Key Area 3

Reduce incidence of infection through effective sanitation, hygiene and preventive measures

Objective 8

Strengthen infection prevention and control measures in healthcare settings

Objective 9

Strengthen infection control training for healthcare workers

Objective 10

Develop and strengthen infection prevention and control programmes in veterinary settings and along food supply chain

Objective 11

Develop and strengthen surveillance and interventions to combat antimicrobial resistance in food

Objective 12

Enhance vaccination uptake

49. AMR can arise naturally and can be an inevitable consequence of antimicrobial use. Various infection control measures, such as hand hygiene and environmental hygiene, has been proven to significantly reduce the risk of infections, which in turn reduces the need for antimicrobial prescription. Nevertheless, suboptimal infection control measures further promote the emergence and spread of AMR.

50. The same principle applies to the animal health sector, where good farm management and biosecurity can contribute tremendously to the reduction of susceptibility to infections and the need for antimicrobial use in animals.

51. The local farm animal problem is not very significant in Hong Kong as they constitute a minority of the food supply in Hong Kong. On the contrary, the issue of AMR in ready-to-eat food, including those imported to Hong Kong, have more significant impact. Monitoring of the AMR bacteria inside such food items, with regular promulgation of the findings and the education of the trade and public on the potential health implications of acquisition of AMR from ready-to-eat food should be strengthened.

Objective 8 - Strengthen infection prevention and control measures in healthcare settings

52. Infection control programmes usually encompass promotional activities on hand hygiene, environmental hygiene, equipment disinfection and sterilisation, and are supplemented by proper use of personal protective equipment and isolation of infectious cases. Outbreak management, including prompt case detection, isolation, contact tracing and quarantine are especially relevant in preventing and controlling spread of AMR.

53. Infection Control Branch of CHP has been the major coordinating body for AMR infection control in human health in Hong Kong. CHP has been working with HA on hospital outbreak control, guidelines formulation and infection control training.

Infection control measures in public and private hospitals

54. HA set up a Task Force on Infection Control to oversee infection control policy of public hospitals at corporate level. Each HA hospital has an infection control team to oversee the policy and implementation of infection control programmes. Each team usually consists of doctors and a team of infection control nurses (ICNs). The manpower ratio of one ICN per 250 hospital beds has been adopted in hospitals, but there is a growing challenge on the staffing requirement as a result of the expanding scope of the hospital infection control programmes. The infection control teams are also responsible for surveillance, audit and implementation of infection control and training programmes. Frontline staff has also been involved as link-nurses to build a culture where ‘infection control is everybody’s business’.

55. HA provides mandatory basic infection control training for newly recruited healthcare workers and refresher training every 24 months for current staff. Further specific, dedicated and advanced-level training is offered based on work nature, and is centrally coordinated by HA Infectious Disease Control Training Centre. A five-year infection disease and infection control training plan starting in 2022 has been formulated.

56. Adequate bed spacing and conducive ward design is one of the essential elements to facilitate the proper implementation of infection control measures and isolation precautions. Overcrowding is considered one of the important factors that impede the successful implementation of an infection control programme. From an infection control perspective, four- to six-bed cubicles with physical electrical doors (either foot operated or automatic) and built-in toilets with the provision of hand-washing facilities are recommended by EC in general wards of newly built HA hospitals. Currently, ensuite toilet/shower facilities and hand-washing facilities are provided in HA hospitals, however, doors are not usually provided in multi-bed settings due to practical reasons.

57. Each private hospital has an infection control team to oversee policy and implementation of infection control programmes. CHP has set up a Working Group of Collaboration between CHP and Private Hospitals on Safe Use of Antibiotics and Infection Control to cultivate skills, information and experience sharing.

58. Hand hygiene by healthcare workers is often considered the single most important infection control measure in healthcare settings. Hand hygiene is one of the top infection control priority areas in HA hospitals. Apart from promoting and strictly enforcing WHO's Five Moments for Hand Hygiene for healthcare workers, the involvement of patients and relatives is also being pursued. The hand hygiene compliance as reflected by HA's unannounced audit has remained stable at around 90% in the recent 5 years.

Hand hygiene and other prevention programmes under the Department of Health

59. In DH, trainings and audits on hand hygiene measures are conducted on a regular basis. Infection Control coordinators are identified to use audit tools to ensure compliance with infection control standards. DH also issues and regularly updates guidelines on prevention of communicable diseases to RCHEs and Residential Care Homes for Persons with Disabilities (RCHDs). Integrated assessment of RCHEs is being conducted by DH annually.

60. Hand hygiene was being promoted extensively in community settings, through WHO's annual Hand Hygiene Day, hand hygiene posters in public washrooms, clinics and wards, television advertisements and specific programmes targeting high-risk groups such as schools and RCHEs.

61. Apart from healthcare workers, patients also play an important role in infection control. Since 2009, WHO has been advocating patient empowerment in healthcare settings. WHO defines empowerment as a process through which people gain greater control over decisions and actions affecting their health and should be seen as both an individual and a community process[25]. Through different health promotions and patient engagement programmes, both DH and HA have been actively engaging members of the public and patients on the importance of hand hygiene and their roles in reminding healthcare workers to clean their hands.

Management of MDROs in RCHEs

62. The prevalence of MDROs in RCHEs was on a worrying trend. For example, the prevalence of MRSA colonisation among RCHE residents experienced a more-than-10-fold increase between 2005 and 2017, from 2.8% to 37.9% (**Figure 5**); a more-than-10-fold rise of CPE cases in RCHE residents were reported from 2016 to 2021 (**Figure 6**). These trends are alarming, since they occurred despite the previous 5-year Action Plan.

Figure 5: Prevalence of MRSA colonisation among RCHE residents, 2005 to 2017 [26,27,28,29]

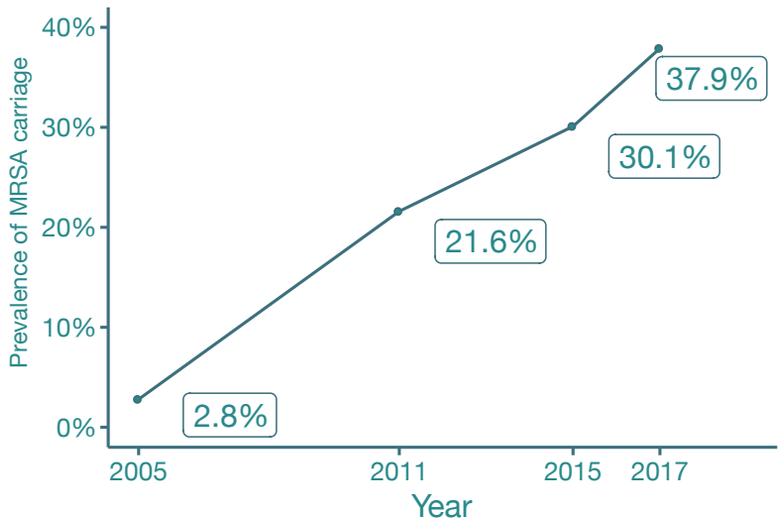
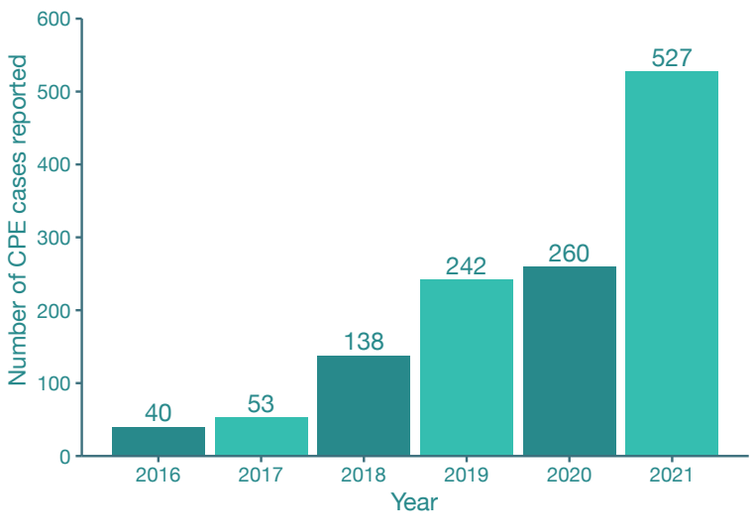


Figure 6: Number of CPE cases involving RCHE residents reported to CHP, 2016 to 2021



63. MDROs colonisation in RCHE residents was associated with prolonged hospitalisations as well as increased risks of morbidity and mortality[30,31],which resulted in a vicious cycle of transmission between the RCHE and the hospital. To address the MDRO situation, synergistic measures in both RCHEs and hospitals are necessary.

64. Currently, there is established workflow between CHP and HA for managing MDROs in RCHE. Upon identification of an inpatient MDRO case or carrier involving RCHE resident, HA will notify CHP which will conduct risk assessment and implement relevant control measures in the RCHE, including infection control advice, site visit, and contact tracing if required. CHP also issued guidelines on infection control and management of MDRO carriers to RCHEs and conducted visits to RCHE to provide assessment and support on infection control measures.

65. In view of the apparent lack of effect of the above measures, based on EC's recommendations, a pilot programme on universal decolonisation for MDRO carriers in about 150 RCHEs under the catchment areas of Queen Mary Hospital and Queen Elizabeth Hospital was started in September 2021. The decolonisation regimen comprised of 2% chlorhexidine gluconate solution for bathing, and application of 10% povidone iodine ointment to nostrils once daily two times per week, which was found to be effective in a previous study[32]. Admission MDRO screening and decolonisation therapy of RCHE residents were also implemented at the two public hospitals. Preliminary evaluation revealed a statistically significant reduction in positive rate for MRSA in the RCHE environment and a slight reduction of MRSA colonisation proportion upon admission screening. Nevertheless, with the waves of COVID-19 experienced in Hong Kong, the outcome of this pilot programme is uncertain and results will need to be interpreted with caution. The programme was planned to progressively expand to cover all RCHEs over the territory in 2022/2023.

Strategic Interventions

8.1 Secure resources for implementing infection control programmes in hospitals

- The Government to allocate sufficient resources, both in terms of manpower and finance, for the effective and timely implementation of infection control programmes in healthcare setting

8.2 Enhance infection control infrastructure in hospitals

- To ensure ward designs are according to latest international guidelines and recommendations in planning new hospitals

8.3 Promote hand hygiene in healthcare settings

- To strengthen hand hygiene programmes to improve compliance by healthcare workers
- To ensure hand hygiene audits accurately reflect the actual practice, so as to reveal areas for interventions and monitoring for objective improvement by regular auditing

8.4 Address transmission of MDRO between hospitals and residential care homes

- To expand the universal decolonisation programme to all RCHEs in the territory
- To implement admission screening and decolonisation therapy in public hospitals for residential care homes residents
- To monitor the MDRO carriage rates in RCHE residents admitted to public hospitals, as surrogate to evaluate the effectiveness of the programme
- To identify areas of improvement in the implementation of infection prevention and control measures in residential care homes

Objective 9 - Strengthen infection control training for healthcare workers

66. Infection control training is an important component of an infection control program. This helps healthcare workers to acquire up-to-date knowledge, recognise the importance of infection control and understand their responsibilities in infection prevention.

67. Infection control trainings are conducted regularly in DH and HA, involving more than 10,200 and 23,400 staff respectively in 2021. The Hong Kong Training Portal on Infection Control and Infectious Diseases, established by DH and HA, serves as an online resource of knowledge for healthcare workers, including important news in infection control and as a collection hub of training materials from previous forums and seminars[33].

Strategic Interventions

9.1 Strengthen infection control training among healthcare workers

- To continue to provide basic infection control training for newly recruited healthcare workers and refresher training every 24 months for current staff
- To continue patient engagement programme on reminding healthcare workers to perform hand hygiene
- To objectively measure the effectiveness of the training and intervention by regular KAP surveys

Objective 10 - Develop and strengthen infection prevention and control programmes in veterinary settings and along food supply chain

68. It is recognised that there is a need to enhance the biosecurity measures and husbandry practices as well as the management and control of food animal production farms with a view to ensuring the prudent usage of antimicrobials in these farms. In this regard, AFCD has been visiting local livestock and fish farms to educate farmers on the concept of minimising AMU through disease prevention by good farming practices, good aquaculture practices and enhanced biosecurity measures. Moreover, AFCD has facilitated and supported formulation of tailor-made farm-specific management plans to address local AMR issues in conjunction with external veterinary services.

Strategic Interventions

10.1 Develop infection prevention and control policies and strategies

- To facilitate and support formulation of tailor-made farm-specific disease management plan for the purpose of disease prevention, management of disease spread and minimise the use of antibiotics
- To consider relocation and consolidation of livestock farms if necessary

10.2 Identify risk and potential control points for AMR containment along food supply chains

- To continue to assess the significance of food animal production in contributing to AMR and formulate suitable measures to address the AMR issues associated with food animal production through surveillance programmes
- To keep in view relevant studies to identify potential control points to contain AMR

10.3 Strengthen food safety and hygiene training for farm workers

- To provide regular education seminars on biosecurity, disease control and prevention and farm management to farmers and their workers
- To objectively measure the effectiveness of the training and intervention by regular KAP surveys

Objective 11 – Develop and strengthen surveillance and interventions to combat antimicrobial resistance in food

69. Foods can act as a potential vehicle for transmission of AMR bacteria. Apart from contamination at the farm, foods can also become contaminated at different points of post-harvest stage. They can be contaminated with AMR bacteria by infected food handlers particularly if the food handlers do not observe good hygienic practices when handling foods; or through improper food processing or unhygienic food preparation environment. To prevent foodborne illnesses and spread of AMR, food should be produced and handled in such a way as to minimise the introduction, presence and growth of bacteria.

70. CFS of FEHD has been conducting a routine surveillance programme on AMR in food since January 2022. A total of about 2,000 food samples including raw meat and ready-to-eat food would be collected and tested in two years. Food samples are collected from the retail level. They are tested for ESBL-producing *Enterobacteriaceae* (ESBL-E), Carbapenem-resistant organisms (CRO), Vancomycin-resistant *Enterococcus*, *E coli*, *Enterococcus*, *Salmonella* and *Campylobacter*, using selective and non-selective isolation. CFS will report data of the routine surveillance programme in the first quarter of 2023. CFS will continue to monitor the situation of ESBL-E especially in ready-to-eat food.

71. In view of the high prevalence of MDROs in raw meat and ready-to-eat foods in pilot survey by CFS in 2019-2020, a cornerstone to combat AMR is to enhance food and kitchen hygiene in an effective way, while effective control of foodborne AMR depends on the application of good hygienic practices at any point along the food chain to reduce the risk of contamination and spreading AMR bacteria to other foods.

72. CFS has worked closely with the food industry to promotes the Five Keys to Food Safety primarily developed by WHO, to explain the key areas to prevent foodborne diseases, regardless of whether the pathogens are AMR or non-AMR. The Five Keys to Food Safety include: (1) Choose (choose safe raw materials), (2) Clean (keep hands and utensils clean), (3) Separate (separate raw and cooked food), (4) Cook (cook thoroughly), and (5) Safe temperature (keep food at a safe temperature). These are simple health messages based on scientific evidence to tackle major contributing factors causing foodborne diseases. The five keys have all along been advocated by CFS to food handlers to prevent foodborne diseases and spread of AMR along the food chain and been promulgated through different channels such as training courses for Hygiene Managers and Hygiene Supervisors, Trade Consultation Forums and Food Safety Seminar. Such information will be continuously reinforced in food safety guidelines for food businesses on certain high-risk, ready-to-eat foods, e.g. sandwiches.

73. To further encourage and facilitate food businesses in informing consumers of the increased risk of consuming raw or undercooked foods and ingredients in ready-to-eat foods, the CFS has prepared and issued the "Guidelines for Food Businesses on Providing Consumer Advisory on High-risk Foods on Menus"[34]. The Guidelines provide practical examples on what and how to provide such consumer advisory. In the future, the FEHD will explore the feasibility of including such advice in the licensing conditions of certain licensed food businesses that sell certain high-risk foods, e.g. oysters intended for raw consumption, through deliberations with internal and external stakeholders.

74. To target and help address specific needs in food safety for susceptible populations, the CFS has produced food safety advices for the elderly, pregnant women, infant and young children, and people with weakened immunity. The message that the risk of taking uncooked or undercooked food and the notion that people can be infected by AMR bacteria but might not lead to food poisoning or any symptoms has been stepped up. Further information could be accessed at the new thematic page on AMR and food safety in CFS website[35] which provides a one-stop area for public and trade to access relevant publicity materials and educational resources on AMR. Health educational resources would be distributed to healthcare centres for pregnant women and the elderly, schools and patient groups to promote food safety at different social settings to accommodate preference for sources, formats and message types. For instance, the CFS has produced a pamphlet 'Know about "Superbugs" Hidden in Food' in 2022, explaining how AMR organism can spread along the food chain in an easy-to-understand way. Refer to **Objective 13** for further details on measures to raise the awareness of AMR among general public.

Strategic Interventions

11.1 Continue AMR surveillance in food

- To continue AMR surveillance in food

11.2 Empower the food businesses on prevention of AMR during food process

- To advocate for food businesses to implement Good Hygiene Practices to address foodborne AMR and facilitate consumers to make informed food choices
- To explore the feasibility of including such advice in the licensing conditions of certain licensed food businesses that sell certain high-risk foods, e.g. oysters intended for raw consumption, through deliberations with internal and external stakeholders

11.3 Strengthen food safety and hygiene training for food businesses

- To provide regular education seminars on food hygiene and safety to food businesses
- To introduce the concept of foodborne AMR in training courses for Hygiene Managers, Hygiene Supervisors and food handlers alike
- To objectively measure the effectiveness of the training and interventions

Objective 12 – Enhance vaccination uptake

75. Vaccination has been proposed by the WHO as an important measure in prevention of infection and control of AMR. Influenza activity is a strong driver of antibiotic prescription patterns and seasonal influenza vaccinations can potentially reduce inappropriate antibiotic use. Similar effects have been reported for pneumococcal vaccines as well[36].

76. Likewise, COVID-19 was associated with increased risk of secondary bacterial infections and the resultant increase in the risk of AMR development due to antimicrobial use[37]. Hence, the COVID-19 vaccine would have the secondary benefit in preventing the development of AMR.

77. Currently, the Government provides fully subsidised vaccinations for all children through the Hong Kong Childhood Immunisation Programme. Apart from that the Government has been providing free or subsidised seasonal influenza vaccinations for the high-risk population, including children, the elderly, patients with chronic medical problems and healthcare workers. Free or subsidised pneumococcal vaccinations are also provided to persons aged 65 and above. The COVID-19 Vaccination Programme, launched in February 2021, offered free COVID-19 vaccination to the whole population. Various publicity and promotion efforts have been implemented to promote the vaccine uptakes in the target populations.

78. In 2021/22 season, as at 1 July 2022, the coverage of seasonal influenza vaccination in children aged between 6 months and under 6, children aged between 6 and under 12, persons aged between 50 and 64 and persons aged 65 and above were 37.6%, 65.8%, 11.2% and 40.4% respectively, while 46.7% of the elderly population aged 65 or above had received pneumococcal vaccination[38]. As of end-August 2022, 93.5%, 90.5% and 72.0% of the population in Hong Kong have received the 1st, 2nd and 3rd dose of COVID-19 vaccine respectively[39].

Strategic Interventions

12.1 Promote vaccinations contributing to prevention of antimicrobial resistant infections

- To continue promotion of the uptake rate of vaccination contributing to the prevention of AMR infections, including season influenza, pneumococcal and COVID-19 vaccination