World Health Day 2011: Combat drug resistance

Held in Brunei Darussalam on the 10th April 2011
Keynote lecture delivered by Dr Corrine Capuano, WHO representative for Brunei Darussalam, Malaysia and Singapore

INTRODUCTION

Since the discovery of penicillin in 1928 by Scottish Scientist and Nobel laureate Alexander Fleming, antimicrobials have been widely used to treat infectious diseases with beneficial outcomes and antimicrobials were hailed as miracle cures. However, with widespread use, some considered as inappropriate, this has led to the development of antimicrobial resistance (AMR). Drug resistance is becoming more severe and this can lead to prolonged and expensive treatment and greater risk of death.

‘The message on this World Health Day is loud and clear. The world is on the brink of losing these miracle cures,’ said World Health Organisation (WHO) Director-General Dr Margaret Chan. ‘In the absence of urgent corrective and protective actions, the world is heading towards a post-antibiotic era, in which many common infections will no longer have a cure and, once again, kill unabated.’

To address the issue of increasing AMR, the theme chosen for this World Health Day 2011 (14th April) is ‘Combat Drug Resistance. No action today, no cure tomorrow’ with the aim of increasing the awareness of this problem that we have to deal with from today onward to avert major problem in the future. In Brunei Darussalam, the World Health Day was celebrated on the 10th April with a symposium held in the capital with the Honourable Minister of Health, Yang Berhormat Pehin Orang Kaya Johan Pahlawan Dato Seri Setia Awang Haji Adanan bin Begawan Pehin Siraja Khatib Dato Seri Setia Awang
Haji Mohd Yusof as the guest of honour. The keynote lecture for the symposium was delivered by Dr Corrine Capuano, WHO representative for Brunei Darussalam, Malaysia and Singapore. This report summarises the key components of the lecture.

Why AMR is a global concern?

AMR is a global challenge for several reasons as listed by Dr Capuano (Table 1)

**Table 1: Concerns of AMR.**

- Antimicrobial resistance (AMR) kills
- Challenges care and control of infectious diseases
- Greatly increases health care cost
- Threatens a return to the pre-antibiotic era
- Jeopardises healthcare gains for individual and society
- Compromises health security, damages trade and economy
- Lack of coherent approaches to prevent and containment

She highlighted the problem of increasing resistance with some of the common infectious diseases. Annually, there are 440,000 new multi-drug resistant (MDR) tuberculosis cases and as of today extensively drug resistant (XDR) cases is now reported in 69 countries. Eighty five percent of the MDR cases are accounted for by 27 countries, mostly in the Asia and Eastern Europe region (Figure 1). Based on 2008 estimates, South-east Asia accounted for 30% (130,000 cases) of the worldwide MDR cases, followed by Western Pacific (28%), Europe (19%, mainly Eastern Europe) and Africa (18%).

Emergence of Artemisinin resistant *Falciparum malaria* seen in the Indochina region is linked to the ongoing use of monotherapies. This is a major concern given that Artemisinin is the last line of treatment, and combination therapy is recommended.

Other infections highlighted included the ongoing problem with Methacillin resistant *Staphylococcus aureus* (MRSA), highly resistant *Escherichia coli* (fluorquinolones and 3rd generation cephalosporin) in Europe, and the emergence of NDM-1 producing *Enterobacteriaceae* strains in United Kingdom, India and Pakistan. Other issues touched upon included the concern with drugs resistance related to treatment of Human Immune Deficiency (HIV) infections where combinations of multiple antiviral are used.
Emergence of AMR as highlighted can lead to treatment failure, prolonged hospital stay and increase risk of death.

Dr Capuano also briefly touched on the problem with antimicrobials development. Out of a 100 compound discovered and being tested as potential antimicrobial, through pre-clinical to clinical phases, only one may actually lead to the development of a new agent. This usually cost hundreds of millions of dollars and years of development.

The challenge of AMR in other areas

Food production: Surprisingly, about half of all the antibiotics produced are actually for used in farming, a fact that most of us are not aware of. Dr Capuano also stated that 50% of human antimicrobial resistance is caused by the use of antimicrobials as livestock growth promoters.

Medicines (ir)rational use: Between 25 to 75% of antibiotic prescriptions are considered inappropriate. The practice of empiric treatment (i.e. self-limiting flu like illness with antibiotic), lack of diagnostic services and lack of targeted education are some of the factors contributing to inappropriate use. Furthermore, in some countries, antimicrobials can be purchased from community pharmacies without prescription. Currently, only 102 countries surveyed by WHO, including Brunei Darussalam regulate drug promotion.

The cost of AMR

The cost of AMR is significant. Management of AMR requires additional investigations, additional treatments, longer hospital stay, longer time off work, reduced quality of life, greater likelihood of death and also impacts on wider society (health and economic). Costs of dealing with AMR such as outbreaks of MRSA treatment of MDR or XDR tuberculosis can be significant. However, there are other costs, not just to the health care system.

What drives AMR?

There are many factors that drive AMR and those discussed by Dr Capuano are listed in Table 2.

Dr Capuano also went on to discuss some of the problems that lead to selective pressure driving the development of AMR and dissemination of resistant organisms. Inappropriate antimicrobial choice, use of a narrow repertoire of antimicrobials on most patients, antimicrobial misuse and use of poor quality antimicrobials are some of the factors that leads to AMR. Factors that promote disseminations of resistant organisms include inadequate infection control, shortfalls in hygiene, sanitation, and public health and lack of surveillance and consequent late detection of AMR.

Global and Regional response to AMR

The policy steps recommended by WHO in response to the increasing AMR is shown in Table 2: Factors that drives AMR shown in

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<th>Table 2: Factors that drives AMR development.</th>
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<td>• Plans and resources not comprehensive or coherent, poor accountability</td>
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<td>• Consumers and communities not engaged</td>
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<td>• Surveillance systems weak or absent</td>
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<td>• Systems for ensuring quality and supply of medicines inadequate</td>
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<td>• Use of medicine inappropriate and irrational, including in animal husbandry</td>
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<td>• Antimicrobials and diagnostic arsenal limited</td>
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<td>• Research and development for diagnostic and medicine insufficient</td>
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Table 3: Policy steps recommended by the World Health Organisation.

- Develop and commit to a comprehensive, financed national plan with accountability and civil society engagement
- Strengthen surveillance and laboratory capacity
- Ensure uninterrupted access to essential medicine of assured quality
- Regulate and promote rational use of medicine, including in animal husbandry, and ensure proper patient care
- Enhance infection prevention and control
- Foster innovations and research and development for new tools

Table 3.

What’s blocking us?

There are many barriers that need to be addressed in order for us to deal with the issue of increasing AMR. Apart from those Dr Capuano has already mentioned, there are other obstacles.

Dr Capuano stated that such a complex problem as AMR requires a comprehensive response among and between member states across different sectors. Actions need to be clear. However, there is often failure of commitment, implementation and accountability. Finally, while preventing AMR is a ‘public good’ which strengthens health security, often there is problem of inadequate financing.

World Health Day 2011: What needs to be achieved.

Dr Capuano highlighted that the goal of World Health Day 2011 is the need to save lives and protect health by keeping precious, lifesaving medicines effective and useful to combat infectious diseases. We must continue to raise awareness on what drives the development of AMR and build our commitment for effective policies and practices and implementation to combat the increasing problem of AMR.

Finally, Dr Capuano stressed that the World Health Day 2011 awareness MUST lead to:

- Coherent statement of commitment across stakeholders and by key constituencies
- Comprehensive, financed national plans and clearer accountability
- New national, regional and global initiatives, such as collaboration across AMR surveillance networks
- Coordinated Non-Government Organisations (NGO) action
- Sustained information campaigns
- Incentives for more Research and Development (R&D) for new diagnostics and medicines

Summary

As highlighted by Dr Capuano, AMR is a global problem. It is commonly due to irrational or inappropriate antimicrobial use. We are fortunate that AMR is not a major problem in our local setting as compared to other countries such as Singapore as highlighted by Dr Brenda Ang. In Singapore, antimicrobial stewardship programmes have been implemented to manage the problems of AMR. Although our infections control measures are not as comprehensive as some countries, we have been able to keep the problem of MRSA under control. However, the emergence of multi-resistant Acinetobacter baumannii is a concern. In the last few years, we have only encountered a single case of MDR tuberculosis and this was an imported case. This patient had originated form the Indian Subcontinent. Fortunately the total number of HIV cases encountered in our local setting has remained low.
In order to prevent or control AMR, we must all work together. This includes the various parties within the healthcare system to other government and non-government agencies. We must not forget about the patients who are usually the ones who will suffer the consequence of our failures. Education is important not just for the healthcare workers but also for the general public. Measures as suggested by WHO need to be implemented and supported with full commitment by respective agencies. Monitoring system for the development of AMR and outbreaks must be in place. To achieve the goals set out by WHO, we all need to play our part.

Speakers:
1: Dr Corrine Capuano, WHO Representative for Brunei, Malaysia and Singapore– Keynote Lecture– Combat drug resistance.
2: Dr Brenda Ang, Senior Consultant Infectious Diseases, Tan Tock Seng Hospital, Singapore– Antimicrobial Stewardship.
3: Dato Paduka Mr Samuel Yapp Kai San, Chairmen of the Infection Control, RIPAS Hospital– Glimpses of infection control at RIPAS Hospital.
4: Dr Luke Mathew, Consultant Respiratory Physician, RIPAS Hospital– Multi drug resistant Tuberculosis: Emergence, impact and implications.