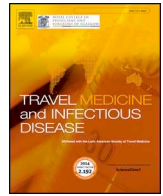




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Coronavirus 2019-nCoV: Is the genie already out of the bottle?



Dear Editor,

Once again, a virus has jumped the species barrier. Coronavirus 2019-nCoV emerged apparently in a wet market in China, and after a few weeks the number of cases already exceeds those of SARS in 2002/03 (Fig. 1) [1] in terms of both morbidity and mortality. Excellent publications have addressed many aspects of a possible novel endemic/pandemic zoonosis, often with a focus on MERS-CoV (2–4), including prevention [2], drug and vaccine-development for coronaviruses [3], or the importance of “a ‘One Health’ approach to control ... zoonotic pathogens with epidemic potential” [4]. The hugely increased appetite for meat-products worldwide, but also in China [5], is likely to increase livestock production and sale, as well as scavenging of remaining wildlife resources, primarily the latter with consequent increases in the risk of exposure to novel infectious agents.

The role which few available drugs, e.g. nucleoside analog Remdesivir, lopinavir-ritonavir and ribavirin, which showed some limited activity in SARS/MERS-CoV [3], might play in the prevention or curbing disease episodes is not clear yet; neither the role of other compounds with some limited level of evidence of (not even necessarily 2019-nCoV) inhibitory activity mainly from animal testing,

such as some antimalarials [6]. The development of therapeutic monoclonal antibodies and vaccines has been hampered in the past by the unpredictability of the next, emerging coronavirus [3]. The sudden public interest in a coronavirus vaccine seems somewhat ironic, given that vaccine hesitancy was identified as one of the ten global threats to health, identified in 2019 by the World Health Organization (WHO). However, the story of the Ebola vaccine [7] casts serious doubts on claims by some officials that a vaccine for the current 2019-CoV strain could be made available in a few months, given the huge challenges in developing, clinical testing, mass-producing and distributing such a vaccine. Of course, this makes prevention efforts the best, if not only practical option [2,4].

News about travel restrictions, looming economic turmoil and the (perceived) risk for one's personal health ring alarm bells around the globe. The number of cases may be much higher than the daily, ever-increasing numbers reported, as many infected individuals may be asymptomatic, or only be slightly symptomatic, yet still be infectious, as indicated by the viral load of 10^8 copies/ml sputum in the first German case [8]. The case-fatality-rate (CFR) in confirmed cases in China is rather stable at around 2% so far (Figure), although lower than for SARS (~10%) or MERS (~30%) [3–5]. Pandemic influenza, often used as a

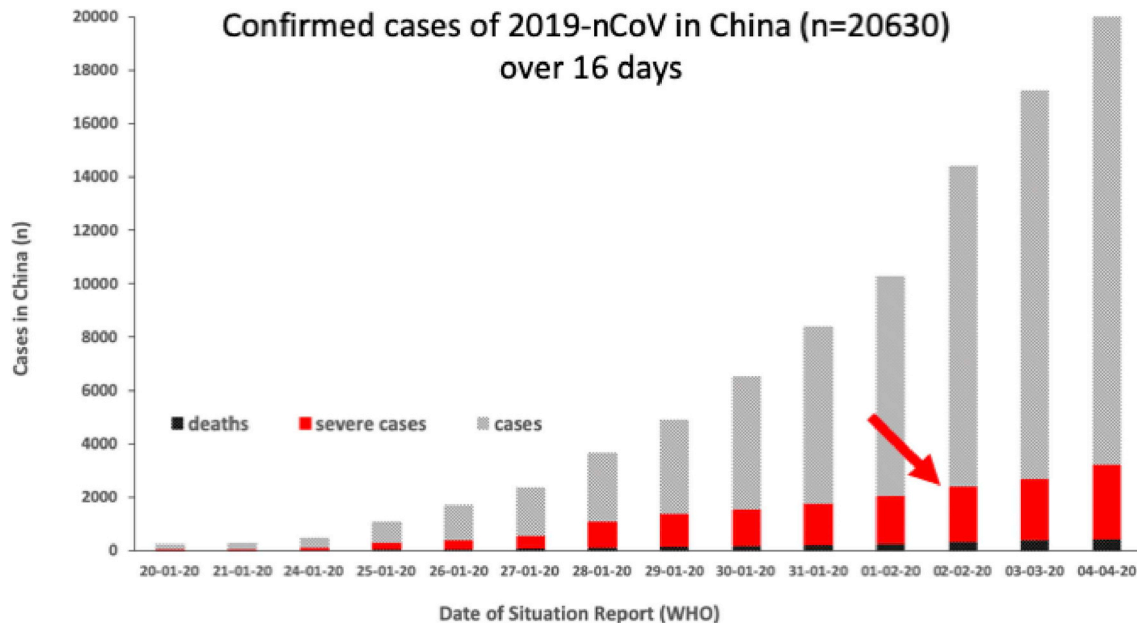


Fig. 1. Epidemiological curve of 2019-nCoV and SARS (data source WHO [1]).

All cases in China, with numbers of deaths and severe cases from the WHO Situation Reports (1–15) as of 5th of February. Note, the case fatality rate is very stable at around 2%, as well as the rather high rate of severe cases of around 15% (red arrow).

<https://doi.org/10.1016/j.tmaid.2020.101577>

Received 5 February 2020; Accepted 6 February 2020

Available online 07 February 2020

1477-8939/ © 2020 Elsevier Ltd. All rights reserved.

comparison at the moment, had an estimated CFR of 0.5% in confirmed cases and 0.05% in symptomatic cases during the 2009 season (H1N1) [9]. While it is expected that the 2019-nCoV causes more severe disease in those with underlying medical conditions, the first published case series (n = 99) reports that only 50% had co-morbidities, while the first two fatal cases had none, other than being smokers [10].

This leaves an important number rather overlooked: the number of severe cases (arrow in Fig. 1) which hovers around the 15% mark. It may be assumed that these patients require hospitalization, if not ventilation-based intensive care treatment. Given the limited number of (ventilator-equipped) intensive care beds, let alone negative pressure isolation beds, it seems obvious that even the treatment capacities of the most affluent countries will be very quickly exhausted if the epidemic spreads further. This is reminiscent of the large West-African Ebola virus disease outbreak 2013–2016, where possibly many people died of other (“usual”) health problems because the regular healthcare services were overwhelmed, if not rendered entirely dysfunctional [11].

Hopefully, China does manage to control this outbreak. If 2019-CoV reaches other densely populated areas with fragile health systems (a case was already observed in India [1]), we may be well underway towards a pandemic.

Funding

No funding received.

Declaration of competing interest

None of the authors has any conflict of interest to declare.

References

- [1] WHO. Novel Coronavirus (2019-nCoV) situation reports. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>, Accessed date: 3 February 2020.
- [2] Baharoon S, Memish ZA. MERS-CoV as an emerging respiratory illness: a review of prevention methods. *Trav Med Infect Dis* 2019 Nov 12:101520. <https://doi.org/10.1016/j.tmaid.2019.101520>.
- [3] Totura AL, Bavari S. Broad-spectrum coronavirus antiviral drug discovery. *Expert Opin Drug Discov* 2019 Apr;14(4):397–412. <https://doi.org/10.1080/17460441.2019.1581171>. Epub 2019 Mar 8.
- [4] Zumla A, Dar O, Kock R, Muturi M, Ntoumi F, Kaleebu P, Eusebio M, Mfinanga S, Bates M, Mwaba P, Ansumana R, Khan M, Alagaili AN, Cotten M, Azhar EI, Maeurer M, Ippolito G, Petersen E. Taking forward a 'One Health' approach for turning the tide against the Middle East respiratory syndrome coronavirus and other zoonotic pathogens with epidemic potential. *Int J Infect Dis* 2016 Jun;47:5–9. <https://doi.org/10.1016/j.ijid.2016.06.012>. Epub 2016 Jun 15.
- [5] OECD Data. Meat consumption. <https://data.oecd.org/agroutput/meat-consumption.htm>, Accessed date: 5 February 2020.
- [6] D'Alessandro S, Scaccabarozzi D, Signorini L, Perego F, Ilboudo DP, Ferrante P, et al. The use of antimalarial drugs against viral infection. *Microorganisms* 2020;8:85. <https://doi.org/10.3390/microorg8010085>.
- [7] Callaway E. Make Ebola a thing of the past: first vaccine against deadly virus approved. *Nature* 2019 Nov;575(7783):425–6. <https://doi.org/10.1038/d41586-019-03490-8>.
- [8] Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, Zimmer T, Thiel V, Janke C, Guggemos W, Seilmaier M, Drosten C, Vollmar P, Zwirgmaier K, Zange S, Wölfel R, Hoelscher M. Transmission of 2019-nCoV infection from an asymptomatic contact in Germany. *N Engl J Med* 2020 Jan 30. <https://doi.org/10.1056/NEJMc2001468>. [Epub ahead of print].
- [9] Nishiura H. Case fatality ratio of pandemic influenza. *Lancet Infect Dis* 2010 Jul;10(7):443–4. [https://doi.org/10.1016/S1473-3099\(10\)70120-1](https://doi.org/10.1016/S1473-3099(10)70120-1).
- [10] Chen N, Zhou M, Dong X, Qu Q, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, Xia J, Yu T, Zhang X, Zhang L. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet* 2020. [https://doi.org/10.1016/S0140-6736\(20\)30211-7](https://doi.org/10.1016/S0140-6736(20)30211-7). Published: January 30, 2020.
- [11] Parpia AS, Ndeffo-Mbah ML, Wenzel NS, Galvani AP. Effects of response to 2014–2015 Ebola outbreak on deaths from malaria, HIV/AIDS, and tuberculosis, west africa. *Emerg Infect Dis* 2016 Mar;22(3):433–41. <https://doi.org/10.3201/eid2203.150977>.

Thomas Hanscheid*

Instituto de Microbiologia, Faculdade de Medicina, Universidade de Lisboa, Lisboa, Portugal

E-mail address: t.hanscheid@medicina.ulisboa.pt.

Emília Valadas

Clínica Doenças Infecciosas e Parasitárias, Faculdade de Medicina, Universidade de Lisboa, Lisboa, Portugal

Martin P. Grobusch

Center of Tropical Medicine and Travel Medicine, Department of Infectious Diseases, Division of Internal Medicine, Amsterdam University Medical Centers, University of Amsterdam, Amsterdam, the Netherlands

* Corresponding author. Instituto de Microbiologia, Faculdade de Medicina, Universidade de Lisboa, Avendia Prof. Egas Moniz, 1649-028, Lisboa, Portugal.