The Ministry of Public Health and Social Assistance of the Dominican Republic publishes daily data on new COVID-19 cases, cumulated cases, and more. These are aggregated by province and available for download.

The steps carried out to get the map are described below. First, the actions were carried out using Pandas, and later the mapping using ArcGIS PRO.

Data wrangling

1. Excel:

Data were obtained in xls files. I inspected them visually using Excel and exported them to CSV for wrangling and cleaning using pandas.

1. Pandas:
   * Import CSV to pandas setting up an encoding that would recognize the 'ñ' letter and create the data frame.
   * Further inspection of the data using panda's functions: shape, info, head, tails, etc. With that inspection, the cleaning and tidying required by the data became evident.
   * Cleaning required the elimination of null values or invalid ones (e.g., negative values for positive cases). Some text data was cast to date type and int.
   * The table as it was imported did not comply with the 'Tidy data' requirements as some observational units were columns and not rows. This lack of proper shape was solved using the 'melt' tool. This table had the dates as columns instead of an attribute of each province; after the transformation, the table became larger in rows but coherent with what ArcGIS and any other program would expect (wide format). As the name of the provinces did not include coordinates, these were added using the library [Geocoder](https://geocoder.readthedocs.io/) and the [OpenStreetMap](https://geocoder.readthedocs.io/) API. Before that, the country's name was concatenated with the provinces' names to avoid toponym confusion.

Animation in ArcGIS PRO

* Import tables as a point feature class using from XYtotable
* Download a layer with the provinces of the Dominican Republic from the [National Statistics Office (Dominican Republic)](https://www.one.gob.do/) page. These two layers were joined spatially. The union was one to many.
* As the points were all located in the centroid of each polygon, the tool CreateRandom Points was used to create the cases within each polygon for each date. These points were made as separate points, not multipoints, and stored in a different feature class layer. This layer was then joined to the layer with the dates. Before that, the tool Dissolve was used to join them into multipoints (this option was not selected in the create random points tool because then points would lose their ID, and the union would not be possible).
* Go to layer properties and activate the time variable with the field storing the dates.
* Next was to create the animation. In the view Tab, animation group --> Create animation

This was my first time doing animations using ArcGIS PRO, and this is better explained with images: