**Measuring uncertainty in ONS population estimates: Tools, techniques and outcomes**

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The Office for National Statistics (ONS) in collaboration with the Southampton Statistical Sciences Research Institute (S3RI) at Southampton University has developed methods for estimating the uncertainty associated with the annually-published local authority mid-year population estimates. By ‘uncertainty’ we mean the quantification of doubt about the estimates. This research and the uncertainty estimates that we produce are intended to support decision-making by users of these key National Statistics. This year we published uncertainty measures for the 2012-15 local authority mid-year population estimates for England and Wales. This included confidence intervals for each local authority, and an estimate of the contributions that the 2011 Census, internal migration and international migration made to the uncertainty for each local authority.

The methodology involved a simulation approach which replicates the cohort component methodology used to create the mid-year population estimates. This presentation describes the methodology in more detail and provides some illustrative results. We are now conducting research to assess how these methods and results can be used to quality assure the research outputs from the Statistical Population Dataset (SPD). The latter are new population estimates created from administrative data. We will describe how uncertainty in the mid-year population estimates is helping us to i) create target quality standards for the SPD population estimates, ii) assess the quality of the current SPD research statistics and iii) develop direct measures of uncertainty for the SPDs.

Key Words: Uncertainty; Population estimates; Bootstrapping; Quality assessment; Administrative data

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