立法會
Legislative Council

LC Paper No. CB(2)1843/16-17(01)

Ref : CB2/PL/HS

Panel on Health Services

Information note prepared by the Legislative Council Secretariat for the meeting on 17 July 2017

Hong Kong strategy and action plan on antimicrobial resistance

Antimicrobial agents, including antibiotics, are drugs that can kill or suppress disease-causing microorganisms (such as bacteria, fungi, viruses and parasites). Antibiotics are medication used for treating bacterial infections, either by killing the bacteria or stopping them from growing. There are different types of antibiotics for treating different bacterial infections.

2. Antimicrobial resistance ("AMR") happens when microorganisms resist previously effective antimicrobials. When antibiotics wipe out disease-causing bacteria in our body, normal bacteria are also killed, thereby increasing the opportunity for resistant bacteria to grow and multiply. These resistant bacteria are sometimes referred to as "superbugs". Some superbugs are capable of resisting more than one antibiotic and such infections are difficult to treat. Although there may be alternative antibiotics available, they may be less effective or cause more side effects. If the problem of AMR does not improve, there would be fewer effective treatment options.

3. The World Health Organization ("WHO") has identified AMR as a global public health threat. According to WHO's first global report on AMR surveillance released in 2014, resistance to common bacteria is reaching very high levels with few effective treatment options. To strengthen containment efforts in the Western Pacific Region, the Sixty-fifth session of the WHO Regional Committee for the Western Pacific endorsed an Action Agenda for AMR in Western Pacific Region in October 2014.[1] In May 2015, the

[1] The Action Agenda for AMR in Western Pacific Region can be accessed at the WHO website (http://www.wpro.who.int/entity/drug_resistance/documents/action_agenda.pdf).

Sixty-eighth session of the World Health Assembly[2] adopted a Global Action Plan on AMR[3]. It is expected that countries will develop their own action plans on AMR in line with the Global Action Plan. These two documents of WHO both emphasize the importance of adopting a "One-Health" approach in formulating and implementing strategies to combat AMR. The One Health concept is based on the recognition that the health of humans is connected to that of animals and the environment and that AMR must be tackled at all three levels. It calls for collaborative actions to be taken by different sectors including, among others, human and veterinary medicine, agriculture, food, environment, pharmaceutical industry and well-informed consumers.

4. Locally, to combat the threat posed by AMR to the public health, it was announced in the 2016 Policy Address the setting up of a High Level Steering Committee on Antimicrobial Resistance ("the Steering Committee") to formulate strategies and action plans in this regard. Chaired by the Secretary for Food and Health, the Steering Committee comprises representatives from relevant Government departments, public and private hospitals, healthcare organizations, academia and relevant professional bodies. Under the Steering Committee, an Expert Committee on Antimicrobial Resistance ("Expert Committee") was established to provide expert opinions on priority areas for actions against AMR under the "One-Health" framework.

5. On 23 June 2017, the Steering Committee endorsed in principle the Hong Kong Strategy and Action Plan on AMR ("the Action Plan") to tackle the threat of AMR to public health and related issues in Hong Kong as proposed by the Expert Committee. Based on the Global Action Plan of WHO and with reference to the experience of other jurisdictions, the Action Plan identifies the following six key areas to slow the emergence of AMR and prevent its spread:

(a) strengthen knowledge through surveillance and research;

(b) optimize use of antimicrobials in humans and animals;

(c) reduce incidence of infection through effective sanitation, hygiene and preventive measures;

(d) improve awareness and understanding of AMR through effective communication, education and training;

(e) promote research on AMR; and

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[2] The World Health Assembly is the decision-making body of WHO.

[3] The Global Action Plan on AMR can be accessed at the WHO website (http://www.wpro.who.int/entity/drug_resistance/resources/global_action_plan_eng.pdf).

(f) strengthen partnership and foster engagement of relevant stakeholders.

On 10 July 2017, the Administration launched the Action Plan (2017-2022). According to the Administration, the Steering Committee will conduct mid-term and final reviews on the actions proposed within the five-year period of the Action Plan.

6. Separately, a written question on the control of AMR problem was raised at the Council meeting of 29 June 2016. The question and the Administration's reply are in the **Appendix**.

7. The Administration will brief the Panel on the Action Plan on 17 July 2017.

Council Business Division 2
Legislative Council Secretariat
14 July 2017

LCQ17: Control of antimicrobial resistance problem
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Following is a question by the Hon Ip Kwok-him and a written reply by the Secretary for Food and Health, Dr Ko Wing-man, in the Legislative Council today (June 29):

Question:

It has been reported that a research report published earlier on in the United Kingdom has pointed out that the abusive use of antibiotics by humans has led to the emergence of a variety of antibiotic-resistant bacteria, and it is estimated that 10 million people will die from diseases caused by such kind of bacteria each year by 2050. In addition, it has been reported that the number of cases of locally acquired carbapenemase-producing enterobacteriaceae received by public hospitals during the first 10 months of last year soared by nine times when compared with the figure in 2013. In this connection, will the Government inform this Council:

(1) whether it knows the number of patients confirmed to have been infected with antibiotic-resistant bacteria in public hospitals in each of the past three years, and the number of such patients who subsequently died from related diseases; whether the Hospital Authority (HA) has examined the channels through which such patients were infected in the hospitals; if the HA has, of the findings; if not, the reasons for that;

(2) of the measures and guidelines currently put in place by the HA to prevent patients from being infected with antibiotic-resistant bacteria in public hospitals, as well as the effectiveness of the same; whether, in view of the upward trend of such kind of cases, the authorities will consider increasing manpower to step up infection control and ward cleaning work (such as changing bed linens and curtains more frequently);

(3) whether the authorities, in planning the construction of new hospitals and the redevelopment of existing hospitals, have dedicated efforts on various fronts, such as building design, environment and staff establishment of the hospitals concerned, so as to reduce the risks of antibiotic-resistant bacteria growing and spreading in public hospitals; if they have, of the details; if not, the reasons for that;

(4) as a bacterium which is resistant to all existing antibiotics or antimicrobial drugs has been found earlier in the United States, whether the authorities have studied the possibility of such bacterium being found in Hong Kong, as well as the authorities' counter-measures should such a situation arise; and

(5) whether the authorities have currently put in place any mechanism to detect if the imported livestock and fish for human consumption have been fed with excessive antibiotics; if they have, of the number of such cases uncovered in each of the past three years, and the follow-up actions taken by the authorities; if not, the reasons for that?

Reply:

President,

Antimicrobial resistance is a major public health issue in the world. In this connection, the Government set up the High-level Steering Committee on Antimicrobial Resistance (Steering

Committee), chaired by the Secretary for Food and Health, in June 2016 to tackle the threat of antimicrobial resistance to public health.

To successfully control the problem of antimicrobial resistance, different stakeholders including the general public are required to work together in partnership in a complementary and coordinated manner. To this end, the Steering Committee comprises representatives from relevant Government departments, public and private hospitals, healthcare organisations, academia and relevant professional bodies. Under the "one health" framework, the Steering Committee will formulate strategies and implement action plans to combat antimicrobial resistance from various aspects.

In consultation with the Hospital Authority (HA), the Department of Health, the Agriculture, Fisheries and Conservation Department (AFCD) and the Food and Environmental Hygiene Department (FEHD), our reply is as follows:

(1) Multi-drug resistant organisms (MDROs) found in public hospitals include Methicillin-resistant Staphylococcus aureus, extended-spectrum beta-lactamase producing organisms, Vancomycin-resistant Enterococcus, multi-drug resistant Acinetobacter, multi-drug resistant Pseudomonas aeruginosa and Carbapenemase-producing Enterobacteriaceae. The HA normally uses antibiotic resistance rate (i.e. the ratio of organisms showing antibiotic resistance) to indicate the situation of MDROs in public hospitals. The Annex lists the antibiotic resistance rates of major MDROs.

The HA does not maintain statistical information on the number of fatal cases due to MDRO infection and the modes of transmission of MDROs.

(2) The HA has drawn up relevant guidelines on various MDROs, which mainly adopt the strategy of "screening and isolation" and use a multi-pronged approach to prevent patients from MDRO infection in public hospitals:

(a) Active screening: Collecting samples from hospitalised patients at risk for MDRO screening having regard to the risk factors of the patients;

(b) Isolating patients according to their risks: Isolating patients with MDROs to prevent transmission to other patients;

(c) Maintaining environmental hygiene:

(i) Implementing environmental cleaning guidelines and stepping up the cleaning of medical areas where patients with MDROs stay;

(ii) Dedicating patient-care items (such as stethoscopes and blood pressure cuffs) to patients with MDROs to prevent cross-infection; and

(iii) Changing the bedside curtains more frequently;

(d) Promoting the importance of hand hygiene: Regularly checking whether healthcare staff have observed hand hygiene, and promoting personal hygiene among patients, especially on the importance of keeping hands clean before eating and taking medication, and after using toilet. Moreover, skin disinfectant would be used to clean the body of needy patients in high-risk wards; and

(e) Implementing the Antibiotic Stewardship Programme: Promoting reasonable and proper use of antibiotics, checking whether doctors have followed the established guidelines when prescribing

"big guns" antibiotics, and providing relevant training for frontline doctors.

(3) In planning and redeveloping public hospitals, the HA will ensure that the distribution of beds and the space between beds are in compliance with the established guidelines on infection control to prevent cross-infection. In addition, the HA, in planning and redeveloping public hospitals, is working towards the direction of expanding ward space, increasing space between beds and providing toilets in each ward in project design so as to reduce the risk of infectious disease transmission in wards and improve ward environment.

(4) The mcr-1 gene, which was first reported in the Mainland, has now been found in many countries and regions. Some local case reviews have also found individual samples containing mcr-1 gene.

According to the information provided by the Centres for Disease Control and Prevention of the United States and relevant studies, E.coli containing the mcr-1 gene was found in the urine sample of a patient in Pennsylvania in May this year, and this was the first case of its kind in the country. Bacteria containing the mcr-1 gene will develop resistance to colistin, and this gene can be transferred between bacteria more easily than before. That said, the health authority of the United States confirmed that the bacteria was not resistant to all antibiotics and could be effectively treated by certain classes of antibiotics. Nevertheless, as mcr-1 gene can easily be transferred between bacteria, if it is transferred to those bacteria that have already developed resistance to certain drugs, infections caused by such bacteria may become untreatable.

With the increasing prevalence of MDROs, the use of colistin in hospitals will become more frequent. If the transfer of mcr-1 gene takes place in Hong Kong, its potential impacts on local public health must not be overlooked. The relevant authority will closely monitor the situation and seek advice from the Expert Committee on Antimicrobial Resistance under the Steering Committee as appropriate, with a view to devising effective strategies and counter-measures.

(5) In rearing food animals, rational use of antibiotics for treatment purpose is commonly accepted. According to the Food and Agriculture Organization of the United Nations, prudent use of veterinary drugs including antibiotics has tremendous benefits to animal health, and judicious use of antibiotics in livestock farming can reduce the emergence and spread of resistant bacteria in food animals, thus minimising public health risks.

The Government closely monitors the livestock and fish supplied to the local market, whether locally reared or imported, to ensure they are compliant with Hong Kong's statutory requirements and are fit for human consumption. The level of chemical and veterinary drug residues in food animals is governed by the Public Health (Animals and Birds) (Chemical Residues) Regulation (Cap.139N), which sets out the chemicals prohibited and regulated in Hong Kong, including antibiotics.

For locally reared livestock and fish, the Government takes samples for testing at three levels, namely livestock and fish farms, slaughtering plants and retail outlets, on a regular basis according to the level of risk assessed. The AFCD conducts regular inspections at livestock and fish farms, and from time to time provides farmers with information on the proper use of antibiotics through talks, leaflets and publications. So far the AFCD has not detected abusive use of antibiotics in livestock and fish farms in Hong Kong.

All live poultry or livestock imported into Hong Kong are

supplied by registered Mainland farms, with health certificates attesting that the imports are free of prohibited chemicals and do not carry residue of controlled chemicals exceeding the statutory limits. From 2011 to 2015, over 260 000 urine and tissue samples of local and imported food animals were taken at local slaughterhouses and tested for residue of chemicals and veterinary drugs (including antibiotics). Prohibited chemical was found in one sample. Another eight samples were found to have antibiotics residue exceeding the maximum statutory level. Aside from announcing the incidents, the Government has followed up with the farms, including tightening up surveillance on, and providing technical support to, the concerned farms. One pig farm was prosecuted.

The Centre for Food Safety (CFS) of the FEHD takes food samples at import, wholesale and retail levels for chemical testing (including antibiotics testing) under its Food Surveillance Programme. From 2011 to 2015, more than 12 400 samples of meat, poultry and aquatic products were taken for testing of the antibiotic residue level. Apart from the abovementioned eight samples with antibiotics exceeding the maximum statutory concentration levels, all other samples were found to be compliant with the statutory requirements. After announcement of the test results, CFS has followed up the non-compliant cases, including tracing the food sources, prosecuting the importers concerned, banning importation of similar food products by the same exporters and stepping up sampling and testing.

Ends/Wednesday, June 29, 2016
Issued at HKT 17:36

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LCQ 17 Annex

Antibiotic resistance rates of major multi-drug resistant organisms

Multi-drug resistant organisms	**Antibiotic resistance rates**		
	2013	**2014**	**2015**
Methicillin-resistant Staphylococcus aureus[*]	46.3%	45.7%	46.1%
Extended-spectrum beta-lactamase producing organisms[*]	23.9%	23.3%	23.2%
Multi-drug resistant Acinetobacter [*]	18.6%	24.9%	15.9%
Vancomycin-resistant Enterococcus *	1.26%	0.74%	0.25%
Multi-drug resistant Pseudomonas aeruginosa[*]	0.09%	0.06%	0.02%
Carbapenemase-producing Enterobacteriaceae [#]	0.03%	0.10%	0.12%

[*] Source: Clinical Data Analysis and Reporting System of Hospital Authority

[#] Source: Reports from infection control teams of public hospitals. The antibiotic resistance rate is based on the Escherichia coli and Klebsiella species isolated from clinical samples.