing with more and more resistant microorganisms caused by overuse of antibiotics.

She outlined the key things that she believes are needed to tackle this problem:

- New, affordable drugs – as we are running out of effective antibiotics
- Different approaches to killing bacteria – e.g. using bacteriophages, viruses that kill bacteria, or looking at new ways of targeting the poisons that cause the disease process.

Next, McDonnell introduced his work for the Prime Minister’s Review on Antimicrobial Resistance. The Review was set up two years ago by the then Prime Minister, David Cameron, who appointed the economist Jim O’Neill to analyze the global problem of AMR and propose actions to tackle it internationally.

The team commissioned two multidisciplinary research teams from research institute RAND Europe and consultancy KPMG, each to provide their own assessments of the future impact of AMR, based on scenarios for rising drug resistance and economic growth to 2050. Their results project that if resistance is left unchecked, the loss of world output will get bigger through time, so by 2050, the world will be producing between 2 and 3.5% Gross Domestic Product (GDP) less than it otherwise would. Furthermore, 10 million more people would be expected to die every year than would be the case if resistance was kept to today’s level.

The second challenge was “How do you solve AMR?” which prompted 10 solutions:

- Public awareness
- Sanitation and hygiene
- Antibiotics in agriculture and the environment
- Vaccines and alternatives
- Surveillance
- Rapid diagnostics
- Human capital
- Drugs
- Global innovation fund
- International coalition for action

‘Tackling antimicrobial resistance on ten fronts’ by Review on Antimicrobial Resistance (https://amr-review.org/infographics) available under CC BY 4.0 license.
Ghosh then introduced the Longitude Prize, UK’s biggest science prize in field of rapid diagnostics for drug resistant infections.

In May 2014, 300 years after the original Longitude Prize, Astronomer Royal Lord Martin Rees, decided to revive it. The Longitude Committee shortlisted six challenges facing the world and the British public had the opportunity to vote for the one they thought should become the focus of Longitude Prize through BBC2’s Horizon programme and they chose AMR.

The vision of the Longitude Prize is to significantly reduce the overuse or misuse of antibiotics. Nesta decided to ask teams around the world to develop a transformative, point-of-care diagnostic test that will allow health professionals worldwide to administer the right antibiotics at the right time. The goal is to identify a test that is accurate, affordable, can be used anywhere in the world in any health system and needs to give a result in less than 30 minutes. So far, 205 teams in 39 countries are working towards this.

Presentations were followed by a panel discussion led by Laura Barker. Some key questions were:

What can we learn from the past?

Barker noted that: “There are important public health lessons to learn from the past. For example, we know that good sanitation improved recovery rates from infectious diseases and we know that immunization has helped prevent them.

There are things we can do, like not putting antibiotics into our food chain, and we need to make sure that all of our health professionals are up to speed with preventing these organisms spreading from patient to patient.

Public health, infection control, public understanding and public education are very important, because if we can prevent these infections from spreading then we won’t have to start throwing ever more antibiotics after the problem.

We are all responsible for our own health and adapting our behavior to prevent us from getting these infections is very important”.

Ghosh added: “We did some surveys to understand what the awareness is amongst the UK population. We found that 38% of the public still do not know that antibiotics are only effective for bacterial infections.

We really need to make sure that people know exactly when they should be taking them. So we need to change behaviors like:

- Buying antibiotics over the counter (outside the UK) or on the internet
- Sharing antibiotics
- Storing antibiotics ‘for the next time we get sick’”.

It seems that there is going to be a bigger problem in the poorer parts of the world, the developing nations. Do we really to worry about it here?

McDonnell said: “Yes we do! While it might be a bigger problem in India, it’s still going to be pretty terrible here.

We already lose 3000–4000 people from this in the UK every year. If that goes up to 30,000–40,000 or moves to children (because at the moment, it’s mostly people towards the end of their lives) then you will really start to notice it in the UK”.

Barker added: “Remember that with increasing global travel what happens to other parts of the world soon ends up in our backyard too.

Diseases don’t stay where they start, they travel the world. And a lot of multi-resistant organisms we’ve seen in clinical practice research recently have originated in India and China but ended up here. So we cannot just say that’s just somebody else’s problem, that problem is going to pitch up on our doorsteps sooner or later”.

Bowater reminded us that “It’s not just scientists and economists that are part of the solution, but everybody”. And summed up: “Solutions have to be happening on lot of different fronts in order to ameliorate the scenario of losing ten million people to antibiotic resistance in 2050. We shouldn’t just be relying on doctors to stop prescribing. We should be looking into pharma taking part to start thinking about getting better antibiotics and investing in production. We also now have a prize to look for better diagnostics and we need to do this because there is no point in pharma creating antibiotics if we are not looking after them properly when we get them. Finally, we have to rely on members of public to understand that antibiotics are an absolutely precious resource that we need to look after and that we are all responsible for”.

The take home message from the event was: “Be inspired! Go away, do your bit! AMR is in your hands!”

The Biochemical Society would like to thank our brilliant chair and speakers for taking part in this event, the New Scientist Live team and the Microbiology Society for hosting the debate.