



ASSESSMENT OF POTENTIAL IMPACT OF COVID-19 ON THE VENEZUELAN POPULATION

The Venezuelan Academy of Physical, Mathematical and Natural Sciences alerts its fellow academies on the potential of COVID-19 to wreak havoc on the Venezuelan fragile health and social system.

1. Testing and reporting. The Venezuelan government designated the Venezuelan Hygiene Institute as the sole laboratory allowed to process samples of patients suspicious of COVID -19, despite the availability of other laboratories with RT-PCR testing capacity around the country. Specimens from all states are submitted to this lab for SAR-Cov-2 diagnosis using RT-PCR kits. Cases are updated by government officials every day or every two-days. Under this highly centralized testing strategy, the existing capacity will be shortly overwhelmed, if it is not so already. The first positive case was confirmed on March 13. As for today, 143 cases have been reported with three deaths. The confirmed case accumulation curve suggests a linear increment in the number of accumulated cases, a pattern that is atypical for the initial phase of the COVID -19 epidemics. However, modelling of positive cases from the first two deaths, a strategy used in other countries with suspected under-registry to estimate the number of accumulated cases¹, suggest that under a $R_0=1.2$ scenario and a mild case fatality rate (CFR) of 1%, this number exceeds 800. Official figures also indicated a recovery rate of 27% at day 9 from the initial case, an estimate that is also atypical based on the mean recovery time of 12.3 days estimated in Wuhan². This figure possibly masks inaccuracies in the case definition that need to be reviewed. As surveillance and accurate information dissemination to the public have been demonstrated to play a key role in the design and implementation of interventions that minimize the fatality rates, we believe that changes need to be urgently done to assure a reliable surveillance and reporting.

2. The health system. The Venezuelan health system is collapsed with most hospitals unequipped for handling COVID -19 patients. Hospitals lack of water, sanitizers or disinfectants or equipment required for protecting medical staff from getting infected and minimizing intrahospital contagion. On March 28, 60% of the health care system lack of face masks or soap. While government officials announced that Venezuela had an installed capacity of 1,213 beds with UCI for assisting critically ill patients³, an independent network of doctors, health care workers and epidemiologists presented a balance of only 84 beds with UCI equipment. If 10% of COVID-19 patients will develop severe symptoms that require hospitalization in UCI units, 840 positive cases will be enough to overwhelm the health system, a value that will be reached in few days according to the estimates shown above.

3. Population vulnerability: Undernourishment and food insecurity are additional risk factors that could exacerbate the impact of Covid-19 on the Venezuelan population. According to several reports from United Nations, one out of three Venezuelans (32.3%) is food insecure and in need of assistance⁴. Venezuela accounts for 22.1% of the undernourishment indices in Latin America⁵, and along with Haiti, are the only two countries that require external assistance of food⁶. Malnutrition has been considered as underlying cause of death associated with infectious diseases in developing countries⁷. Its impact on morbidity and mortality associated with acute respiratory tract infection (ARI) has been demonstrated, particularly in children⁸. This suggests that Covid-19 could have a higher than expected fatality rate on the Venezuelan population, particularly in children.

4. Interventions. While government announced a series of quarantine measures on March 13, in an attempt to reduce contagion, the country's capacity to comply with these measures has been limited. Amid a four-digit hyperinflation and with a minimum wage estimated to cover less than 2% of their household needs, most Venezuelans have no economic capacity for accumulating food for few days. More than 80% of the population live day by day and, thus, need to get to marketplaces daily to assure some caloric intake. Moreover, in the last few weeks gasoline supply was reduced in 99%, severely impacting the food production, distribution and imports⁹.

Eighty-seven percent of food markets have reported supply shortages in the last few weeks⁹, forcing people to move further away from their confinement points or aggregate in the few well stocked marketplaces. Also, testimonies from the medical staff unable of getting to hospitals are increasingly frequent. While frequent hand hygiene has been recommended by the OMS to reduce contagion, only 11% of households have continuous supply of clean water⁹. Local governments and some private sectors are currently trying to assist the population, but the absence of resources and lack of support from the central government has made difficult the implementation of these programs.

Under the described conditions, we forecast a devastating impact of Covid-19 on the Venezuelan population. Emergency interventions by the Venezuelan government have primarily aimed at regulating the population behavior, but not at improving the health and epidemiological systems, the quality of basic services such as water, electricity and gasoline, or removing obstacles to food production, distribution and imports, all of which are equally important for minimizing the death toll of the Covid-19 pandemic in Venezuela.

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- 3 <<https://www.vtv.gob.ve/un-total-de-23-762-camas-hospitalarias-y-1-213-camas-para-cuidados-intensivos-activas-en-venezuela/>> (
- 4 World Food Program of the United Nations Venezuela. Food Security Assessment Main Findings. Data Collected between July and September 2019, <<https://reliefweb.int/report/venezuela-bolivarian-republic/wfp-venezuela-food-security-assessment-main-findings-data>> (2020).
- 5 FAO, IFAD, WFP, WHO, UNICEF. The state of food security and nutrition in the world 2019: safeguarding against economic slowdowns and downturns. (2019).
- 6 FAO. Crop Prospects and Food Situation. Quarterly Global Report No. 1. March 2020. Rome.
- 7 Rice, A. L., Sacco, L., Hyder, A. & Black, R. E. Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries. Bulletin of the World Health organization 78, 1207-1221 (2000).
- 8 Manandhar, S. R., Thorell, P., Kallur, I. & Joshi, S. K. Assessment of Malnutrition as a Risk Factor for Acute Lower Respiratory Tract Infection in Children under 5 yr Age at a Tertiary Hospital. Journal of College of Medical Sciences-Nepal 15, 107-111 (2019).
- 9 Encuesta Nacional Impacto Covid-19. (2020).

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