

New paradigms in a microbe-threatened world

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ABSTRACT

Summary: Emerging and re-emerging infectious diseases had inflicted devastating damage to the world. The plague pandemic had killed 30% of population in Europe and may eventually contribute to the collapse of the Mongol Empire. Several influenza pandemics also affected the world population over the course of the 20th and early 21st centuries. The recent global changes may have significant impact on the risk of infectious disease outbreak. In particular, climate change potentially expands the range of locations suitable to a particular pathogen or vector, and the increased international travel will enable pathogens to reach the new environments more rapidly. In response to the challenges of emerging infectious diseases, World Health Organization comes up with a list of diseases and pathogens which are prioritized for research and development in the context of public health emergency. It includes viral haemorrhagic fever, Middle East respiratory syndrome coronavirus, severe acute respiratory syndrome coronavirus (SARS-CoV-2), Nipah virus, Zika virus, and Disease X, which represents a pathogen currently unknown to cause human disease but requires cross-cutting preparedness. In fact, the first Disease X has appeared and caused by a highly transmissible virus, subsequently identified to be a novel beta-coronavirus, SARS-CoV-2, which is the causative agent for Coronavirus disease 2019 (COVID-19). Our world is reshaped by the COVID-19 pandemic. To tackle the pre-symptomatic shedding and transmission of SARS-CoV-2, the most stringent public health measure was implemented to lockdown the cities in many parts of the world. Global lockdown may control the spread of the virus, but the impact of the lockdown has caused a significant impact in economy and different strata of our daily life. However, health is being prioritized above global economy in fight against COVID-19. Social distancing, universal masking, enhanced testing capacity for SARS-CoV-2, and mass vaccination for the population become a new norm in the COVID-19 pandemic. The COVID-19 pandemic will be eventually terminated. But our world is still threatened by emerging microbial agents which may have public health impact. It requires international collaboration to overcome the emerging threat and crisis.