

Potential factors influencing repeated SARS outbreaks in China

ABSTRACT

Within last 17 years two widespread epidemics of severe acute respiratory syndrome (SARS) occurred in China, which were caused by related coronaviruses (CoVs): SARS-CoV and SARS-CoV-2. Although the origin(s) of these viruses are still unknown and their occurrences in nature are mysterious, some general patterns of their pathogenesis and epidemics are noticeable. Both viruses utilize the same receptor—angiotensin-converting enzyme 2 (ACE2)—for invading human bodies. Both epidemics occurred in cold dry winter seasons celebrated with major holidays, and started in regions where dietary consumption of wildlife is a fashion. Thus, if bats were the natural hosts of SARS-CoVs, cold temperature and low humidity in these times might provide conducive environmental conditions for prolonged viral survival in these regions concentrated with bats. The widespread existence of these bat-carried or -released viruses might have an easier time in breaking through human defenses when harsh winter makes human bodies more vulnerable. Once succeeding in making some initial human infections, spreading of the disease was made convenient with increased social gathering and holiday travel. These natural and social factors influenced the general progression and trajectory of the SARS epidemiology. However, some unique factors might also contribute to the origination of SARS in Wuhan. These factors are discussed in different scenarios in order to promote more research for achieving final validation.

Keyword: Wuhan pneumonia; Coronavirus; CoV; Severe acute respiratory syndrome; SARS; COVID-19; Angiotensin-converting enzyme 2; ACE2; SARS-CoV; 2019-nCoV; Outbreak; Epidemic; Epidemiology; Infection; Drought; Bat; Green light; Red light; Wildlife; Host; Exposure; Risk