Supplementary Online File 2:
A comparison of COVID-19 outbreaks across US Combined Statistical Areas using new methods for estimating R_0 and social distancing

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Contents

1 Introduction

This guide reports how to automatically run the different fitting procedures, collect the output and analyse the results. It describes:

- how to set up the folder with all the necessary files (Section 2)

- how to check the prerequisites and download/install the necessary parts (Section 3)

- how to set up and run the whole procedure (Section 4)

- the different output that will be created (Section 5)

- the analysis to be done using R (Section 6)

2 Project folder

Download the GitHub repository `https://github.com/LudovicaLV/Getz-Hubbard` which contains the Python scripts (AutoNMB.py and params.py) and the settings file (NMB_settings.dat). In addition, download the Dropbox folder (`https://www.dropbox.com/sh/jous6hx5t72vjff/AABnFV_nUDt5vt0-NVZUqMENa?dl=1`) of CSV data files with incidence and mortality data (CSA_120_days).

3 Prerequisites

3.1 Python

To check if Python is installed on your computer, open the terminal and type `python --version`. If Python is not found or the version is 2.X.X, you will need to install Python 3. To install Python 3 on your computer go to `https://www.python.org/downloads/release/python-386/`. Download and install Python 3 for your OS.

3.2 Python libraries:

Install the following Python libraries:

- Numpy (To install type `pip install numpy` in the terminal command line)

- Selenium (To install type `pip install -U selenium` in the terminal command line)

- Firefox runtime driver (download the appropriate .tar.gz or .zip file at the bottom of the page `https://github.com/mozilla/geckodriver/releases` according to your OS).

For Mac or Linux users:

- The downloaded binary, "geckodriver", should be put into one of the "$PATH" directories of your system. For example, "/usr/local/bin". Or you can make a directory under your home directory such as " /.local/bin" and put the "geckodriver" into the directory, then use command `export PATH=$PATH:$HOME/.local/bin` to append the directory to "$PATH". Then it should work.

For Windows users:

- Please follow this link:
  `https://www.softwaretestinghelp.com/geckodriver-selenium-tutorial/`.

3.3 Firefox

If you do not have Firefox already installed, download it from `https://www.mozilla.org/en-US/firefox/new/`, according to your OS.

4 Run setup:

The set up for the automatic runs is defined in the file params.py, which has the following structure.

```
# The data file
INPUT_FILE=XXX.csv'

# Number of days to include in each run phase
PHASE_DAYS=[14,30]

# Number of iterations
PHASE_REPEATS=[200,200]
```

Select your desired CSA and move the corresponding CSV file to the main folder. Change the name XXX of the INPUT_FILE in the params.py with your CSA name (example: "Atlanta__Athens__Clarke_County__Sandy_Springs_GA_AL_day41.csv"). Open the terminal, navigate to the project folder (using the "cd" command) and then run `python3 AutoNMB.py`. If you get any error message, please take a screenshot and share it with Nir (nirh@berkeley.edu) and/or Ludovica (l.luisavissat@berkeley.edu).

5 Output

Once the automated operation is terminated, you will find an Output folder, which will contain folders named after every CSA of the analysis. Each folder will have sub-folders named DateTime (date and time of the start of the procedure). Each of these folders will contain:

- Plots (folder): screenshots showing the final Web App window at the end of every fitting procedure

- results_log.csv (file): CSV file with errors, parameter values and simulation output

- VTables (folder): CSV files containing the whole model output, for each run, after each fit

  Structure: Output → CSA name → DateTime → folder Plots, file results_log.csv, folder VTables

Note: we are aware of an issue in the results_log.csv file in the error column, but the error is also saved in the VTables folder so we can find the error value there.

6 Analysis

The provided R code will save the plots with the following names, replacing CSAname with the actual CSA name (folder name). The following names are in order of plot creation (also added as comments in the R code). The plots of our analysis are shown in SOF3, for each CSA.

```
CSAname_cases
CSAname_error
CSAname_k
```

```
CSAname_c
CSAname_i
CSAname_p
CSAname_error_2
CSAname_son
CSAname_sin
CSAname_sfn
CSAname_ssw
CSAname_s
```