Volume 29 - Article 22 | Pages 579–616 ★

Validation of spatially allocated small area estimates for 1880 Census demography

By Matt Ruther, Galen Maclaurin, Stefan Leyk, Barbara Buttenfield, Nicholas Nagle

Download PDF Submit a Response Letter

Date received: 22 May 2013
Date published: 26 Sep 2013
Word count: 8730
Keywords: census data, small area estimation, spatial allocation
DOI: 10.4054/DemRes.2013.29.22

Abstract

Objective: This paper details the validation of a methodology which spatially allocates Census microdata to census tracts, based on known, aggregate tract population distributions. To protect confidentiality, public-use microdata contain no spatial identifiers other than the code indicating the Public Use Microdata Area (PUMA) in which the individual or household is located. Confirmatory information including the location of microdata households can only be obtained in a Census Research Data Center (CRDC). Due to restrictions in place at CRDCs, a systematic procedure for validating the spatial allocation methodology needs to be implemented prior to accessing CRDC data.

Methods: This study demonstrates and evaluates such an approach, using historical census data for which a 100% count of the full population is available at a fine spatial resolution. The approach described allows for testing of the behavior of a maximum entropy imputation and spatial allocation model under different specifications. The imputation and allocation is performed using a microdata sample of records drawn from the full 1880 Census enumeration and synthetic summary files created from the same source. The results of the allocation are then validated against the actual values from the 100% count of 1880.

Results: The results indicate that the validation procedure provides useful statistics, allowing an in-depth evaluation of the household allocation and identifying optimal configurations for model parameterization. This provides important insights as to how to design a validation procedure at a CRDC for spatial allocations using contemporary census data.

Author's Affiliation

Matt Ruther - University of Colorado Boulder, United States of America [Email]
Galen Maclaurin - University of Colorado Boulder, United States of America [Email]
Stefan Leyk - University of Colorado Boulder, United States of America [Email]
Barbara Buttenfield - University of Colorado Boulder, United States of America [Email]
Nicholas Nagle - University of Tennessee, United States of America [Email]

Most recent similar articles in Demographic Research

» Cohort fertility and educational expansion in the Czech Republic during the 20th century
Volume 38 - Article 56 | Keywords: census data

» State-level changes in US racial and ethnic diversity, 1980 to 2015: A universal trend?
Volume 37 - Article 33 | Keywords: census data

» More education, fewer divorces? Shifting education differentials of divorce in Taiwan from 1975 to 2010
Volume 34 - Article 33 | Keywords: census data

» Patterns of reproductive behavior in transitional Italy: The rediscovery of the Italian fertility survey of 1961
Volume 29 - Article 44 | Keywords: census data

» China’ s far below replacement fertility and its long-term impact: Comments on the preliminary results of the 2010 census
Volume 25 - Article 26 | Keywords: census data

Articles

»Current Volume

»Older Volumes

»Volume 29

»Editor's Choice

»Replicable Articles

»by Author

»by Subject

»Search

Citations

Cited References: 26

»View the references of this article

Download to Citation Manager

»RIS format

»BibTeX format

Similar Articles

PubMed

»Articles by Matt Ruther

»Articles by Galen Maclaurin

»Articles by Stefan Leyk

»Articles by Barbara Buttenfield

»Articles by Nicholas Nagle

Google Scholar

»Articles by Matt Ruther

»Articles by Galen Maclaurin

»Articles by Stefan Leyk

»Articles by Barbara Buttenfield

»Articles by Nicholas Nagle

Jump to Article

Volume	Page

Volume	Article ID

- Articles
- Current Volume
- Older Volumes
- Editor's Choice
- Replicable Articles
- by Author
- by Subject
- Search

- Special Collections
- About Special Collections
- All Special Collections

- for Authors
- General Information

- Submission Guidelines
- Peer Review and Publication
- Copyright Information
- Review Process
- Submit a Paper
- Submit a Letter
- My Author Account

- for Readers
- Get Email Alerts
- How to cite DR

- About the Journal
- Purpose
- From the Publisher and Editor
- Who's Who
- Our Reviewers
- Contact Us
- Copyright & Legal
- Privacy Policy