

Emerging Infectious Diseases in HKSAR

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The population density and mobility in Hong Kong are among the highest in the world, and this locality has historically been the ideal amplifier and disseminator of emerging infectious diseases originating from Mainland China. In 1894, half of the HK population died or fled because of plague. The bacteria responsible was discovered by two competitors, Dr. Alexander Yersin from the Institut Pasteur and Dr. Kitasato from Japan from the clinical specimens of Hong Kong Chinese. Since then HK has been intermittently affected by Influenza outbreaks in 1957, 1968 and 1997, and SARS in 2003. Three of these four outbreaks affected the whole world and were called pandemics. Of course there were major and minor outbreaks of cholera, each had different degree of impact on tourism and the image of HKSAR as an international cosmopolitan city. The SARS outbreak of 2003 affected over 8000 people with almost a thousand deaths. China had lost over 80 billion Chinese Yuan. The air traffic and economy of China and Asia were almost paralyzed. Besides Mainland China, the HKSAR was the second most affected part of the world.

The HKSAR is the traffic hub of Southern China and a global center for trade, finance, business and communications. She has one of the highest throughput container port system and the busiest airport in terms of passengers and international cargo. Since the adoption of an open economic policy by Mainland China in 1978, a rising number of visitors and cargo had flowed between HKSAR and the Mainland with an average annual increase of 23% in trade value. After the political transition in 1997, the integration of HKSAR into the Pearl River Delta of Southern China continues to accelerate. The open door policy and economic boom in Southern China are naturally associated with an increasing population density and the demand for food animal as a source of dietary protein. However, the public health policy and biosecurity measures at farms and wet markets cannot cope with the pace of this expansion and demand. These factors are important in the genesis of SARS and avian influenza H5N1.

The reckless use of antibiotics as growth enhancers in food animals and their indiscriminate use in humans have fueled the problem of antimicrobial resistance. This has obviously facilitated the flow of emerging pathogenic microbes from animals to humans. The development of economy and

tourism in southern China are also associated with a boom in the number of truck drivers and commercial sex workers. Incidence rates of sexually transmitted diseases and HIV are climbing. The latter can be associated with extensively drug resistant tuberculosis which may spill into the general population. Community acquired MRSA is also emerging in HKSAR. If this is combined with a pandemic influenza virus, they could be the most fatal disease combination of the new millenium. Continuous vigilance is required in the surveillance of emerging infectious diseases. For known microbes such as influenza A H5N1 that is causing the present pandemics in birds and poultry, continuous surveillance may identify strains with the most pandemic potential in humans. The results of these microbiological surveillance in animals and humans have clearly contributed to the epidemiological control, diagnosis and management of influenza A H5N1 and SARS coronavirus.

Our research had identified a novel Group IIb coronavirus as the cause of SARS from the lung tissue of a patient who died from the atypical pneumonia in 2003. As 70% of emerging infectious agents had come from animals, we proceeded to discover the Civet SARS coronavirus at the wild life markets in caged civet cats, which is the most popular wild game animal in winter. But further surveillance of wild and farmed Civet cats was unfruitful, suggesting that civet cats were just amplification hosts. Since the Lyssavirus, Nipah and Hendra viruses which had caused emerging human disease in the last 10 years had come from bats, we turned our attention to this group of warm-blooded flying mammals. A novel bat SARS coronavirus highly similar to the human and civet virus was discovered. If wild animals surveillance had been performed systematically before 2003, the SARS-like coronavirus group could have been discovered and HKSAR would have been better prepared for SARS. One year after the discovery of SARS coronavirus, we found another novel Group IIa coronavirus in a patient with community acquired pneumonia returning from Shenzhen. Hence, continuous vigilance is required in the surveillance of emerging infectious diseases.

Infectious diseases know no boundaries. The increasing regional and international travel can rapidly import emerging or re-emerging infections into Hong Kong and export them to South East Asia and various other parts of the world. The huge populations and high population densities of China and HKSAR provide an ideal incubator for brewing and spreading new infectious agents and antimicrobial resistance. Though new agents are discovered in Hong Kong, their sources could well be in the Mainland but

their detections were made in Hong Kong because of its relatively better surveillance and laboratory infrastructures.