

**Title:** Measuring residential segregation in England and Wales : a model-based approach

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**Abstract:**

In this thesis, we propose an innovative model-based approach to the measurement and analysis of segregation. Historically, segregation has been measured using descriptive indices that provide summary measurements. We demonstrate that these indices are inherently biased. Further, they lack measures of statistical certainty, do not control for stochastic variation, are frequently aspatial, cannot cope with multiple scales and dimensions simultaneously and have no mechanism for the inclusion of explanatory models. We explore a multilevel modelling approach which remedies these issues and we argue that this approach is a more appropriate representation of the complexity of modern society. We illustrate the innovation using one of the traditional focuses of segregation research: the residential environment and analyse the changing residential segregation in England and Wales during the first decade of the twenty-first century. In these case studies we show that the residential segregation of benefits claimants has decreased during this period. Moving on to investigate the geographical inequality of mortality, we demonstrate that there is a great deal of stochastic variation in the raw data, and a further extension of the approach using a Poisson multilevel model is necessary to uncover the underlying trends. Conversely to common understanding the model reports no evidence of increasing inequality in the risk of mortality, that the highest levels of inequality were for those of working age and that the highest inequalities in the risk of mortality at the neighbourhood scales were found at the lowest end of the income scale. The final case study sets up a unique exploration of residential segregation by age, ethnicity and educational attainment in eight of the largest built up areas in the UK. We found the largest segregation was in the non-ESWI populations and those with low levels of educational attainment, along with a small decrease with age. All these findings were made possible by the flexible methodology proposed in this thesis.