Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Introduction - Emerging Pathogens and the COVID-19 Pandemic

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As recent events with COVID-19 (SARS2-Cov, SARS-COV-2), demonstrated, coronaviruses are capable of significant human illness.[1–10] Historically coronaviruses have been considered low pathogenic viruses. That changed with SARS in 2003 when the first highly pathogenic coronavirus was discovered. SARS caused severe pulmonary illness, and was associated with a case fatality rate ~9%. With further study into SARS and other human pathogenic coronaviruses, it became clear these highly adaptive viruses should be added to the list of pathogens capable of causing major outbreaks.

Since SARS, two additional highly pathogenic coronaviruses have emerged MERS, and SARS2,[8–10] which throughout this article, SARS2 will be referred to as COVID-19.[5–8] This latest potentially deadly coronavirus, which emerged in late 2019, has caused a level of global illness unseen in numbers and rapidity since the major outbreaks of the early 19th century. According to the World Health Organization, as of 9 June 2020, COVID-19 has resulted in 7,039,918 confirmed cases and 404,396 deaths worldwide, 3,366,251 cases in the Americas, with 140,498 deaths. Of concern in some regions the number of cases continues to rise.[11,12]

Also worth noting, there remain a significant number of persons infected who are asymptomatic or have minimal disease – some of whom have not been tested. With increased numbers of infection survivors, questions concerning lingering illness, and potential chronic functional impairments needs to be further characterized. Additionally there has been inconsistency in testing throughout regions. All of which add to the challenge of epidemiologic modeling,

As will be discussed later, further magnifying the enormous threat COVID-19 poses is the question of immunity – can it be acquired through surviving the infection, or via vaccine, and how sustained is the immune protection?[13] And in the absence of specific COVID-19 antivirals, what are the best practices to date in the medical management of highly pathogenic coronaviruses?

While the questions seem to outnumber the answers, there are approaches that have had positive results clinically. With the rapidity of this pandemic, medical science has had a steep

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learning curve to climb, and research is still underway to answer the key questions we pose – immune response, protection, hyperimmune reaction, appropriate use of medications, non-medication interventions, appropriate preventive measures, vaccine development.[14,15] These and other issues will be discussed in the COVID-19 Section of this edition of Disease A Month. To be sure there remain gaps in our knowledge, and in many cases we will provide the best science available as opposed to definitive answers which remain to be discovered; at the moment these still seem to be the guiding principles of medical management against COVID-19 for the foreseeable future.

What follows is an overview of coronaviruses in general, with a review of SARS and MERS, and lastly an in depth look at COVID-19.

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