

## COVID-19: Perspectiva, lo que sabemos y lo que aprendemos

### COVID-19: Perspective, what we know and learn

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Received: 10 April 2020

Accepted: 25 April 2020

Published: 1 May 2020

**Keywords:** COVID-19, Coronavirus,  
perspectiva, epidemiology, experiences

**Palabras clave:** COVID-19, Coronavirus,  
perspectiva, epidemiologia, vivencias

**Citation:** Galvis PM. COVID-19:  
Perspective, what we know and learn. IJEPH.  
2020; 3(1): e-6230 Doi: 10.18041/2665-  
427X/ijeph.1.6230



ISSN: 2665-427X

Year 2020 made its debut with tension and uncertainty. For years, nations have invested in defense, politics, space and technology careers. Gadgets for making a bridge between humanity and the artificial have eclipsed, in their attractive catwalk, the gravity of consumerism and selfishness, to the detriment of the natural world that withers in a race against time. COVID-19 put a real stop to humanity, in the case of the respiratory infection caused by SARS-Cov-2 (1). It is a disease that slowly began to spread around the world, emerging only four months ago in China. China warned about the seriousness of the infection and its potential for expansion, generously deploying severe sanitary measures such as the construction of buildings dedicated to the exclusive health care of those who suffered it and militarily demanding the isolation of its people (2). The world remained expectant, innocent and indifferent. The fallacy of the hypothesis that what does not touch us will nor hurt us. Commercial flights, land and sea terminals remained open. The calls of compatriots were answered to return them home, in a so-called “humanitarian rescue.” Others candidly returned to their respective countries and regions to become index patient candidates.

As epidemiologists, we began to make personal bets and have discussions by way of speculation, doing academic exercises about the situation that we saw in front of us, deeply rooted in the culture of what does not touch us. The truth is that we do not defend a conviction of this generation: there are no limits. And what a lesson, that the Earth is indeed only one, and even the smallest of things (a virus) can make the most significant of differences (pandemic).

Scientists around the world did not take long to express themselves, from all the perspectives in which the knowledge gap in the face of the new virus could be addressed. Even so, the position that Covid-19 has put us in is well known to us. The novelty is that it had not been previously presented to our immune system. Due to the advances in molecular biology, just two weeks after its discovery, we knew its genetic makeup (3). On the other hand, epidemiology is a professional exercise where observation is refined and which allows us to expose the evidence supported from the logic and mathematics of a situation, approaching its origin, daring to model the course of a story and anticipating what will be its outcome, teaching us to learn from the past in order to infer about the future.

Other microorganisms have threatened and decimated humanity throughout our history. In the last two decades and also originating in China, SARS (2003) and MERS (2012) (4) emerged. International agreements to combat them were probably lax at that time, giving rise to our present. HIV, which the world no longer fears, and Ebola, whose fatality has not allowed it to leave Africa, are obligatory examples. Other outbreaks that are not so deadly, but which have demonstrated the fragility of our human condition, include those that occurred in Latin America with Chikungunya (2014) and Zika (2015) (5). All of these examples attest that we live in a constant battle. Did we learn to control them? Why does dengue continue to claim victims locally? Malaria and tuberculosis that affect large populations in “any” corner of the world, are still active.

From epidemiology, we know that to contain an epidemic, the mobility of the susceptible population must be limited. In this case, isolation is assumed for “everyone”, and cases must be dealt with until resolution, which is an apparently simple formula. It seems, however, that amid indifference from some and ignorance in others, many individuals out of freedom, vanity, need or selfishness undertook intercontinental trips. The sick began to be seen, with the first case in neighboring countries to China before the end of January and then hundreds of cases in Spain,

Italy, France, Germany, Canada and the United States (6.7), and soon in others countries distant from the place of origin. Multiple studies have been raised against Covid-19 in all branches of science (8), from the presentation of case reports, to cohorts of thousands of patients who have suffered it, revealing the common symptoms of the disease: fever, cough, shortness of breath, myalgia, lethargy (9). Allowing quickly the generation of protocols and methodologies in the intervention from suspicious asymptomatic cases to the management of patients in the ICU.

Given the lack of and end to this event, every minute counts and all questions are important, even those that do not generate results, because in science we allow ourselves to be a result too. The truth is that we are learning: theory is enough, but nobody expected the challenge of putting it into practice. National guidelines are limited at being successful in controlling this pandemic. Even more so when the national guidelines and health professionals did not have the necessary practical knowledge, only intuition and a lot of theoretical knowledge.

Studies were generated where the possibility of acquiring the disease on an airplane trip was demonstrated. No evidence was found, determined by a p-value, that infected passengers were the first contact of patients who eventually tested positive when sharing a one-hour flight, but they did find a relationship for those who shared it for three hours (10). Then the question arises: were the common contact elements such as doors, handrails, fomites, the transmission vehicles on this flight, or in a clinic? Are shared spaces such as the office or a public event important for transmission? And if so, how long does the virus stay active there? All this led to the determination of the hours and the kinetic curve in the decrease of viral particles given a concentration, a surface (glass, plastic, cardboard, etc.) and environmental conditions. From these questions, information began to be generated that today, after four months, help in making decisions to control the pandemic. Important debates between scientific societies and experts have arrived at positions regarding the use of masks, as we know that the virus can also be transmitted by aerosols, denying the theory without argument that the viral particle falls to the ground once it is outside the host (11).

Epidemiologists, having evaluated all the possible circumstances, ask themselves the question of how to protect the susceptible population. This virus is characterized by its omnipresence and its contagion capacity, but it is ironic that, despite all these drawbacks, the nature of the virus allows it to be eliminated by contact with such trivial and common elements as soap and water. This is one of the main strategies for its control: isolation and hand washing.

In order to mitigate the impact and prolongation of this infection, the exponential growth in the spread was studied, comparing it with past epidemics. Thus modeling the curves showing what the behavior of the disease would be in terms of its transmission capacity, mortality and the recovery rate, all of which depends on the size of the population and on the risk factors such as chronic or autoimmune diseases that are previously present the patient. Age (12) and being diabetic or specifically hypertensive (13), have been shown to be a determining factor for the prognosis regarding what the course of the disease will be in a specific population. There is still no treatment that is safely implemented and is expected to recover the health of the patient; chloroquine and hydroxychloroquine are candidates, with results that are hardly satisfactory on the clearance of viremia (2, 14) among the multiple therapeutic resources.

To reach a true inflection point, without speculation, or delaying the expectations of citizens who do not have to be experts on the subject, we must reach a collective commitment regarding social distancing, disinfection habits and many changes in their lives. It is necessary to have information that reliably declares what is the real magnitude of the cases of infection and the population at risk, for example in which sectors of the cities you are at greater risk. Details that accurately quantify mortality and recovered patients allow more accurate projections to be made, allowing more accurate health measures to be taken. This helps to quantify how many beds, how many of them are intensive care units, how many tests and how much talent in healthcare it takes to be victorious in this battle against a microorganism that we already know and that we now need to slow down and smooth the curve in the Gaussian bell (15). This is our challenge. Prolonging this top of the curve enough so that future vaccines will allow us to implement an immunization strategy, so that this pandemic ends, leaving behind just another chapter in our history.

Applauding the good will and professionalism of those who work for the health of Colombians every day, I must admit that there is a lack of public policies around contingency for events like this, in addition to a more effective organizational system. From my experience, it is regrettable that epidemiological health surveillance becomes a whole “gymkhana” in terms of locating a patient and following up on him. Applications have been emerging from technology that enable solutions to these problems. This means that if the political will exists, many health and social problems can be solved.

It is sad to be a spectator when some productive sectors - despite warnings from academia - make decisions that put the health of a sector of society at risk, but workers need wages to survive. It is a reality for many Colombians that if you do not work you may not get sick from Covid, but you still “need” to support your family and so it is not an option not to work. The lesson that this experience leaves us is that academics must have a more decisive position on health issues and participate from an equal position as decision makers from other sectors including political and economic. In addition, the request is clear: a real change in health policies is needed.

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