Abstract
A novel coronavirus (COVID-19) causing acute illness with severe symptoms has been isolated in Wuhan, Hubei Province, China. Since its emergence, cases have been found worldwide, reminiscent of severe acute respiratory syndrome and Middle East respiratory syndrome outbreaks over the past 2 decades. Current understanding of this epidemic remains limited due to its rapid development and available data. While occurrence outside mainland China remains low, the likelihood of increasing cases globally continues to rise. Given this potential, it is imperative that emergency clinicians understand the preliminary data behind the dynamics of this disease, recognize possible presentations of patients, and understand proposed treatment modalities.

KEYWORDS
global health, infectious disease, public health

1 | INTRODUCTION

Human coronavirus infections have once again been brought to global attention following the December 2019 emergence of a novel coronavirus (COVID-19) isolated from pneumonia cases clustered at a market in Wuhan, China. These ribonucleic acid (RNA) viruses’ animal reservoirs, zoonotic transmission, high mutation rates, and demonstrated human-to-human spread has made them of particular public health concern. The current potential for global dissemination of the COVID-19, given the co-occurrence of Lunar New Year celebrations, in addition to the growing number of reported cases, adds urgency to understanding this outbreak. The confirmation of cases in 29 countries as of February 8, 2020 (Figure 1) underscore the potential for COVID-19 to rapidly evolve into a global pandemic. We provide a summary of the origins, epidemiology, and emergency department clinical management of COVID-19.

2 | WHAT IS A CORONAVIRUS?

2.1 | Background on human coronaviruses

Based on genome sequencing, all known human coronaviruses have emerged from animal reservoirs.1 These RNA viruses have high mutation rates that allow them to adapt to varied hosts, increasing their potential for rapid human-to-human spread once a spillover event has occurred.1 The COVID-19 is the seventh identified human coronavirus, and appears to have notable similarities to 2 other highly pathogenic human respiratory coronaviruses, severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV),2 both of which have generated large-scale public health responses in the last 2 decades.3

The COVID-19, SARS-CoV and MERS-CoV belong to the family of betacoronaviruses, and likely share a common reservoir in bats.4
Intermediate hosts for zoonotic transmission to humans proposed for each of these 3 pathogenic strains include civets (SARS-CoV), dromedary camels (MERS-CoV), and an unconfirmed but likely mammalian source (COVID-19). These betacoronaviruses typically produce respiratory and gastroenteritis symptoms in human and animal hosts, respectively. The remaining identified human coronaviruses (HCoV-229E, HKU1, NL63, OC43) are limited in their severity of disease and often fail to produce symptoms greater than the common cold in immunocompetent hosts.

### 2.2 Recent coronavirus epidemics: SARS-CoV and MERS-CoV

Comparisons of the current COVID-19 outbreak are being made to 2 recently emerged coronaviruses from zoonotic spillover events; SARS-CoV (2002–2004, originating from Guangdong Province, China) and the multiple MERS-CoV outbreaks over the period (2012–2016, originating from Saudi Arabia). Further, all 3 pathogenic coronavirus syndromes seem to present with similar symptoms of cough, fever, and pneumonia. The current COVID-19 outbreak has eclipsed both the 2002 SARS outbreak and the 2012–2016 MERS outbreak in number of cases and is closing in on a similar death toll; however, both SARS and MERS appear to have had higher case-fatality rates (Table 1) and worse severity of illness. In comparison to seasonal influenza globally, coronaviruses represent a smaller burden of disease, and fall well short of the 1918 Influenza pandemic (Table 1).

### 3 NOVEL CORONAVIRUS-2019

#### 3.1 Emergence of COVID-19

On December 27, 2019, 3 adult patients presented with severe pneumonia to a hospital in Wuhan, China; a 49-year-old woman, a 61-year-old man, and a 32-year-old man. The woman was a known retailer in a seafood and wet animal wholesale market, while the older man was a frequent visitor. Similar circumstances and patients had been involved with the SARS-CoV outbreak, leading to suspicions of an n-CoV, and further testing revealed an n-CoV as the likely etiologic agent in all 3 cases.

#### 3.2 Transmission

Multiple reports have confirmed human-to-human transmission of the COVID-19. When person-to-person spread has occurred with MERS-CoV and SARS-CoV, it is thought to have happened mainly via respiratory droplets produced when an infected person coughs or sneezes, similar to how Influenza and other respiratory pathogens spread. Inoculation via “fomite-to-face” contact is also likely a significant contributor to the spread of the virus. Recently, the first case of asymptomatic transmission was reported, though the theory remains unproven. This development raises concerns that the COVID-19 may be similar to other viruses such as chickenpox and measles in that transmission may be possible during the incubation period or by patients with mild disease.

#### 3.3 Estimated morbidity and mortality

As of February 9, 2020, the mortality and morbidity rates of COVID-19 remain in flux. Currently, a case fatality rate (CFR) of slightly >3% has been reported, with some reports as high as 5%.

#### 3.4 Predictive epidemiologic modeling

Current epidemiologic models suggest transmission patterns similar to SARS and 1918 influenza pandemic. The World Health Organization (WHO) model, formulated by Ferguson and colleagues, suggests a basic reproductive number, $R_0$ (the number of new cases that can develop from 1 confirmed case) of 2.6–3.1, 2-fold higher than for
seasonal Influenza. Multiple other published models report similar ranges. These models make assumptions regarding the latent and incubation periods based upon extrapolation from MERS-CoV and SARS-CoV. These models and the virus’s behavior, thus far suggest the capability for sustained human-to-human transmission. Current rates of transmission are likely underestimated and will continue to evolve as the virus continues its spread, reporting practices evolve, and more data accrue. Many patients with infection likely experience only mild symptoms, do not present for evaluation, and thus, have not been included in statistics to date.

4 | CLINICAL COURSE AND MANAGEMENT

4.1 | Presentation

Knowledge of the COVID-19 presentation is limited by case reports of those presenting to the hospital and the unknown number of asymptomatic patients. To date, the average incubation period is estimated to be a median of 5 days with a range between 2 and 14 days. Based on an early descriptive study of patients admitted to a Wuhan regional referral hospital with confirmed COVID-19 pneumonia, the majority had fever (83%–98%) or cough (76%–82%) and roughly one-third had shortness of breath. Less common symptoms included myalgia (11%), rhinorrhea (10%), headache (8%), chest pain (2%), and gastrointestinal symptoms (3%).

The vast majority of patients presented with >1 symptom. Patients were mostly men with a median age of 59 years.

To date, over 29 countries have had confirmed cases of COVID-19, although most cases have been in mainland China, with reported cases in all provinces. Outside of China, the patients with COVID-19 infection have a median age of 45 years (range of 2–74 years) and are most male (71%). Approximately one third of patients had complications such as acute respiratory distress syndrome, acute renal injury, septic shock, ventilator-associated pneumonia, but it is unclear whether these cases were initial presentations or later stage disease. Approximately 23%–32% of patients were admitted to the ICU, primarily for increased oxygen support. The majority of patients were sustained on nasal cannula, a smaller subset required high flow or non-invasive ventilation, and an even smaller group requiring mechanical ventilation (4%–10%) or extracorporeal membrane oxygenation (<5%). These data, however, do not include the global burden of COVID-19. Approximately 80% of COVID-19 deaths were in patients over 60 years old. Over 75% of COVID-19 deaths had comorbid medical conditions such as hypertension, diabetes, or cardiovascular disease. The vast majority of attributable deaths have occurred in China, although the Philippines and Hong Kong have also suffered 1 death each.19

4.2 | Diagnosis

Because the signs and symptoms of COVID-19 are similar to other viral respiratory syndromes, health care professionals must obtain a detailed travel history in any patient presenting to the emergency department with fever and respiratory symptoms (Figure 2). Any patient with flu-like symptoms and travel to China or close contact with a person with confirmed COVID-19 in the past 14 days should be considered a patient under investigation (PUI). A close contact is anyone within 6 feet of a confirmed COVID-19 case for a prolonged period of time. Anyone with direct contact from secretions of a confirmed COVID-19 patient is also a close contact.

People who have traveled from Hubei and household members living with confirmed COVID-19 not adhering to home care or isolation precautions are considered high risk exposures. Medium risk exposures include those traveling in China but outside of Hubei province without high risk exposures and household members using consistently proper home care and isolation precautions. Low risk exposures include being in the same indoor environment such as a waiting room for a prolonged period with a confirmed COVID-19 case but not meeting the definition of close contact. No risk is identifiable for those who are in brief passing of a patient with confirmed COVID-19.

Diagnosis of COVID-19 is performed via molecular assays of respiratory specimens at WHO-designated regional referral laboratories. On February 7, the CDC began the distribution of test kits for regional testing. More widely available testing is anticipated to be available soon. For institutions where testing is unavailable, testing by the CDC remains the only option. Confirmation of another viral respiratory illness in a PUI should not delay COVID-19 testing. The decision to remove a patient from PUI status should be made after full clinical evaluation and consultation with public health authorities.
4.3 | Prevention

Currently, the transmission dynamics of COVID-19 are poorly understood. Infection prevention guidance or COVID-19 is based upon guidance previously developed for MERS and SARS as well as interim guidelines provided by the WHO and CDC.21,22

In health care settings, triage and out-of-hospital protocols should identify a PUI before or upon ED arrival to minimize exposure to other patients and providers. Measures should include screening questions (including travel history) and respiratory and hand hygiene. After identifying a PUI, both hospital infection control and the local health department should be contacted immediately to prevent further spread amongst patients and health care workers. Any PUI should be given a surgical mask and placed in a private room or negative pressure room if available.21

Like MERS and SARS, it is assumed the COVID-19 can be spread by the airborne route. Surgical face masks may be helpful for larger fluid droplets associated with coughing and sneezing, but they are unlikely to help with small airborne contaminants.23 Where available, respirators with an adequate seal and air movement directed through filters should be more effective.24–26 The proper usage of respirators and other personal protective equipment (PPE) including donning, fit, and frequent changing combined with proper hand hygiene represent the most effective method of preventing transmission in health care settings.23,27,28

If a patient needs to be hospitalized and an airborne infection isolation room is not available, the patient should be transferred to a facility with appropriate capabilities. Isolation rooms and care processes should be configured to minimize the number of health care personnel exposed to the patient as well as the duration of contact. It is paramount that all health care professionals use standard, contact, droplet, and airborne precautions in addition to an eye shield. PPE is especially important during aerosol-generating procedures (eg, intubation) when transmission is likely increased.22,29 After a patient vacates the room, it is unknown how long COVID-19 stays airborne. Entrance to the vacated room requires respiratory protection for a...
period that is specific to the ventilation and clearance rates for the room.

4.4 | Disposition

Not all COVID-19 exposed or afflicted patients will need hospital admission. However, the decision to discharge a PUI for home isolation should be made in consultation with the local public health authorities.30 Patients should be directed to use appropriate hand hygiene, wear a simple facemask when around others, and remain isolated to a single room in the house whenever possible.30 Patients should only leave the house for medical attention after calling in advance to inform the medical office of their COVID-19 PUI status.31 Although patients with mild symptoms can be discharged, there are reports of clinical decline in the second week of illness with over 50% of patients having dyspnea around day 8.31 Therefore, discharge may be inappropriate for patients who are unable to adhere to recommendations, return precautions, self-monitoring, or those with inadequate housing. Patients with evidence of severe illness (hypotension, tachycardia, hypoxia, or other signs of shock) or those with comorbidities (older age, immunocompromised, chronic conditions such as diabetes, cardiovascular, or chronic lung disease) will require admission to isolation units and/or the ICU.

4.5 | Standard/supportive care

The WHO has published comprehensive, evidence-based guidelines for caring for patients with severe acute respiratory infections thought to be related to COVID-19.20,32 The mainstay of treatment for suspected COVID-19 infections is supportive care. In patients suspected of COVID-19 infection, viral testing should be initiated early for disease confirmation and symptomatic treatment initiated as needed. Intravenous fluids should be used judiciously in patients without overt signs of fluid depletion as they may worsen oxygenation with increasing disease severity. In patients presenting with severe respiratory symptoms with radiographic findings, broad spectrum antibiotics should be administered early, since it is often not possible to differentiate between bacterial pneumonia and COVID-19 infections.20,32 As with MERS and SARS, steroids should be avoided.

4.6 | Lessons learned from SARS/MERS and emerging treatments

Beyond supportive care, there are no proven alternative treatments for coronavirus infections, although several potential therapies have been suggested and tested in limited settings. Data from both the SARS and MERS epidemics have demonstrated worse long-term outcomes with the use of corticosteroids, and the use of steroids should only be reserved for patients requiring treatment for other disease processes.32–34 While currently not supported by the CDC or WHO guidelines, retrospective studies of the use of the protease inhibitors lopinavir and ritonavir during the SARS outbreak demonstrated improved survival when compared to case-matched patients receiving standard therapy.35,36 Ribavirin, however, resulted in worse SARS outcomes when compared to case-matched control patients.37 In contrast, based upon limited data, Ribavirin seems to be associated with improved MERS survival.37 Similar randomized trials evaluating lopinavir/ritonavir for MERS have been designed, but are not yet completed. Current reports confirm that the Chinese Health Ministry is treating COVID-19 infected patients with lopinavir/ritonavir, but there are no data on the outcomes.

5 | CONCLUSION

The WHO has declared COVID-19 a Public Health Emergency of International Concern. Currently, other seasonal infections cause more global disease than COVID-19. However, there are concerning elements to this emerging infectious agent, including a greater R0, initial greater estimated mortality, and no inherent immunity in global populations. Though data remains limited, it is imperative that emergency clinicians understand the dynamics of this emerging epidemic at both the individual- and population-based levels, learn how to recognize those patients at risk or suffering from COVID-19, and prepare to treat these patients in their clinical practice.

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REFERENCES
1. Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. Nat Rev Microbiol. 2019;17(3):181-192.
2. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020. NEJMoa2001017.
3. Wuhan Municipal Health Committee [Internet]. [Published February 2, 2020]. Available at http://wjw.wuhan.gov.cn/front/web/showDetail/2019123108989. Accessed February 2020.
4. 2019 Novel Coronavirus (2019-nCoV) Situation Summary | CDC [Internet]. 2020 [Published February 2, 2020]. Available at https://www.cdc.gov/coronavirus/2019-ncov/situation-summary.html. Accessed February 9, 2020.
5. Callaway E, Cyranoski D. Why snakes probably aren’t spreading the new China virus. Nature [Internet]. 2020 [Published February 2, 2020]. Available at https://www.nature.com/articles/d41586-020-00180-8. Accessed February 9, 2020.
6. Epidemiology, Genetic Recombination, and Pathogenesis of Coronaviruses: Trends in Microbiology [Internet]. [Published February 2, 2020]. Available at https://www.cell.com/trends/microbiology/fulltext/S0966-842X(16)00071-8?returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0966842X16000718%3Fs how%3Dtrue. Accessed February 9, 2020.
7. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. The Lancet [Internet]. 2020 [Published February 2, 2020] 0(0):S0140-6736(20)30185-9. Available from: https://www.thelancet.com/journals/lancet/article/PII/S0140-6736(20)30185-9/abstract. Accessed February 1, 2020.
8. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med. 2020;NEJMoa2001316.

9. ProMED-mail [Internet]. [cited February 2, 2020]. Available at https://promedmail.org/. Accessed February 1, 2020.

10. Perlman S. Another decade, another coronavirus. N Engl J Med. 2020;0(0). https://doi.org/10.1056/NEJM200126. Accessed February 1, 2020.

11. Rothe C, Schunk M, Sothmann P, et al. Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. N Engl J Med. 2020;NEJMc2001468.

12. Riu J, Althaus CL. Pattern of early human-to-human transmission of Wuhan 2019-nCoV [Internet]. Microbiology. 2020; [cited February 2, 2020]. Available at http://biorxiv.org/lookup/doi/10.1101/2020.01.23.917351.

13. Imai N, Dorigatti I, Cori A, Donnelly C, Riley S, Ferguson NM. Report 2: estimating the potential total number of novel coronavirus cases in Wuhan City, China. MRC Centre for Global Infectious Disease. Imperial College. 2020;6.

14. Read JM, Bridgen JR, Cummings DA, Ho A, Jewell CP. Novel coronavirus 2019-nCoV: early estimation of epidemiological parameters and epidemic predictions [Internet]. Infectious Diseases (except HIV/AIDS). 2020; [cited February 2, 2020]. Available at http://medxnr.org/lookup/doi/10.1101.2020.01.23.20018549.

15. Coronavirus 2019-nCoV [Internet]. [Published February 8, 2020]. Available at https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6. Accessed February 1, 2020.

16. Coburn BJ, Wagner BG, Blower S. Modeling influenza epidemics and pandemics: insights into the future of swine flu (H1N1). BMC Med. 2009;7:30.

17. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. The Lancet [Internet]. 2020; [Published February 2, 2020].0(0). Available at https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30211-7/abstract. Accessed February 4, 2020.

18. Coronavirus Has Now Spread To All Regions Of Mainland China [Internet]. NPR.org. [Published February 2, 2020]. Available at https://www.npr.org/sections/healthshots/2020/01/30/801142924/coronavirus-has-now-spread-to-all-regions-of-mainland-china. Accessed February 7, 2020.

19. Statement on the meeting of the International Health Regulations 2005 Emergency Committee regarding the outbreak of novel coronavirus 2019 (n-CoV) on 23 January 2020 [Internet]. [Published February 2, 2020]. Available at https://www.who.int/news-room/detail/23-01-2020-statement-on-the-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov). Accessed February 2, 2020.

20. Interim Clinical Guidance for Management of Patients with Confirmed 2019 Novel Coronavirus (2019-nCoV) Infection [Internet]. 2020 [Published February 2, 2020]. Available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html. Accessed February 4, 2020.

21. Laboratory guidance [Internet]. [Published February 2, 2020]. Available at https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/laboratory-guidance. Accessed February 3, 2020.

22. Infection Control: Novel Coronavirus 2019 (2019-nCoV) | CDC [Internet]. 2020 [Published February 2, 2020]. Available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control.html

23. OSHA Fact Sheet: Respiratory Infection Control: Respirators Versus Surgical Masks | Occupational Safety and Health Administration [Internet]. [cited February 2, 2020]. Available at https://www.osha.gov/Publications/respirators-vs-surgicalmasks-factsheet.html. Accessed February 2, 2020.

24. Tran K, Cimon K, Severn M, et al. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. PLoS One [Internet]. 2012;7(4). [cited February 2, 2020]. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3338532/

25. Transmission-Based Precautions | Basics | Infection Control | CDC [Internet]. 2019 [cited February 2, 2020]. Available at https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html. Accessed February 2, 2020.

26. Smith JD, MacDougall CC, Johnstone J, et al. Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis. CMAJ. 2016;188(5):567-574.

27. Radonovich LJ, Simberkoff MS, Bessemes M, et al. N95 respirators vs medical masks for preventing influenza among health care personnel: a randomized clinical trial. JAMA. 2019;322(9):824-833.

28. Cowling BJ, Chan K-H, Fang VJ, et al. Facemasks and hand hygiene to prevent influenza transmission in households. Ann Int Med. 2009;151(7):437-446.

29. Raboud J, Shigayeva A, McGeer A, et al. Risk factors for SARS transmission from patients requiring intubation: a multicentre investigation in Toronto, Canada. PLoS One [Internet]. 2010;5(5). [cited February 2, 2020]. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2873403/

30. Maclntyre CR, Chughtai AA. Facemasks for the prevention of infection in healthcare and community settings. BMJ [Internet]. 2015;350. [cited February 2, 2020]. Available at https://www.bmj.com/content/350/bmj.h694. Accessed February 2, 2020.

31. Interim Guidance: Home Care for 2019-nCoV | CDC [Internet]. 2020 [cited February 2, 2020]. Available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-home-care.html. Accessed February 2, 2020.

32. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected [Internet]. [cited February 9, 2020]. Available at https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected. Accessed February 2, 2020.

33. Interim Clinical Guidance for Management of Patients with Confirmed 2019 Novel Coronavirus (2019-nCoV) Infection [Internet]. 2020 [cited February 8, 2020]. Available at https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html. Accessed February 2, 2020.

34. Kargel MJ, Lapinsky SE. Pro/con clinical debate: steroids are a key component in the treatment of SARS. Con: no, steroids are not a key component of the treatment regimen for SARS. Crit Care Lond Engl. 2004;8(2):105-107.

35. Chan KS, Lai ST, Chu CM, et al. Treatment of severe acute respiratory syndrome with lopinavir/ritonavir: a multicentre retrospective matched cohort study. Hong Kong Med J Xianggang Yi Xue Za Zhi 2003;9(6):399-406.

36. Chu C, Cheng V, Hung I, et al. Role of lopinavir/ritonavir in the treatment of SARS: initial virological and clinical findings. Thorax. 2004;59(3):252-256.

37. Dyall J, Gross R, Kindrachuk J, et al. Middle east respiratory syndrome and severe acute respiratory syndrome: current therapeutic options and potential targets for novel therapies. Drugs. 2017;77(18):1935-1966.
38. Riou J, Althaus CL. Pattern of early human-to-human transmission of Wuhan 2019-nCoV [Internet]. Microbiology. 2020 [cited February 8, 2020]. Available at http://biorxiv.org/lookup/doi/10.1101/2020.01.23.917351. Accessed February 2, 2020.

39. Bauch CT, Lloyd-Smith JO, Coffee MP, Galvani AP. Dynamically modeling SARS and other newly emerging respiratory illnesses: past, present, and future. Epidemiology. 2005;16(6):791-801.

40. Leung GM, Hedley AJ, Ho L-M, Chau P. The epidemiology of severe acute respiratory syndrome in the 2003 Hong Kong epidemic: an analysis of all 1755 patients. Ann Intern Med. 2004;141(9):662-673.

41. WHO | Middle East respiratory syndrome coronavirus (MERS-CoV) [Internet]. WHO. [cited February 8, 2020]. Available at http://www.who.int/emergencies/mers-cov/en/. Accessed February 2, 2020.

42. Choi S, Jung E, Choi BY, Hur YJ, Ki M. High reproduction number of Middle East respiratory syndrome coronavirus in nosocomial outbreaks: mathematical modelling in Saudi Arabia and South Korea. J Hosp Infect. 2018;99(2):162-168.

43. Biggerstaff M, Cauchemez S, Reed C, Gambhir M, Finelli L. Estimates of the reproduction number for seasonal, pandemic, and zoonotic influenza: a systematic review of the literature. BMC Infect Dis [Internet]. 2014:14. [cited February 7, 2020]. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4169819/. Accessed February 7, 2020.

44. Johnson NPAS, Mueller J. Updating the accounts: global mortality of the 1918–1920 “Spanish” influenza pandemic. Bull Hist Med. 2002;76(1):105-115.

45. Chowell G, Miller MA, Viboud C. Seasonal influenza in the United States, France, and Australia: transmission and prospects for control. Epidemiol Infect. 2008;136(6):852-864.

46. Paget J, Spreeuwenberg P, Charu V, et al. Global mortality associated with seasonal influenza epidemics: new burden estimates and predictors from the GLaMOR Project. J Glob Health [Internet]. 9(2). [cited February 7, 2020]. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6815659/. Accessed February 7, 2020.

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