Lessons learned in the mobility study of the 2020 round in Spain

Marina Pérez Julián, Instituto Nacional de Estadística (INE), Spain

In the context of the upcoming 2021 census, when Spain will conduct a register based census, INE has made big efforts to obtain access to mobile phone data to complete the census product with daily and seasonal mobility estimates.

After several years of negotiations, in 2020 INE launched a pilot study together with the three main mobile network operators (MNOs) in Spain, referenced to different moments of 2019, prior to the Covid-19 pandemic, to check whether mobile phone data could be fit for purpose. The whole territory was covered. The country was divided into approximately 3,200 areas specifically designed for the project. INE received origin-destination data tables from the operators: a single square matrix measuring the average number of phones moving from area A to area B during the period of Monday 18 November to Thursday 21 November 2019. Similarly, the matrix was calculated for four specific days, one common Saturday in November 2019, 20 July, 15 August and 25 December. For the same week of November, the number of phones in each area every two hours was collected.

When this project was about to finish, in March 2020, the Covid-19 outbreak made us re-focus the work for some weeks. MNOs began to provide daily data on mobility. INE opened an experimental site at the beginning of April 2020 measuring the opposite phenomenon, "the absence of mobility", to help policymakers to monitor the containment measures during the state of emergency in Spain to control the Covid-19 sanitary crisis.

Eventually, the original project was published on July 20th, 2020. Many lessons have been learned thanks to this study.

These aggregated data related to telephones have a vast potential and permitted the measurement of daily mobility (commuting), seasonal mobility and population at day and night.

Considering antennas instead of GPS signals (based on mobile apps) may provide weaker location information, but on the contrary the coverage is almost complete. The results proved to be satisfactory to measure mobility for the 2021 census.

Cooperation between INE and the private companies works. NSOs may not fully control all the massive data, and may not have resources to do so, but can work closely with providers on the statistical methodology resulting in an advantageous synergy.