

In this lecture we will discuss single imputation methods, i.e. methods where the missing data are imputed only once. We will start by examining simple methods, such as (group) mean imputation and ratio imputation. We will discuss cross-sectional and longitudinal versions of these methods.

Mean imputation and ratio imputation are special cases of regression imputation. In regression imputation missing values are imputed by means of a regression model. Regression imputation can be carried out in two ways: with a stochastic term or without a stochastic term. In the lecture we will discuss both options.

We will also examine hot deck donor imputation, where data from a selected donor unit are used to impute missing data in another unit. We will describe two approaches for selecting such a donor: random hot deck imputation, where a donor is selected randomly, and nearest-neighbour hot deck imputation, where a donor is selected by minimizing a distance function.

A further imputation method that we will discuss is predictive mean matching. Predictive mean matching is a hybrid method that first uses a regression model to predict values for the missing data of a unit and then uses these predicted values to find the nearest-neighbour donor.

We will briefly sketch how variances can be estimated for single imputation methods.

Data sometimes have to satisfy logical relations, for example the profit of an enterprise should equal its total turnover minus its total expenses. In other cases population totals may already be known, for example from an administrative data source, or have been estimated before. We will end the lecture with briefly sketching how single imputation methods can be extended so the imputed data satisfy logical relations and preserve known or already estimated population totals.