Global Health Day

The Global COVID Surveillance System: Policy, Persistence, and Transmission in Latin America and the Caribbean

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Background: SARS-CoV-19, the virus that causes COVID-19, is a global pandemic that has placed unprecedented stress on national economies, food systems and healthcare resources in Latin America and the Caribbean (LAC). This region has become an epicenter for the coronavirus, with Brazil and Argentina leading the region in caseload and deaths. Existing surveillance provides a proxy on COVID-19 reported morbidity and mortality; however, these measures make it difficult to identify shifts to the pandemic and changes in the speed and acceleration in COVID-19, or those cases that persist as a function of new cases last week. Accordingly, we provide an enhanced surveillance system to complement static metrics that inform when there are shifts in the pandemic, increasing rates, and where explosive growth is likely to occur in LAC.

Objective: This study aims to provide enhanced surveillance metrics for SARS-Cov-2 in addition to standard metrics that more accurately tracks shifts in the pandemic, speed, acceleration, jerk, and persistence in transmission. Enhanced surveillance will inform policy and COVID-19 outbreaks for leaders in LAC.

Methods: Using a longitudinal trend analysis study design, we extracted 45 days of COVID data from public health registries. We use an empirical difference equation to measure the daily number of cases in LAC as a function of the prior number of cases, the level of testing, and weekly shift variables based on a dynamic panel model that was estimated using the generalized method of moments (GMM) approach by implementing the Arellano-Bond estimator in R.

Results: COVID transmission rates were tracked for LAC during the weeks of 9/30-10/06 and 10/07-10/13. New cases in the region totaled 79,053 on 10/06 and 42,837 on 10/13. The 7-day moving average of new cases was 56,106 the week of 10/6 and 47,276 the week of 10/13. Total infection rate decreased from 12.42 to 6.73 accompanied by a death rate decrease from 0.33 to 0.24. Within the region, on 9/30, Brazil had the largest number of new cases at 41,906 followed by Argentina at 14,740, Colombia at 7,650, and Mexico at 4,828. On 10/07, Argentina had the largest number of new cases in the region at 13,305, followed by Brazil at 10,220, Colombia at 5,014, and Mexico at 4,295. For both weeks, Brazil had the highest 7-day moving average, followed by Argentina. The region saw a decrease in speed,

acceleration, and jerk the week of 10/13 compared to the week of 10/6, accompanied by a decrease in new cases and 7-day moving average. For the week of 10/6, Belize had the highest acceleration and jerk in the region, at 1.7 and 1.8 respectively, which is concerning given the high death rate in the country. The Bahamas had a high acceleration at 1.5. 11 countries had a positive acceleration the week of 10/6 whereas six countries had a positive acceleration the week of 10/13. The region is trending positively, with a speed of 10.40, an acceleration of 0.27, and a jerk of -0.31 all decreasing the subsequent week to 9.04, -0.81 and -0.03 respectively.