



Applications of Mixed Models Methodology for Small Area Estimation in Mexico

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The point of departure for this work is the request by the Government of Mexico for methodologies that provide reliable estimates of a wide range of deprivation indicators for every municipality in the country. The presentation will start by describing the specificities of this project and by defining the set of indicators whose publication is requested by law in Mexico.

Income-based indicators include the incidence of poverty and the poverty gap, inequality indicators such as the Gini coefficient and quantiles of the income distribution. Moreover, estimates of multidimensional deprivation are also requested. Multidimensional deprivation is jointly defined by income deprivation and deprivation in multiple social dimensions for example, health, education and social security. It is clear that for adequately responding to the breadth of this request, researchers in small area estimation must utilise a range of available and newly developed methodologies.

For estimating income-based indicators we consider the use of methodologies based on mixed models. In addition, we test a methodology, currently under development, that aims at explicitly estimating the distribution function of the outcome. This methodology is based on the use of a quantile nested error regression (mixed) model under the working assumption of an Asymmetric Laplace Distribution for the unit level error. One approach for estimating the measure of multidimensional deprivation Mexico is interested in is to consider this as a multinomial outcome. Provided that there is sufficient time, we will present results from using generalised linear mixed models methodology for this purpose.

The alternative methodologies will be compared by using real survey and Census data. Some diagnostic measures for externally evaluating the derived estimates will be considered.

Keywords: Discrete outcomes; Domain estimation; Inequality indicators; Quantile nested error regression;.