

# IPC2025 - Reconstructing the French Population at the Parish Level before the Revolution

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## ABSTRACT

This article describes a new dataset of French vital records for the late eighteenth century compiled by the authors using previous work by Eric Brian and completed with new archival material. We also describe a new methodology to link these pre-revolutionary administrative units to the communes created after the Revolution. This allows us to create an estimate of the French population before the Revolution based on both vital record counts and population figures from a later period. In this paper, we describe our methodology and present our first results.

Keywords: Historical Demography, Early modern French Population, Population modelling, Spatial Distribution

## PROPOSAL

Very little is known about the precise spatial distribution of the French population before the French Revolution. Ambitious demographic surveys led by teams of demographers and historians led by Louis Henry, Jean-Noël Biraben, and Jacques Dupâquier between the late 1950s and early 1980s have sketched a picture of the evolution of the overall French population, but the sample of data collected for these studies cannot give a precise distribution of the population.<sup>1</sup> Furthermore, the sampling strategy adopted for these surveys relied on the distribution of the French population in the early nineteenth century. The farther we move back in time from this known distribution, the less likely this sample is going to be representative of the total distribution of the population. In this study, we propose to create the first high-resolution population estimate for France in the eighteenth century. This estimate will offer a much stronger basis for future archival work aimed at collecting a more suitable sample of parish records.

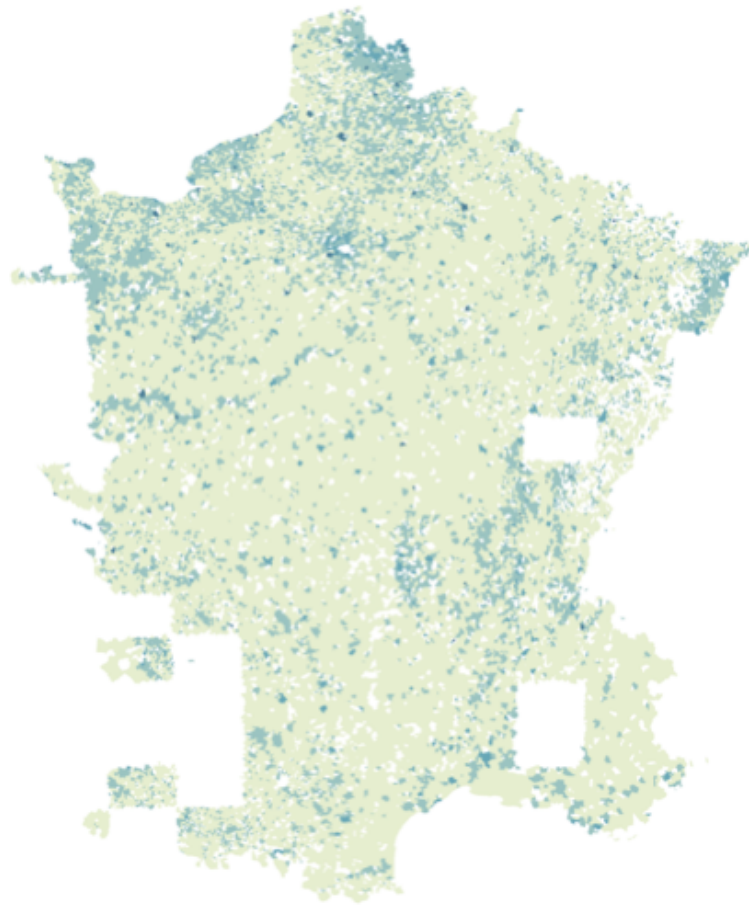
In order to construct this estimate, we used an administrative source from the late 1780s which lists triennial birth, marriage, and death (BMD) counts for eight tenths of all French parishes compiled by Éric Brian (2001). We complemented this dataset with new archival work conducted by the authors as part of their ANR-COMMUNES project to obtain a complete set of BMD counts for 1785, 1786, and 1787 for the whole of the French kingdom. This source is exceptional due to its extent and homogeneity, and it constitutes the first full series of vital record counts for the eighteenth century.

We then proceeded to link all these parishes to post-revolutionary communes, for which we have consistent population data from 1793 onwards. This work required the development of new algorithms for the matching of spatial entities. As a result of this work, we were able to link over 95% of all parishes to the ensuing communes.

We used these new geolinked data to create the first reconstruction of the French population, disaggregated at the parish level for the mid-1780s. Developing further the method described by Brian [ref. 2001], using our new data, we were able to create an estimation of the population for the Ancien Régime. The methodology we adopted relies on an estimator derived from a Principal Component Analysis (PCA) indexed on the population observed for each unit in 1793. This gives a first estimate of the population.

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<sup>1</sup>See Séguy (1998, 2001)



**Figure 1.** Population density in 1786

We empirically determined the inflection in the model performance curve, and segmented the dataset in five intervals, parishes with fewer than 1000, fewer than 5,000, fewer than 10,000, fewer than 30,000 inhabitants, and those larger than 30,000 inhabitants. We then treated the result of the first estimate as a series of discrete fitting problems and calculated an estimator for each interval. We then trained five random forest models (using B, S, B \* D and the PCA estimator) in each segment of 1793. These models were then used to predict the population, and we checked the ratio population estimated over population in 1793 for all parishes. Finally, we fit a Pareto distribution to the estimated total population following Barbut (1998).

In this paper, we will describe the data collected and explain the method adopted to build our estimate. We will also offer perspectives on future developments and discuss other potential avenues for creating population estimates from geolinked BMD data series.

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