

The role of environmental engineering in infectious disease control: SARS

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Abstract

Environmental engineering developed historically from public health engineering and sanitary engineering. The early emphasis was improvement of sanitary conditions and protection of human health through provision of safe water, safe sewage disposal, and safe waste disposal, thereby greatly reducing deaths caused by infectious and parasitic diseases in Hong Kong from more than 40% in 1912 to around 2% in 2000. Due to this success, the focus of modern environmental engineering has largely shifted to the protection of the natural environment through control and mitigation of harmful emissions from sewage and wastes. The recent outbreak of SARS reminded us that the risk of waterborne infectious diseases cannot be completely eliminated from developed societies and modern public health aspects need to be fully integrated again in the environmental engineering curriculum.

Based on the recent SARS outbreak, following are some issues and questions which have to be urgently addressed in environmental engineering:

- development and of rapid, reliable, and standardized methods to detect the SARS virus in water, wastewater, and waste;
- behaviour and survival of the SARS virus in wastewater and waste as well as during wastewater and waste treatment;
- efficiency of available disinfection methods for treated wastewater effluent in SARS control and development of new disinfection methods if necessary;
- assessment of health risk to workers in contact with wastewater or waste during collection, treatment, and disposal, especially due to aerosol formation;
- assessment of health risk in public bathing beaches close to discharges of treated or untreated wastewater effluents;
- evaluation and development of safe handling, treatment and disposal methods for SARS contaminated materials from hospitals and infected households, e.g. protective clothing, bed linen from isolation wards, etc.
- development of rapid and reliable disinfection methods for strongly contaminated wastewater from hospitals with SARS patients; and
- evaluation of drainage system in high-rise buildings for control of spread of SARS virus and assessment of possible introduction of dual drainage system.

Many of the problems raised above cannot be solved by environmental engineers alone and require close cooperation with specialist researchers from other areas. Any knowledge gained from research on the SARS virus will contribute to a better control of other, perhaps still unknown viral outbreaks in the future and improve the public health management in densely populated cities like Hong Kong.