Time for a fresh start: the case for a UK Population Register

David Coleman

Summary

Few aspects of UK population statistics are in a completely satisfactory state, whether relating to the numbers and condition of the people, the entry of foreign citizens and their numbers and distribution, the pattern of fertility or the projection of population or its components. Some are so poor as to be barely usable. The controversies over the 1991 , 2001 and 2011 censuses, the problems afflicting internal and international migration data, the consequent great uncertainty and disputes over local authority population sizes, are widely accepted. A population register would resolve most of these problems.

Current sources of data

Population and migration statistics in the United Kingdom are not very satisfactory and in the opinion of some Parliamentary Committees, in some areas unfit for purpose. The chief source of national and local population totals and characteristics of the people is still the decennial census, a source increasingly abandoned by advanced countries elsewhere (Coleman 2013) although endorsed in a report of the House of Commons Science and Technology Committee (2012). The lack of timeliness in the census, and its rapid obsolescence, is its chief drawback.

There are particular problems with the measurement of migration and migrants. The most widely used statistics on migration are based on relatively small (about 5000) voluntary samples of intentions, of incomplete coverage and high sampling error, supplemented by other sources none of them intended for the purpose. The House of Commons Select Committee (PASC) stated (2013) that 'Migration statistics produced by the Office for National Statistics (ONS) and the Home Office are blunt instruments for measuring, managing, and understanding migration to and from the UK. They are not accurate enough to measure the effect of migration on population, particularly in local areas, and they are not detailed enough to measure the social and economic impacts of migration, or the effects of immigration policy' and that the International Passenger Survey (IPS) was 'not fit for the purposes to which it is put'. It was last held in 2019. In 2016 the House of Commons Public Accounts Committee complained that the Home Office's e-borders programme, intended to give complete and timely data on passenger movement, had cost over £1 billion, was 8 years late and would not give the expected result, noting that: complacency about progress to date increases our concerns about whether the programme will be completed by 2019 as the Department now promises, and whether tangible benefits for border security, transport carriers and passengers will result'.

Except for the census year – once per decade - we have no statistics purporting to be complete on the numbers in the country, where they are, when they arrived and none on if and when they left. The number of illegal immigrants is (inevitably) highly uncertain; official guesstimates are above half a million. Internal migration and local population estimates depend on ageing and sometimes wrong census counts, on sample surveys (e.g.

the Annual Population Survey) too small for accurate local authority use and indirect, partial estimates from doctors' registrations. Good government, personal and national security and the prevention of crime and fraud are not well served by these arrangements. Recent interest in benefit or health tourism, and in the need to register the interests of EU citizens in the UK as Brexit approaches, have sharpened attention on the need for the establishment of entitlement Current systems, devised in a different era, have reached the end of the road and some may be beyond effective reform.

2. Administrative data

The Office for National Statistics (ONS) has been trying hard to put this right. Good progress is being made to use other sources of official data ('administrative data'), gathered routinely and regularly for non-demographic purposes from most or all of the population, to generate alternative, accurate and timely counts – not estimates – of the population and its characteristics at local and national level. To replace the census such sources would need to provide data on population totals (not estimates), household and family data, population and household characteristics, data on housing. At present these data are in separate administrative sources. Crucially to provide census-type information these sources need to be accessible, linked (as the household and individual census questionnaires do, on a single form) in a way acceptable to the public, and the process affordable. The Digital Economy Act 2017 makes straight the way to the first aim. It enables the ONS to access information held by different government departments, other public bodies, charities and large and medium-sized businesses, for statistics and research purposes – remarkable powers which appear not to have been controversial.

3. Following a recommendation from the National Statistician, a letter in 18 July 2014 from the Rt. Hon Francis Maude MP Minister for the Cabinet Office and Paymaster General to Sir Andrew Dilnot, Chairman of the UK Statistics Authority, confirmed that the next census in 2021 would be online and, although still in most respects a conventional census, would make use of administrative data, and that the intention was to base subsequent censuses substantially on administrative data. That would permit some data to be presented more frequently than with the decennial census and might- if public opinion allowed – new data for example on income to be incorporated. All this is very encouraging, going hand in hand with the declared aim in the 2015 strategy for UK statistics (UK Statistics Authority 2015) to provide a firm statistical evidence base for official decision making on sound evidence, and inform democratic debate with data known to be trustworthy. An initial aim is to provide by 2020, using administrative data and a population coverage survey, annual estimates of the size of the usual resident population by age and sex for national, local and small areas and components of population change (births, deaths and migration). That is done by matching individuals across multiple datasets using various combinations of name, sex, date of birth and postcode. An elementary requirement, strangely lacking initially, is a complete list of occupied addresses.

4. Data have now been released on occupied addresses in England and Wales using administrative data (the NHS Patient Register, the Department for Work and Pensions Customer Information System, the English and Welsh School Census and Higher

Education Statistics Agency data). The address records on the different administrative datasets are sorted into one correct and comparable address through a standardised address identifier; the unique property reference number (UPRN) now given to all residential addresses in England and Wales (ONS 2015?). A mammoth and complex task. 'Occupied addresses' are similar to, but not the same as 'households' as defined in the census on shared facilities) plus communal establishment, not covered by the household census. Households estimated from administrative data are about 6% fewer than households as enumerated in the 2011 census (ONS 2017b).

5. These proposals do not amount to the population register which this paper proposes. As envisaged at present it would also require a survey of population and household totals and characteristics, and some non-government information (see ONS 2017). The International Passenger Survey or something like it would still be needed for information on intentions of those arriving and departing, and their reasons for migration (these would also be needed if a population register were to be set up}.

6. Only a comprehensive population register can restore accuracy, timeliness and trust to population and migration statistics at local and national level. Having abolished the identity card scheme of the Labour government and the limited register that lay behind it, a proper population register is not - yet - on offer. In deciding – contrary to earlier ministerial pronouncements – to hold a census in 2021 we are heading for another unsatisfactory compromise. We should learn from Jersey, which introduced a population register in July 2011[1], and an increasing number of countries in many parts of the world that have already introduced modern registration systems (Table 1). Government ministers need to think again, and make Britain's population statistics fit for the 21st century and the challenges of Brexit.

A continuous population register

7. Instead of patching up existing systems, we need a continuous population register for all UK residents. It would be based on a unique person-number (PN) on lines long familiar in some Scandinavian countries, in Belgium, Israel and others (NCHS 1980) and in a less developed form in Austria, Finland, France, Iceland, Germany, the Netherlands, Switzerland and elsewhere (see Salt et al. 1994). The ONS Integrated Population Statistics System (ONS 2003) seemed to be moving towards a version of that, but most of its ambitious elements have been dropped. The first serious proposal for a modern register in the UK in recent times was made by Redfern (1990, 2004, 2007). The person-number would be assigned at birth to each child, or to each person naturalised or accepted for long-term residence, and would be unchangeable. It would be a unique identifier on all other records; NHS, DVLC, welfare payments, tax, state pensions and national insurance. A number of ways could be imagined of developing such a system (Birch 2007) to be minimally intrusive and compatible with British expectations. It would not require any information that is not already collected and stored electronically except that relating to house-data moves.

[1] http://www.thisisjersey.com/2011/07/07/registration-cards-for-work-and-housing/

8. **What do they do abroad?** In most countries with registers, the records are kept by each local authority (counties in Sweden; municipalities in the Netherlands) and centralised electronically in the national statistical office, the central records being updated regularly, often weekly. Usually there is a separate register for aliens (non-citizens). In the UK case, given the serious weakness of data on immigration and immigrants, that would be one of the most valuable innovations. Belgium maintains one National Register including all Belgians and resident foreigners, together with Belgians living abroad. An extract from the register relating to foreigners only (with additional information) constitutes a National Register of Aliens and Residence Permits. In the Netherlands the 489 municipalities are responsible for maintaining local registers of Dutch citizens and (separately) non-Dutch citizens. There is no central register as such, but a 'virtual' register whereby all the municipal registers are linked automatically by a secure electronic post-box maintained by and also linked to the Ministry of the Interior. That linkage enables national totals to be derived regularly (Salt et al.1994; Prins 2000, Poulain et al. 2006) with the greatest of ease.

9. Originally the registers were entirely local, in Sweden from the 18th century. Centralisation only became possible in the 1960s with the development of electronic computers. Once that was possible, a huge advance was made in the maintenance of timely and accurate national demographic information for every kind of public policy need, not to mention considerable advances in epidemiological and demographic research.

10. **The person-number and its UK surrogates.**
A person number (PN) is typically a number of ten-digit or more indicating the date of birth and sex of the individual, a unique individual number and a check digit or digits that ensure that the PN has not developed an error. Thus in Sweden the PN 450410-1488 indicates a woman born on April 10th 1945 with the individual number 148 and check digit 8. All administrative records relating to that individual carry that number.

11. In the UK some elements of this are already in place. There is already a 1universal person identifier. All births in the UK (and legal immigrants) have had a birth number assigned to them through the NHS system which tracks all their medical records and follows them as they move around the country through the computerised NHS Central Register at Southport (Hornsey 1993). In default of much else, it is the chief sources of information on internal migration, albeit an unsatisfactory one. It is not, however, used outside the NHS. The Central Register can only give information on moves between the 100 (former) Health Authorities, and only when patients choose to (re)register. That can involve considerable delay.

12. However, each such authority holds a register of patients with local GPs. That Patient Register includes the NHS number, sex, date of birth and postcode. With these, the Office for National Statistics can create a register for the whole of England and Wales. Linking records using the unique NHS number, persons who change their postcode from one year to another can be identified, enabling much more detailed, if still incomplete and late internal migration estimates to be made for small geographical areas (Chappell, Vickers

and Evans 2000; ONS 2003). The National Insurance number (NiNo) is a near-universal number increasingly used as a general identifier for persons aged 16 and over, for tax and other purposes. That already goes well beyond the scope of its original function.

Opportunities thrown away?

13. The UK has already introduced compulsory registration – twice. Both were provoked by wartime emergency. In both, identity cards were compulsory. The first (1915 – 1919), relating to the adult population only, was introduced to establish the number of men available to join the armed forces. That having been established (1,413,900), official and public interest waned in both card and register - there were no further incentives for keeping or using it. The system was put to sleep in 1919. In 1929 the then Registrar-General, Sir Bernard Mallet (1929) revived the idea of a register based upon much broader arguments, some demographic, others related to the protection of individual entitlement. That fell on deaf government ears. The second emergency scheme, much more successful, involved the creation of the National Register in September 1939, in preparation since 1938 in anticipation of war. That involved a register and a simple identity card containing basic details including the unique identity code (e.g. ASEO3 followed by the surname). 65,000 enumerators distributed and collected 12 million household schedules. The Central National Registration Office near Southport issued identity cards to all 47 million residents, except sailors and servicemen, all completed between the 5th and 29th September (Registrars-Generals, 1939). Information collected was modest: name and address, sex, date of birth, marital condition and occupation. The unique birth number associated with the Register became, with modification, the NHS number mentioned above. This system worked quite well, not the least because Registrar-General Sylvanus Vivian built into it an incentive that he called 'parasitic vitality'. The ID card entitled the bearer to the then rationed food supplies: no ID card, no rations (Agar 2005). National Registration continued after the war without much controversy except concern about the use of the cards by the police, and some worries about 'function creep'. It only ended in 1952 following a change of government (food rationing did not end until 1954). An incoming Conservative government abolished identity cards a second time in 2010.

14. Had far-sighted proposals made to Parliament in 1753 by Thos. Potter MP come to fruition, Britain could have had a population registration system for the last two and a half centuries. If developed, that would have given us a far superior system for managing population, health and welfare data than we currently enjoy. The 18th century was a time of great population controversy. With no census and no analysis of the parish registers, controversy reigned insoluble about the size of the population: whether increasing (as it was) or declining (Glass 1973). Thomas Potter's was the most sensible of the remedies proposed. An annual local count of population, and a record of all marriages, births and deaths would be taken on a secular, not a religious basis. The centralized results would give annual local and national totals of population and vital events - similar to schemes begun around the same time in Sweden and elsewhere. The Bill passed in the Commons by 57 votes to 17 despite opposition on religious and libertarian grounds. But at Second Reading in the Lords, it was referred to a Committee for a date outside the session and accordingly lapsed. England and Wales had to wait for a second-best system: until 1837

for the civil registration of vital events; until 1841 for a satisfactory household-based decennial census.

\How might a modern register work in the UK

15. Apart from the Person Number (PN) linking administrative records, the major innovation would be to create a register of all residents, local or centralised, including the PN and listing basic individual data, for example: name, address of principal residence; citizenship, date and place of birth, civil status, age and sex. Responsibility for maintenance would most obviously be with the local authorities but it could be run centrally as the late National Identity Register for the Identity Card was to have been. The register would be linked through the PN to administrative datasets such as the NHS Central Register, the National Insurance register, local authority rating lists, DVLA and, where eligible, the register of electors. The new register could replace some of those or remain as a link. The person-number would be the passport for access to education, to NHS services, to the welfare system and to pensions. The register would not need an ID card. (Enterprise Privacy Group 2005) although its efficiency would be enhanced with one.

16. A separate sub-register would be needed for non-naturalised foreigners, with information on immigration status, connected to immigration and to Home Office records. In Sweden there are different stages of PN related to immigration status, showing the entitlement of the bearer to limited or full welfare and health care rights. For timely and complete national data, the information on the local registers would need either to connect regularly to a central register or with all the others in a decentralised network as in the Netherlands.

No need for an ID card

17. The now defunct National Identity Register proposed for the Identity Card initially existed to support the Identity Card, with minimal information and no demographic function, intended to combat crime, illegal immigration and terrorism. The register proposed here would be the basis for a population system for public policy ends, surely improving security but not created to that end. And it would not require an ID card: they are not compulsory in most countries with population registers, for example in Austria, Finland, France, Italy, Luxembourg, Netherlands, Portugal and Sweden. Denmark's register has no ID card at all (Table 1). A useful and more complete review or these issues can be found elsewhere (Redfern 1990).

Advantages of a Population Register

19. The novelty of a population register consists in the Person Number and its formal linkage to birth and death registration and various databases. We already need an NHS number, a NiNo, other numbers for vehicle licensing (74% of persons aged 17 and over in England in 2013) and TV licensing (97%) and for the local authority and domestic services. At present each operates under a different system. But 'function creep' has already arrived. For example NiNos were originally introduced for National Insurance contributions and payments. Now they have become the reference number in PAYE taxation, to ensure that individuals do not exceed their entitlement in applying for

Individual Savings Accounts (ISAs), to prove entitlement to work in the UK for foreigners and to establish entitlement to vote in Northern Ireland. In short, they are taking on more and more of the functions of a register of adults, but without comprehensiveness, transparency or security. NiNos can be obtained easily by fraud. As the official website proclaims 'See how easy it is to get a National Insurance Number by filling in a few details. You can get your NI Number quickly without any hassle'. http://www.nationalinsurancenumber.org.uk/

20. The PN would not of itself confer additional privileges, but would facilitate access to them and restrict it to those entitled to them. Without itself containing confidential information, through linkage it would connect individuals, without confusion, to whatever administrative databases (NHS, National Insurance, electoral register, vehicle licensing) were agreed by Parliament and certify their entitlement. But to check abuse such as health tourism access to service provision would need to be tightened up.

21. In order to generate population statistics, the PN would need to be linked to local authority address lists. That is nothing new. An address list is already essential for a census especially when (as in 2011) based on the post out-post back method. The UK Statistics Authority complained strongly about the inadequacy of the address list for the 2011 census and the inexplicable refusal of ONS to maintain it afterwards. http://www.epsiplatform.eu/news/news/uk_address_register_underpins_2011_census

Connecting the local authority lists would generate accurate national and local population data, providing correct and timely 'one number' information whenever needed. For that, residents would need to register when moving permanently to a new local authority and de-register from the old one. Such registration with individual service providers is already essential for local taxation and for connection to gas, water and electricity supply and (on different boundaries) access to the NHS and the franchise. For most of us, on moving house this happens automatically. De-registration from the previous LA could easily be made automatic, as in continental systems.

22. With linkage to birth and death registration (compulsory since 1837) regular national updates would replace the annual local and national mid-year population estimates currently obtained by rolling forward the data from the last census (with all its errors) with subsequent births, deaths and estimates of migration (with all their errors).

23. It would improve information on local migration and local population change. The present system relies on an un-coordinated combination of sources designed for other purposes, principally changes in NHS registration. Local authorities deliver education, council housing, planning decisions and social services. They are the prime customers of population information and the biggest claimants on the Treasury. Many are badly served by the census and wrong-footed by the unprecedented pace of migration, the most important component of population change at local authority level and, usually, national level.

24. Naturalised immigrants, and people granted leave to remain, would acquire a PN on a similar basis as others. A separate register or sub-section would be needed for shorter term immigrants (those given leave to enter for more than three months). The PN would be recorded on the departure and arrival of international migrants through e-borders. At present, that is an aspirational comment.

25. The PN would eliminate error from the electoral register, which omits some individuals and includes more who are not entitled. Until 2015, the electoral register relied entirely on unsupported statements on the annual canvass forms by the household reference person and those in charge of institutions. Now at least it requires individual action (at least in theory). With the new system, each individual would need to register themselves. The ability of household heads to fill in the form on behalf of others led to increasing abuse. In fact, with data on address, age and citizenship, the population register could replace the separate electoral register if boundaries could be reconciled given information on citizenship and age.

26. The Population Register would record legal civil status. At present, when a person's marital or civil status changes, the new marital status cannot easily be linked into any existing database because the person's date of birth is not recorded either on the "marriage entry" made at the time of marriage or the divorce form (date of birth in conjunction with full name is the most common identifier used to link demographic and administrative records). A Register recording civil status would confirm the declared marital status when individuals marry. On marriage, the Superintendent Registrar may require evidence of divorce but it seems often does not. That would minimise repeated "sham marriages" entered into to facilitate immigration. It would, however, impose extra requirement on marriages solemnised by the Anglican Church, where today the celebrant still acts as registrar, an anomaly since 1837. And at present marriage and divorce cannot be linked to the ONS Longitudinal Study, an important tool for epidemiological research. For individuals it would no longer be needed to preserve original certificates of birth, marriage and death that today need to be produced for a number of essential purposes including inheritance and Probate.

27. "Living arrangements" are now diverse i.e. married and living together, married and living apart, co-residential cohabitation, living alone (without a partner), living apart together, civil partnerships. Legal civil status affects benefits; a register providing up-to-date information would be invaluable. People who are highly mobile or living in more than one household, are especially prone to change households. That obstructs timely and accurate estimates of local population estimates. Accurate knowledge would minimise benefit fraud by people cohabiting or living apart together and sharing bills but claiming single parent status.

28. In the medium and long term the financial benefits would be considerable. A census (estimated cost £482 million in 2011, £210 million in 2001) would no longer be needed. In the short run, however, setting up a register would cost billions but the annual cost would diminish with each passing year. In the developed world, censuses are on the way out. The Netherlands held its last census in 1971 and relies on population registers and

surveys. In Sweden, where the last census was held in 1990, all 'censuses' starting with the 2005 census will be based entirely on population registers (Bruhn 2001, Coleman 2013).

Problems of a Population Register

29. Clearly whatever the eventual savings, the initial costs of a Population Register and the linkage of person-numbers with all administrative data would be substantial. The estimated cost of the cancelled National Identity Register and Identity Card was £4.6 billion, although an unknown proportion of that was down to the production of the card itself

30. Recent public-sector IT problems – the NHS computerisation, the Registrars' computerisation, e-government, on-line tax forms, have eroded confidence in the ability of UK Government agencies or their contractors to complete any major IT project. Even more, public confidence in security has been damaged by the carelessness with which HM Revenue and Customs, DVLA and other bodies have treated confidential data held on CDs. These problems did not arise from a lapse in security in the actual computer systems, but from undisciplined negligence in procedures for transferring confidential data using involving physical, not electronic data. Existing registers depend entirely upon secure hard wired links, not on shuffling CDs. There have been no scandals. Low confidence will remain an insuperable barrier to a population register until confidence is rebuilt.

31. Secure systems on a huge scale can be made to work. We take for granted that our credit card and PIN number will deliver money from ATMs, or purchase goods, in almost any country in the world in a few seconds. Several billion such transactions occur every year worldwide.

32. We already rely on several huge computerised national datasets (e.g. for National Insurance), which work well and do not leak data. Taken together they are more than three-quarters of the way to a national register.

33. Privacy issues are the most important stumbling-block, provoking powerful and effective opposition (Rose 1999, Watner and McElroy 2003, The LSE Identity Project). Resistance to such projects has created, *inter alia*, a considerable academic industry. Even without a population register or PN, proposed systems raise problems. For example, the data that were to be collected through the e-borders initiative would, at least in theory, enable the government and the security services to build up and possibly retain indefinitely all information on international movement by UK travellers; when, where to and for how long. Helpful to the security services, possibly alarming for the rest of us.

34. Systems similar to that proposed have been introduced successfully, and have worked well for decades, in a number of European countries that consider their arrangements to be the highest manifestation of human rights and freedom, and which certainly show no signs of obvious oppression, or of breach of privacy scandals. However, foreign systems cannot be imported piecemeal – the UK may not yet be prepared for all the benevolent

bureaucratic intrusions of Scandinavian state feminism, and a British system would be unlikely to be so elaborate. And the largest of the countries discussed here – the Netherlands – has 16 million people compared with the UK's 60 million. In India, however, an electronic universal population register with biometric data is well on its way to being established. A less happy example is that of China (see Coleman 2013). If we lack confidence in our ability to run very large national IT systems we could ask the Indians to do it for us.

Conclusion

35. Current systems of identity, demographic enumeration and immigration control are obsolete and reaching the limit of improvement. Some, such as the IPS, were designed for other purposes and were press-ganged into functions for which they were always ill-suited. Their inadequacy is sharply revealed under modern migration pressures. Patching and piecemeal improvement, patching together existing bits and pieces, makes our statistical systems resemble a beloved but clapped-out old jalopy, kept on the road by Polyfilla and rubber bands. Others, like the Census and mid-year estimates, are no longer 'fit for purpose' and have ignore the enormous potential of exploiting for the public good the potentials of modern electronic data handling.

36. Appropriate new systems for determining the number and condition of the people, especially in respect of local authority needs and knowledge of internal migration, have never been developed. The continuous raft of legislation and policy initiatives being implemented, cannot be properly evaluated through lack of reliable basic population data. That is what the population register and the person number would provide. The investment – and political will to make that investment – has been lacking.

37. Thanks to the obsolescence of current systems, some of the fog of the 18th century population controversy is descending again on 21st century Britain to cloud our knowledge of our population and immigration. In the longer run it is essential to set aside demographic tinkering and ingenious but inadequate estimation and take the opportunity offered by modern IT to restore the opportunity lost over two centuries ago, which more and more of our neighbours and competitors have successfully implemented. Otherwise we will deserve once again the pity for our inadequate statistics recorded early in the 19th century by the distinguished Belgian statistician Adolphe Quetelet:

'Lately at the [British Association] meetings at Cambridge ……. I heard from several distinguished persons that there was a general complain to the imperfection of elementary population documents in this country…It is indeed a subject of wonder to every intelligent stranger, that in a country so intelligent as England, with so many illustrious persons occupied in statistical enquiries, and where the state of the population is the constant subject of public interest, that the very basis on which all good legislation must be grounded had never been prepared; foreigners can hardly believe that such a state of things could exist in a country so wealthy, wise and great'. (Adolphe Quetelet, cited in the Report of the Fourth Meeting of the British Association, London 1835, xxxix, in Glass (1973) p.127.)

.

References

Agar, J. (2005) "Identity cards in Britain: past experience and policy implications." History and Policy. Policy Paper 33.pp. 13

An Act for Taking and Registering an Annual Account of the People and the Total Number of Marriages, Births and Deaths; and also the Total Number of Poor receiving alms from every Parish and Extraparochial Place in Great Britain. Geo III 1753. Hansard Parliamentary History of England XIV 1747 – 53) cols 1317 1365. In Glass 1973. pp 17-20.

Benton, P. and I. White (2003). "Looking Beyond the 2001 Census." Population Trends(113): 7 - 10.

Birch, D. (2007). "Making national identity cards work." Prospect (October 2007): 52 - 54.

Bowley, G. (2003). "The last census?" Prospect (92, November 2003).

Boyle, P. and D. Dorling (2004). "Editorial: the 2001 census: remarkable resource or bygone legacy of the 'pencil and paper era'?" Area **36**(2): 101- 110.

Bruhn, A. (2001). The 2005 population and Housing Census in Sweden will be totally register-based. Symposium on Global Review of 2000 Round of Population and Housing Censuses: Mid-decade Assessment and Future Prospects, New York, United Nations.

Chappell, R., L. Vickers, et al. (2000). "The use of patient registers to estimate migration." Population Trends(101): 19 - 24.

Coleman, D. A. (2013). The Twilight of the Census. Population and Public Policy: Essays in Honor of Paul Demeny. Supplement to Population and Development Review Volume 38. G. McNicoll, J. Bongaarts and E. Churchill. New York, Population Council**:** 334 – 351.

Diamond, I. (1993). Who and where are the missing million? British Society for Population Studies Annual Conference. Newcastle.

Diamond, I., O. Abbot, et al. (2003). "Key issues in the quality assurance of the one number census." Population Trends (113): 11 - 19.

Dumont, J.-C. and G. Lemaître (2005). Counting Immigrants and Expatriates in OECD countries: a new perspective. OECD Social, Employment and Migration Working Papers No. 25. Paris, OECD.

Duncan, C., R. Chappell, et al. (2002). "Rebasing the annual mid-year population estimates for England and Wales." Population Trends (109): 9 - 14.

Enterprise Privacy Group (2005). The Identity Project: an assessment of the UK Identity Card and its implications. London, London School of Economics Department of Information Systems.

Evans, H. Vickers, L. and E. Wright (2007) Using administrative data sources in the estimation of emigration. Population Trends 128, 33 – 40.

Fullerton, P. J. (2003). "A demographic statistics service for the 21st century." Population Trends (113): 32 - 39.

Glass, D. V. (1973). Numbering the People. Farnborough, Saxon House.

Glover, S., C. Gott, et al. (2001). Migration: an economic and social analysis. Home Office Research and Development Directorate Occasional Paper No 67. London, Home Office.

Home Office (2006). Control of Immigration Statistics United Kingdom 2005 Cm 6904. London, The Stationery Office.

Home Office (2007). Accession Monitoring Report May 2004 - September 2007 A8 Countries. London, Home Office Border and Immigration Agency.

Hornsey, D. (1993). "The effect of computerisation of the NHS Central Register on internal migration statistics." Population Trends(74): 34 - 41.

House of Commons Science and Technology Committee (2012). The Census and social science. Third Report of Session 2012–13. Report, together with formal minutes, oral and written evidence . HC 322. London, The Stationery Office.

House of Commons Public Administration Select Committee (PASC) (2013). Migration Statistics. Seventh Report of Session 2013–14. Volume I: Report, together with formal minutes, oral evidence. HC 523 [incorporating HC 1010-i, Session 2012–13] London, The Stationery Office.

House of Commons Committee of Public Accounts (2016). e-Borders and successor programmes. Twenty-seventh Report of Session 2015–16. Report, together with formal minutes relating to the report. HC 643. London, The Stationery Office.

Mallet, S. B. (1929). "Reform of Vital Statistics: outline of a system of national registration." Eugenics Review **21**(87 - 94).

National Center for Health Statistics (1980). The Person-Number Systems of Sweden, Norway, Denmark, and Israel. Vital and Health Statistics. Data Evaluation and

Methods Research, Series 2, Number 84. . Hyattsville, MD, National Center for Health Statistics.

ONS (no date) Implications of 2001 Census - why census shows fewer men. http://www.statistics.gov.uk/census2001/implications.asp

ONS (2003). Impacts and Implications of the Revision to 2001 Population Estimates. London, Office for National Statistics.

ONS (2003). Discussion paper: Proposals for an Integrated Population Statistics System. London, Office for National Statistics. http://www.statistics.gov.uk/downloads/theme_population/ipss.pdf

ONS (2003). "Report: Internal migration estimates for local and former health authorities in England and Wales 2002." Population Trends(113): 69 - 73.

ONS (2004). Results of 2001 census-based local authority studies. Press release 8 July 2004. London, ONS. pp. 4

ONS 2006 A One-Number Census: Census 2001 was the most accurate count of the UK population ever achieved. http://www.statistics.gov.uk/census2001/onc.asp

ONS (2006). Report of the Inter-departmental Task Force into International Migration statistics. London, ONS.

ONS (2007). Improved Methods for Population Statistics Revisions in 2007. London, ONS. http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14834

ONS (2007). International Migration. Migrants entering or leaving the United Kingdom and England and Wales. Series MN No.32. London, Office for National Statistics.

ONS (2015?) Occupied address (household) estimates from Administrative Data: 2011 and 2015

ONS (2017) Annual Assessment of ONS's progress towards an Administrative Data Census post-2021. This is ONS's second assessment of its ability to move to an Administrative Data Census in the next decade. https://www.ons.gov.uk/releases/annualassessmentofonssprogresstowardsanadministrativedatacensuspost2021

ONS (2017b) Occupied address (household) estimates from Administrative Data: 2011 and 2015

Pereira, R. (2002). "The Census Coverage Survey - the key element of a one-number census." Population Trends (108): 16 - 31.

Poulain, M., N. Perrin, et al. (2006). Towards Harmonised European Statistics on European Migration (THESIM). Louvain la Neuve, Universitaires de Louvain Presses.

Prins, C. J. M. (2000). "Dutch population statistics based on population register data." Maandstatistiek van de bevolking **48**(February 2000): 9 - 15.

Redfern, P. (1990). "A Population Register or Identity Cards for 1992? " Public Administration **68**(4): 505 - 515.

Redfern, P. (2004). "An alternative view of the 2001 census and future census taking." Journal of the Royal Statistical Society A **167**(2): 209 - 228.

Redfern, P. (2007). Memorandum submitted by Philip Redfern. Written Evidence submitted to the Treasury sub-Committee Report on Preparations for the 2011 Census. House of Commons Treasury sub-Committee: Preparations for the 2011 Census. HC 326-i. London, The Stationery Office**:** 4.

Registrars-General England and Wales, Northern Ireland and Scotland. (1939). National Register: United Kingdom and Isle of Man. Statistics of Population on 29th September 1939 by Sex, age and marital condition. London, HMSO.

Rose, N. S. (1999). Powers of Freedom: reframing political thought. Cambridge, Cambridge University Press.

Salt, J. (2007). International Migration and the United Kingdom. Report of the United Kingdom SOPMI Correspondent to the OECD 2006. London, Migration Research Unit, University College London.

Salt, J. (2007). International Migration Statistics: Surfeit or shortage? Royal Statistical Society Annual Conference. York, Migration Research Unit, University College London.

Salt, J., A. Singleton, et al. (1994). Europe's International Migrants. Data Sources, Patterns and Trends. London, HMSO.

Simpson, L. (2007). "Fixing the population: from census to population estimate." Environment and Planning A **39**(5): 1045 - 1057.

Smith, L. and A. Sharfman (2007). "Assessing the feasibility of making short-term migration estimates." Population Trends(127): 21-29

UK Statistics Authority (2015) Better Statistics, Better Decisions. Strategy for UK statistics, 2015 to 2020. London, UK Statistics Authority. https://gss.civilservice.gov.uk/wp-content/uploads/2012/12/Better-Statistics-Better-Decisions.pdf

Watner, C. and W. McElroy, Eds. (2003). National Identification Systems: Essays in Opposition, McFarland.

Woodbridge, J. (2005). Sizing the Illegal Immigrant Population in the UK. Home Office Online Report 29 / 05. London, Home Office.