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A distinct name is needed for the new coronavirus

An outbreak of unusual respiratory disease, initially dominated by pneumonia, in Wuhan, China, is caused by infection by a novel coronavirus. The new virus was initially named 2019-nCoV by WHO.¹⁻³

On Feb 11, 2020, WHO renamed the disease as coronavirus disease 2019 (COVID-19).⁴ That same day, the Coronavirus Study Group (CSG) of the International Committee on Virus Taxonomy posted a manuscript on *bioRxiv* in which they suggested designating 2019-nCoV as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on the basis of a phylogenetic analysis of related coronaviruses.⁵ The CSG claimed that they did not intend to make any reference to SARS when introducing yet another virus name derived from the term SARS; however, SARS is a disease name, and to name the new virus SARS-CoV-2 actually implies that it causes SARS or similar, especially to scientists without much knowledge of virology and to citizens in the public domain. The new name is also not consistent with the disease name COVID-19. SARS-CoV-2, as a naturally occurring virus, is different from all other SARS-like or SARS-related coronaviruses, which are characterised mainly by their genome sequence.

As of Feb 17, 2020, 2019-nCoV has caused 71331 human infections and 1775 deaths in China and 24 other countries, and it is distinct from SARS-CoV in biological, epidemiological, and clinical features. Naming 2019-nCoV as SARS-CoV-2 is therefore truly misleading. For such an epidemic virus with apparent international concern, it deserves its own unique name.

2019-nCoV is still evolving, and it is too early to predict the outcome of the current outbreak. Some experts predicted that 2019-nCoV could evolve to a low pathogenic but highly transmissible coronavirus, which might return every winter, like the virus that causes seasonal influenza.⁶ If this is the case, the name SARS-CoV-2 might have adverse effects on the social stability and economic development in countries where the virus is causing an epidemic, perhaps even around the world. People develop panic at the thought of a re-occurrence of SARS. Travellers and investors might not want to visit a country with an ongoing epidemic or even sporadic cases of SARS. People may also believe that, like SARS-CoV, 2019-nCoV will not re-emerge once the current outbreak ends; therefore, they might not be prepared to prevent 2019-nCoV infection in the near future and could lose a sense of alert.

On the basis of special clinical, virological, and epidemiological characteristics and the uncertainty of the novel coronavirus, to avoid the misleadingness and confusion, and to help scientists and the public with better communication, we, a group of virologists in China, suggest renaming SARS-CoV-2 as human coronavirus 2019 (HCoV-19). Such a name distinguishes the virus from SARS-CoV and keeps it consistent with the WHO name of the disease it causes, COVID-19.

We declare no competing interests.

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- 5 Gorbalenya AE, Baker SC, Baric RS, et al. Severe acute respiratory syndrome-related coronavirus: the species and its viruses—a statement of the Coronavirus Study Group. *bioRxiv* 2020; published online Feb 11. DOI:2020.02.07.937862 (preprint).
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SARS-CoV-2 is an appropriate name for the new coronavirus

We have read with great interest the Correspondence by Shibo Jiang and colleagues,¹ in which they propose a name change for the newly emerged coronavirus,² which was recently designated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the Coronavirus Study Group of the International Committee on Taxonomy of Viruses.³ The authors argued that the use of SARS in the virus name could confuse the public about the disease that it causes; in addition, they noted that the name SARS-CoV-2 is not consistent with the disease name chosen by WHO, coronavirus disease 2019. The authors also indicated that scientifically, SARS-CoV-2 is naturally occurring and different from other SARS-like or SARS-related coronaviruses that are

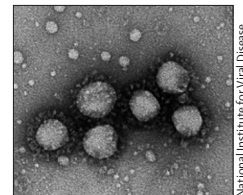


Image of 2019-nCoV by electron microscopy

Published Online
 February 18, 2020
[https://doi.org/10.1016/S0140-6736\(20\)30419-0](https://doi.org/10.1016/S0140-6736(20)30419-0)



Published Online
 March 5, 2020
[https://doi.org/10.1016/S0140-6736\(20\)30557-2](https://doi.org/10.1016/S0140-6736(20)30557-2)

mainly characterised by their genome sequences. Furthermore, given the probability of future attenuation of this virus to a low-pathogenic form, the authors predict that the use of the name SARS-CoV-2 might have adverse effects, both socially and economically. On these grounds, the authors suggest that the name of the new virus is changed to human coronavirus 2019 (HCoV-19). Although these concerns and suggestions are appreciated, we feel that the adoption of SARS-CoV-2 by the Coronavirus Study Group was appropriate.

To facilitate good practice and scientific exchange, the International Committee on Taxonomy of Viruses has established standardised formats for classifying viruses. Under these rules, a newly emerged virus is normally assigned to a species based on phylogeny and taxonomy.⁴ Through DivErsity pArtitioning by hieRarchical Clustering-based analyses,⁵ the newly emerged coronavirus was deemed not sufficiently novel but is a sister virus to SARS-CoV, the primary viral isolate defining the species. The SARS-CoV species includes viruses such as SARS-CoV, SARS-CoV_PC4-227, and SARSr-CoV-btKY72. SARS-CoV-2 is the newest member of this viral species. The use of SARS in naming SARS-CoV-2 does not derive from the name of the SARS disease but is a natural extension of the taxonomic practice for viruses in the SARS species. The use of SARS for viruses in this species mainly refers to their taxonomic relationship to the founding virus of this species, SARS-CoV. In other words, viruses in this species can be named SARS regardless of whether or not they cause SARS-like diseases.

The relationship between the name of a viral pathogen and its associated diseases is complex. Although the International Committee on Taxonomy of Viruses is responsible for naming viral species, WHO is responsible for naming the diseases caused by

newly emerging viruses. For various reasons, the name of a disease and its causative viral pathogen can be different, as exemplified by acquired immunodeficiency syndrome (AIDS) and human immunodeficiency virus (HIV).

We also believe that the use of the name SARS-CoV-2 will not affect social stability and economic development in the affected countries, as the authors envision. Given that the cross-species transmission of SARS-CoV-2 is currently not well understood, and no effective approach to stop such zoonotic transmission has been established, SARS-related coronaviruses, such as SARS-CoV-2 (or even SARS-CoV-3 in the future), might continue to emerge and re-emerge. This has been exemplified in the transmission of Middle East respiratory syndrome-related coronavirus, in which multiple spillover events occurred from camels to humans, resulting in human infections.⁶ Thus, keeping SARS in the names of viruses of that species would be beneficial to keep the general public vigilant and prepared to respond quickly in the event of a new viral emergence. Should SARS-CoV-2 be significantly attenuated to the point of becoming a new low-pathogenic or non-pathogenic virus, such attenuated viral isolates could be named as low-pathogenic human coronaviruses, such as LPH-CoV.

We believe that the naming of SARS-CoV-2 by the Coronavirus Study Group is aligned with the goals of the International Committee on Taxonomy of Viruses to facilitate good practice and scientific exchange. Given that SARS-CoV-2 is already being used in the scientific literature, a name change at this stage would cause confusion in the scientific community. With all the uncertainties about this newly emerged pathogenic virus, we suggest keeping SARS-CoV-2 as its name.

We declare no competing interests. The opinions expressed in this Correspondence are the personal opinions of the authors.

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