Emergence of novel coronavirus SARS-CoV2 in China and the response in Mexico

Emergencia del coronavirus SARS-CoV2 en China y la respuesta en México

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Mais il vient toujours une heure dans l'histoire où celui qui ose dire que deux et deux font quatre est puni de mort.

— La Peste, Albert Camus

The pneumonia epidemic caused by an unknown pathogen started on December 8, 2019;¹ on December 31, Chinese health authorities reported to the World Health Organization (WHO) a series of cases in the city of Wuhan, Hubei Province, China.² The WHO responded quickly by coordinating the development of the diagnosis, providing guidance on patient monitoring, sample collection and treatment, and by updating the information on the outbreak.³ Most cases were epidemiologically associated with a market in Wuhan where live animals are sold (Huanan Seafood Wholesale Market), which suggests a possible zoonotic origin (transmission from animals to humans).⁴ On January 7, 2020, isolation and identification of the pathogen was achieved using next-generation sequencing in samples of bronchoalveolar lavage fluid from a critically ill patient.^{5,6}

On January 12, 2020, the Chinese authorities shared the complete genome sequence of a new viral strain of the *Coronaviridae* family, which was initially called 2019-nCoV.⁷ Previously, six coronavirus species that cause human infections were known; two of them, the severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), are zoonotic microorganisms that cause severe acute respiratory infections, usually fatal.⁸ 2019-nCoV was found to

belong to the betacoronavirus 2B lineage, to have formed a clade within the *sarbecovirus* subgenus, *Orthocoronavirinae* subfamily, and to share 82 % of genomic sequence with SARS-CoV.^{9,10} Because of this, this coronavirus was designated as SARS-CoV2. The explosive nature of the outbreak and rapid spread of the disease drew the attention of the international community.

In this context, there are two elements that are important to understand SARS-CoV2 rapid spread:

- The epidemic started in a country with more than 1400 million inhabitants (Wuhan alone has 11 million residents).
- It coincided with a substantial increase in the number of trips within China and abroad, around the Lunar New Year on January 25, 2020. (According to the National Development and Reform Commission of China, between January 10 and February 18, 2020, more than 3 billion passenger trips would have been carried out by all means of transport).¹¹

Information on the SARS-CoV2 outbreak has been generated and shared “in real time” thanks to new molecular diagnostic technologies and new information platforms. By January 31, 2020, 46 complete genomes were already available in public and private databases such as GenBank (<https://www.ncbi.nlm.nih.gov/genbank/2019-ncov-seqs/>) and GISAID (<https://www.gisaid.org>), with fully-developed phylogenetic trees and phylodynamic analyses. All this happens, fortunately, when most specialized scientific

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journals have already migrated to electronic formats on the Internet (many of them open access). Some medical journals are offering to share information with other publishing houses and with the WHO, even prior to publishing their final versions.¹² Websites specializing in infectious diseases and expert social networks, such as ProMED-mail (<https://promedmail.org/>) and Virological (<http://virological.org/>), have discussion forums on the subject; some academic (<https://www.worldometers.info/coronavirus/coronavirus-cases/>) and university (<https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd-40299423467b48e9ecf6>) efforts are spreading real-time information. All over the world, the coordinated efforts of academics from very diverse disciplines have been essential to ensure the timeliness and quality of information.

As of February 5, 2020, at least 24,554 cases and 492 deaths have been confirmed in 24 countries from five of the six WHO regions. The proportion of serious cases is 13.2 %, with a case fatality rate of 2.1 %.¹³ Incubation period has been estimated to be 5.2 days (95 % CI = 4.1-7.0).¹⁴ During the first weeks, the epidemic was doubling every 7.5 days,¹⁵ and the basic reproductive number was estimated at between 2.2 and 3.5.^{16,17} Since early December 2019, there is evidence of person-to-person transmission among close contacts;¹⁸ however, we still need more epidemiological information to integrate predictive models of the pathogenic potential, virulence and transmissibility dynamics of this new virus.

Considering the risk international spread of the SARS-CoV2 outbreak represents, and that a coordinated global response is required, the WHO Emergency Committee declared a Public Health Emergency of International Concern (PHEIC) on January 30, 2020.¹⁹ This decision means that the situation is serious, sudden, unusual and unexpected. PHEICs generate situations that negatively affect, in one way or another, large groups of the population, but they also represent an important opportunity to learn from diseases and pathogens, as well as from our strengths and weaknesses, to control them and respond to their occurrence.²⁰

As for Mexico, the Ministry of Health initially disseminated materials with general information on the status of the SARS-CoV2 epidemic. On January 30, 2020, the Epidemiological and Health Intelligence Unit, a focal point in our country for WHO's International Health Regulations,²¹ issued a preventive warning on travelling to the Hubei Province in China; every day, a

report with verified data from official sources is updated.²²

In operational terms, the National Committee for Health Security held an extraordinary session in order to activate the Technical Subcommittee on Emerging Diseases, which is the body responsible for establishing and coordinating the actions for preparedness and response in the health sector.²³ The National Epidemiological Surveillance System (SiNaVe – *Sistema Nacional de Vigilancia Epidemiológica*) published the "Standardized guidelines for epidemiological and laboratory surveillance of 2019-nCoV-related disease", a document that establishes operational definitions, prevention and control measures, handling of samples, a diagnostic algorithm and biological risk management in the face of the imminent emergence of this disease in Mexico.²⁴ As of February 5, SiNaVe has detected 10 suspicious cases, all ruled out by the Institute of Epidemiological Diagnosis and Reference, the first national reference laboratory to develop the methodology for the confirmation of cases in Latin America.²⁵ An article appearing in *Gaceta Médica de México* number 2 of 2020 reviews the development of the epidemic in the world and the prevention and control actions suggested in the country.²⁶

Since the appearance of SARS-CoV in 2003 and MERS-CoV in 2012, we have learned of a new coronavirus every decade. Communicable diseases caused by new coronaviruses most likely will continue to emerge in the future. Currently, there is no specific treatment or vaccine that prevents SARS-CoV2 transmission, and health workers represent a population at risk; therefore, it is important for biosafety measures to be strengthened in public health laboratories and all medical units as soon as possible.

All stakeholders involved in the response to this emergency –from clinicians (general practitioners and primary, secondary and tertiary care specialists), scientists (experts in virology, molecular biology and bioinformatics), the editorial community (authors, reviewers, editors) and public health specialists to the organized civil society– we all must collaborate with real-time knowledge and information in order for health authorities' decisions to have a real impact on public health.

The response of us all to the emergence of SARS-CoV2 must imply a deep sense of commitment and social action to the benefit of public health.

Conflict of interests

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