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

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Introduction/Background

- The COVID-19 global pandemic has placed unprecedented stress on the national economies, food systems and healthcare resources in Latin America and the Caribbean (LAC), as the region is an epicenter for the coronavirus with Brazil and Argentina leading in caseload and deaths.
- Existing surveillance systems make it difficult to identify shifts to the pandemic, changes in the speed and acceleration in COVID-19, and the cases that persist as a function of new cases from the previous week
- We provide an enhanced surveillance system that fill in the gaps 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.

Goals

- 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 than existing metrics.
- Enhanced surveillance will inform public health policy and COVID-19 outbreaks for leaders in LAC.

Methods

- 45 days of COVID data were extracted from public health registries via a longitudinal trend analysis study design.
- An empirical difference equation measured the daily number of cases in the LAC region 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.

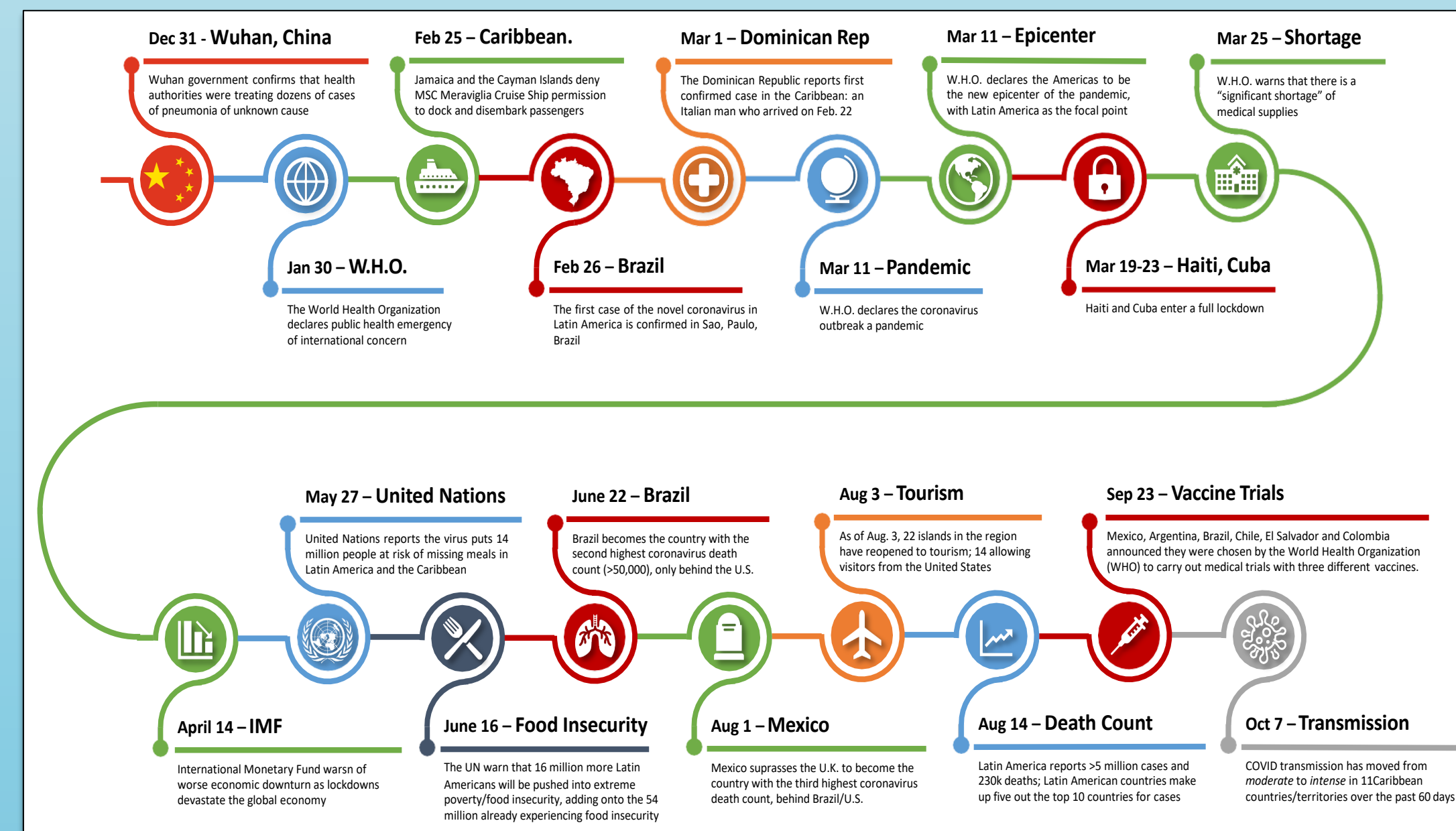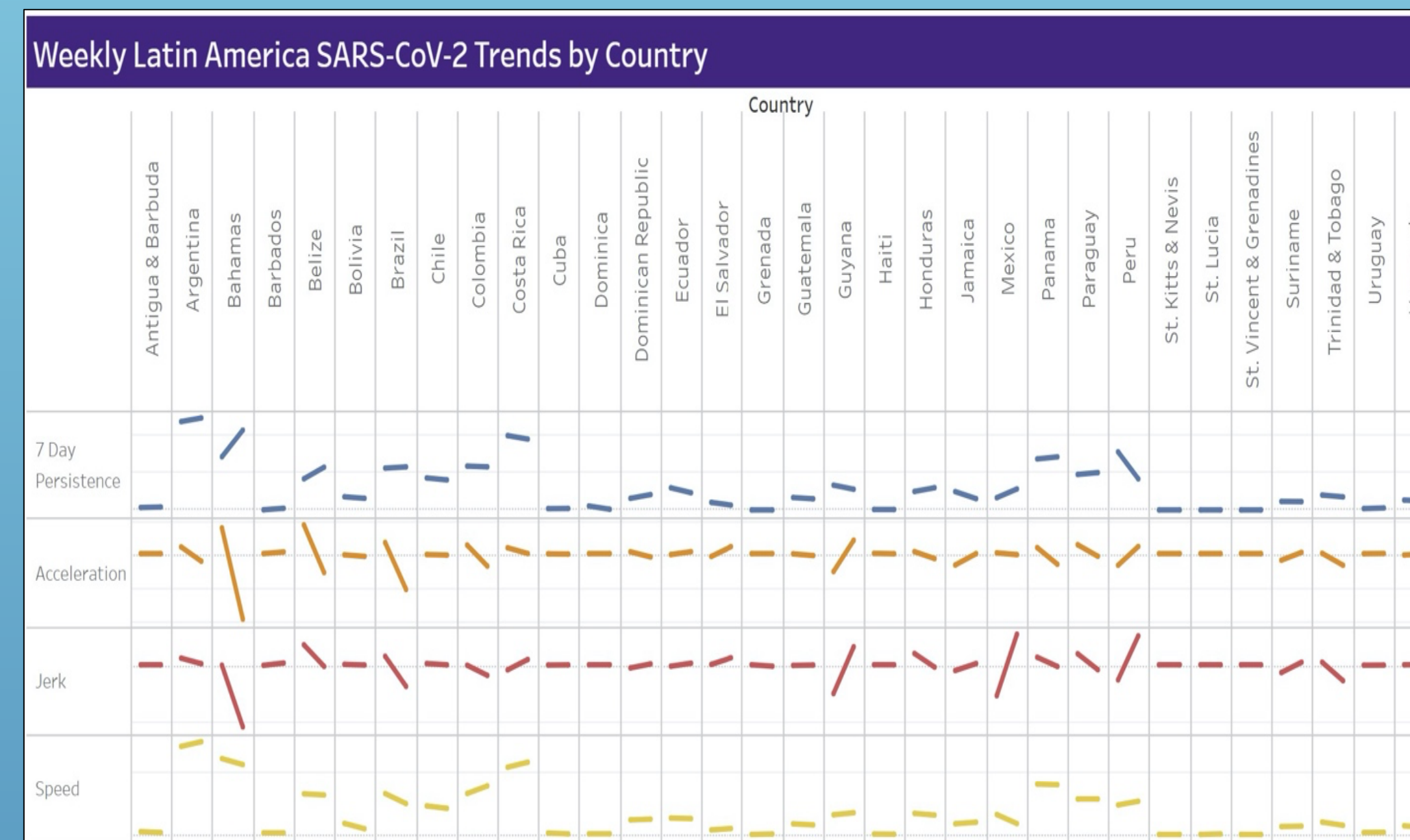## Table 1. Timeline of transmission throughout LAC

Table 2. Measurements of 7-day persistence, acceleration, jerk, and speed throughout LAC

Results

- COVID transmission rates in LAC for the weeks of 9/30-10/06 and 10/07-10/13.

	Week of 9/30-10/6	Week of 10/07-10/13
New total cases	79,053	42,837
7-day moving average of new cases	56,106	47,276
Total infection rate	12.42	6.73
Death rate	0.33	0.24

- Highest number of new cases by country on:
  - 9/30: Brazil: 41,906; Argentina: 14,740; Colombia: 7,650; Mexico: 4,828
  - 10/7: Argentina: 13,305; Brazil: 10,220; Colombia: 5,014; Mexico: 4,295
- Both weeks Brazil had the highest 7-day moving average, followed by Argentina.
- The whole region saw a decrease in speed, acceleration, and jerk from the week of 10/6 to the week of 10/13, accompanied by a decrease in new cases and 7-day moving average.
- 11 countries had a positive acceleration during the week of 10/6 whereas only six countries had a positive acceleration for the week of 10/13.
- The region overall 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.

Conclusions/Implications

- Although LAC saw an overall decrease in speed, acceleration, and jerk in addition to a decrease in new cases and 7-day moving average for the week of 10/13 compared to the week of 10/6, this is largely due to decreases in infections in Brazil and Mexico, which together contain over 50% of the population in the region.
- Brazil continues to have the highest 7-day moving average in the region, more than two times that of Argentina, the next highest in the region.
- LAC surveillance metrics suggest that the region is collectively trending slightly better, largely driven by increased control over COVID outbreaks in the most populous countries.
- Some countries such as Brazil and Argentina continue to struggle and are likely to give way to continued outbreaks without consistent measures to control the pandemic.

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