Analysis of IMSS essential service outcomes and quality since the Covid-19 pandemic
Date: November 23, 2021

Aim
To investigate the effect of the IMSS National Strategy for Health Services Recovery on essential health services

Data
Outcome data
Delegation-level summaries of health service use and outcomes per month from January 2019 through September 2021. Outcome data are described fully in the original analysis: https://gh.bmj.com/content/6/9/e006204.abstract

Time-related exposures
We define the following variables:

- Months since January 2019 (overall trend, continuous variable from 1 to 33)
- Start of the Covid-19 pandemic crisis in Mexico: 0 before April 2020, 1 from April 2020 onwards
- Months since Covid-19 began (trend during Covid)
- IMSS policies to restore essential services, increased service availability, trend: months since April 2021, 0 before April 2021
- IMSS policies to restore essential services, level change: 1 for April to September 2021
- Number of beds occupied by COVID-19 patients within IMSS per month
- Season

Analytic approach
We will use an interrupted time series design to estimate changes in service delivery following the April 2021 IMSS policy for service resumption, including a level change from April to– July 2021 and a slope change from April 2021 onwards.

We will use generalized estimating equation linear models with an identity link function. We will use variograms to visually inspect the correlation structure for serial correlation and calculate the quasi-likelihood under the independence model criterion (QIC) to identify the correlation structure with the smallest QIC (using the variog and qic commands).

We will not include a lag term for service utilization outcomes. We will include a 1-month lag for disease control outcomes (hypertension control, diabetes control).

To compare results across indicators with varying baseline, we will estimate average marginal effects using the margins command in STATA and report the level change in September 2021 (time = 33) as a risk ratio (RR). To visually assess indicators trends, we will predict average trends in the absence of the IMSS policy based on pre-policy observations and graph them against observed data.