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### *Antimicrobial Resistance (AMR)*

## **Superbug: Time for ASEAN Collective Action**

*By Christopher H Lim, Jorgen Schlundt and Vincent Mack*

### **Synopsis**

*The mutation of microorganisms has reached the point of no return. This is an opportune time for ASEAN to lead the world in the fight against antimicrobial resistance before it is too late.*

### **Commentary**

ASEAN'S 50th anniversary is an opportune time for the grouping to pursue regional initiatives for public goods. The economic integration of ASEAN and the increased policy attention to inclusive growth of ASEAN should be accompanied by stronger actions for the broader well-being of the ASEAN population and the community at large.

One of these issues is the emerging danger of infections arising from mutated bacteria or Superbug. The United Nations, the World Health Organisation (WHO) and the Davos World Economic Forum have constantly – but especially over the latest two years - alerted the global community to this. Due to the poor antibiotic stewardship in the last few decades, most countries are now way behind the mutation curve in combating the Superbug in the development of new drugs.

### **What is the Superbug?**

Following the invention of antibiotics in early 1940s, these medications have been used in humans for treatment and prevention of bacterial infections. Initially, antibiotics were administered to livestock for therapeutic purposes.

With the increase in factory farming, antibiotics were added to animal feed around 1950 to enhance growth rate of livestock. Over time, such practice is found almost globally. Currently, of the estimated 70% of all antibiotics administered for livestock, the bulk are for non-therapeutic purposes (this practice has been banned in the European Union since 2006).

Even as a waste product, these antibiotics retain most of their potency as around 80-90% of all antibiotics ingested by both humans and livestock are not broken down in the passage through the body and enter the environment as waste. They are also able to affect bacteria and promote antibiotic resistance even after they enter the soil or water.

The aggressive and extensive use of antibiotics, over time, in both human and livestock creates mutation in bacteria and other microbes, leading to the elimination of the effectiveness of drugs to cure or prevent infections. This mutation is known as antimicrobial resistance, AMR or commonly described as the Superbug.

### **Be Mindful of the Superbug**

Antimicrobial resistant genes have penetrated the bacterial population in the spheres where antibiotics are used--in hospitals, farms and aquaculture. The Superbug is taking root everywhere in the world today, compromising our ability to treat infectious diseases, as well as undermining many other advances in health and medicine.

Without effective antimicrobials for treatment and prevention of infections, one's immunity will be compromised. Infections from surgical procedures such as transplants, caesarean sections or hip replacements and infection in immunocompromised patients following chemotherapy for cancer treatment, will likely result in prolonged illness, disability, and death.

While dangerous, the slow and steady march of antibiotic resistance does not cause people to bleed to death in the streets, the way Ebola virus does; neither does it cause heart-rending birth defects, the way Zika virus does. The slow speed of this catastrophe could perhaps indirectly create a false sense of security.

In short, both humans and livestock farming are in danger; and the issues of food security and safety are called into question.

### **ASEAN Should Act On AMR**

AMR is a global problem that cannot be contained nationally or regionally -- universal adoption is the ultimate goal. With this in mind, we urge ASEAN leaders to start and commit to a multi-year, multi-front concrete collective plan against AMR before ASEAN is severely affected by the flood of AMR:

#### *Individual Member State Level*

All Member States of ASEAN should introduce immediate measures to educate residents on the importance of personal health. Also important is having a long-term

public health education drive, boosted with a champion on infection prevention and control. The aim is to minimise the need for antibiotics and identify alternative approaches such as vaccination (e.g. against pneumococcal infections, cholera, and typhoid fever).

Simultaneously, all ASEAN Member States should introduce national farmer education to ensure all farmers are well informed on the consequences of the emergence of AMR for both humans and animals. In parallel, all ASEAN Member States should pass legislation and enforcement to control antibiotic use and sales, and provide access to clean water and sanitation.

#### *Dual-surveillance system*

Given the close and frequent movements of people and food within ASEAN, and the mobility of mutated microbes from bacterium to bacterium, all ASEAN Member States could undertake and implement AMR monitoring at individual Member State level & ASEAN wide.

For the action plan against AMR to be effective, we need to move beyond individual national action plans to pursue a pan-ASEAN surveillance system for AMR monitoring. With the proliferation of the Next-Generation Sequencing methodology in the regional labs, this proposed surveillance system contains a regional database of all DNA sequences for AMR microorganisms, with data sharing protocols to facilitate data consolidation at the ASEAN level. This will enable tracking of outbreaks and to track the spread of diseases and AMR in real-time.

#### *Minimum Information for surveillance*

To have an effective outbreak tracking and source tracing, it is crucial for ASEAN policymakers to be able to track down to the level of individual hospitals or farms at specific sites. In addition, information such as the rate of mutation of microbes will be critical to enable policymakers to establish a baseline to assess efficacy and track progress of policy interventions.

#### *Purpose of the Surveillance System*

With this system in place, ASEAN should provide regular progress reports on the status of AMR in ASEAN to enable evidence-based decision-making at both member state and pan-ASEAN levels.

#### *Minimum Standards*

The regional grouping should also create an ASEAN Food Safety Standard for levels of antimicrobial resistance in food production as well as adhere to common internationally-acceptable medical protocol for the administering of antibiotics for humans. Antibiotics should not be used to treat viral infections -- because they only work on bacteria.

Such regional measure is by no means trivial as this will be the first of its kind globally.

Currently, even within the European Union, AMR surveillance system is only conducted at the individual country level.

## **Beyond ASEAN**

To safeguard the personal health and safety of individual ASEAN citizens as well as the food safety and security of ASEAN collectively, including the well-being of animal farms and agriculture, ASEAN should pursue a common stance to secure the commitment and cooperation of its major trading partners Australia, China, India, Japan, Korea and New Zealand.

As part of the global community, ASEAN should work in parallel to limit the usage of antibiotics in both humans and farms; and commit to share information gathered in different countries relating to antimicrobial resistance.

Hence, this database could also be scaled up to the global level, and protocols could be designed to allow DNA data to be dovetailed with a global database of DNA sequences for microorganisms to enhance global public health and food safety.

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