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Short report

The convergent validity of three surveys as alternative sources of health information to the 2011 UK census

Joanna Taylor [a, *], Liz Twigg [b], Graham Moon [a]

[a] Geography and Environment, University of Southampton, University Road, Southampton SO17 1BJ, UK
[b] University of Portsmouth, UK

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ABSTRACT

Censuses have traditionally been a key source of localised information on the state of a nation's health. Many countries are now adopting alternative approaches to the traditional census, placing such information at risk. The purpose of this paper is to inform debate about whether existing social surveys could provide an adequate 'base' for alternative model-based small area estimates of health data in a post traditional census era. Using a case study of 2011 UK Census questions on self-assessed health and limiting long term illness, we examine the extent to which the results from three large-scale surveys – the Health Survey for England, the Crime Survey for England and Wales and the Integrated Household Survey – conform to census output. Particularly in the case of limiting long term illness, the question wording renders comparisons difficult. However, with the exception of the general health question from the Health Survey for England all three surveys meet tests for convergent validity.

1. Introduction

Small area health information highlights localised need for health services and community based care provision. As Luck et al. (2006) argue "it can be a powerful vehicle for improving the health of a community by both highlighting the existence of problems and opportunities for improvement. It can also guide local action in support of policy change" (p.979). National censuses have traditionally been one of the main sources of small-area health information. In the UK, as well as in other countries with census health questions, numerous academic publications attest to the importance of census health data as a source for small area studies of health inequalities (with examples including Barnett et al., 2001; Boyle et al., 1999; Cairns et al., 2012; Congdon, 2006; Haynes and Gale, 2000). As of January 2014 a total of 227 countries or areas have taken or will be taking a census between 2005 and 2014 (United Nations, 2014). Of the 79 censuses analysed by the United Nations (2010) the majority included questions on mortality (37%) and/or disability status (66%). A significant proportion of censuses now adopt alternative approaches to a traditional census based on full field enumeration, through the use of administrative records, a rolling census and/or survey supplements. Of the 121 countries surveyed 11 per cent reported using alternative methodologies prior to 2005 and a further 15 per cent have introduced new methodologies more recently (United Nations, 2013). Countries such as New Zealand and the United Kingdom are currently investigating options for future censuses. In the UK case the Office for National Statistics (the national statistical institute for the UK) launched its *Beyond 2011* programme reviewing the options for the future production of population statistics in April 2011. A census of the UK population has been taken every decade since 1841 (with the exception of 1941 and an additional census in 1966) (Stillwell et al., 2013) predominantly using a paper census form. March 2014 saw the publication of the final recommendation from the National Statistician and Chief Executive of the UK Statistics Authority – an online census of all households and communal establishments in England and Wales in 2021. She also recommended an increased use of administrative data and surveys in order to improve annual statistics between censuses as well as enhance the statistics from the 2021 Census, stating that this approach will "offer a springboard to the greater use of administrative data and annual surveys in the future" (Matheson, 2014, p. 11).

However, previous work by the *Beyond 2011* programme demonstrated how any future increased reliance on annual surveys would be potentially challenging for the continued provision of

* Corresponding author.
E-mail address: j.l.taylor@soton.ac.uk (J. Taylor).

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small area data. Even if a new compulsory survey interviewed four per cent of the population annually, at least three years' data would be required to produce direct estimates for the small area geographies currently available via the traditional census (ONS, 2013a). Small area synthetic estimation could circumnavigate this problem by using statistical models that predict the probability of a 'target variable' using national surveys, but adjusting that prediction to take account of local area characteristics.

The purpose of this paper is to inform the debate as to whether existing rather than specially commissioned social surveys could provide an adequate 'base' for such estimation techniques. We, focus on the UK 2011 Census questions on general health and limiting long term illness (LLTI) and begin by outlining three candidate surveys before moving onto describe their coverage of the two specific health questions. A methods section explains how we test for convergent validity between the census and the surveys. To conclude we explore the broader implications of our findings for the synthetic estimation of health status based on existing social surveys.

2. The surveys

Three surveys are considered – the Health Survey for England (HSfE), the Crime Survey for England and Wales (CSEW) and the Integrated Household Survey (IHS). These were chosen to exemplify a specialist health survey, a specialist survey on a non-health related issue and a larger-scale general household survey. We focus on the 2011 runs of these surveys.

The 2011 sweep of the HSfE, commissioned by the Health and Social Care Information Centre, was the 21st annual survey and interviewed 8610 adults and 2007 children living in private households and achieved a core household response rate of 66 per cent (NatCen Social Research, 2012; NatCen Social Research and UCL, 2013).[1] The survey covers public health trends, the proportions of people who have specific health conditions and the prevalence of risk factors associated with these health conditions.

The CSEW (ONS, 2013b),[1] known as the British Crime Survey until recently, was first conducted in 1982, however, since 2001/02 it has been conducted continuously with the survey asking adults living in private households about their experiences of crime in the year preceding the interview as well their views on crime and criminal justice issues. It also includes questions on health status as part of its generic demographics module. The 2011/12 sweep achieved a sample size of 45,930 with a response rate of 75 per cent (TNS BMRB, 2012).

The 2011/12 IHS is comprised of a core suite of questions from three ONS household surveys – the Annual Population Survey (which itself combines results from the Labour Force Survey (LFS) and the English, Welsh and Scottish LFS boosts), the Living Costs and Food Survey and up until December 2011 the General Lifestyles Survey – and currently represents the biggest pool of UK social data after the census. It encompassed 350,000 respondents and covered themes such as education, migration, housing and employment as well as health (ONS, 2012b).

3. General health

A question on general health was first asked in the 2001 Census. The question has helped inform the Department of Health and (former) NHS Primary Care Trusts decisions on the allocation of health resources at local and national level with data on general health being found to be a strong predictor of the higher utilisation of health service resources (ONS, 2010). The question has also been used to facilitate research on a broad range of topics, including area level health resilience (Cairns et al., 2012) and patterns of worklessness (Bambra and Popham, 2010). The wording of the 2011 Census question on general health was: "how good is your health in general?" with the possible answers being "very good", "good", "fair", "bad" and "very bad". This is the recommended harmonised question wording for use in (government) surveys (ONS, 2011a) and is copied exactly by all three surveys under investigation in this paper, with different topics preceding and following.

ONS (2011a) states that the general health five point scale can be dichotomised with "very good" and "good" being classified as "good health" and the remainder being grouped together as "poor health". ONS's justification for including "fair" in the poor health category emanates from evidence from the 2005 and 2006 General Lifestyles Surveys which found that more than half of those who

Table 1
Questionnaire wording for LLTI.

Source	Question(s) on LLTI
2011 Census	Are your day-today activities limited because of a health problem or disability which has lasted, or is expected to the last, at least 12 months? Include problems relating to old age. 1. Yes, limited a lot 2. Yes, limited a little 3. No
CSEW	Do you have any of the following long-standing physical or mental health conditions or disabilities that have lasted or are expected to last 12 months or more? IF NECESSARY: Please include those that are due to old age 1. Blindness, deafness or other communication impairment 2. Mobility impairment, such as difficulty walking 3. Learning difficulty or disability, such as Down's syndrome 4. Mental health condition, such as depression 5. Long-term illness, such as Multiple Sclerosis or cancer 6. Other long-standing health condition or disability 7. None of these Does/do your health condition(s) or disability/ disabilities mean that your day to day activities are limited? Would you say you are … 1. Severely limited 2. Limited but not severely 3. Or not limited at all?
HSfE	Do you have any long-standing illness, disability or infirmity? By long-standing I mean anything that has troubled you over a period of time, or that is likely to affect you over a period of time? 1. Yes 2. No Does this illness or disability/do any of these illnesses or disabilities limit your activities in any way? 1. Yes 2. No
IHS (APS component)	Do you have any health problems or disabilities that you expect will last for more than a year? 1. Yes 2. No
(Other components' question wording same as HSfE)	Do these health problems or disabilities, when taken singly or together, substantially limit your ability to carry out normal day to day activities? If you are receiving medication or treatment, please consider what the situation would be without the medication or treatment. 1. Yes 2. No

[1] The original data creators, depositors or copyright holders, the funders of the data collections and the UK Data Archive bear no responsibility for their further analysis or interpretation.