

The Study of Migration based on the Statistics of the 2001 Census

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Abstract: The purpose of this paper has been to set out the experience of the writer in using statistics from the 2001 Census to study migration and travel-to-work patterns in and around the City of Stoke-on-Trent. We explore the shortcomings and advantages or disadvantages of the available statistics, discuss what they are measuring, what they meant to measure and whether or not they are fit for purpose. The conclusion is that for the study of migration the Census has the shortcoming of being just a snapshot at one particular point in time. Suggestions are made that might make the Census more dynamic.

Acknowledgement: During the course of the study I have assistance from many individuals, but I wish in particular to mention the friendly help received from the staff at ONS whose advice has been invaluable.

Introduction

Migration within and to and from the North Staffordshire Conurbation has been the subject of intense study over many years starting with the preparations for the Structure Plans in the late '60s and early '70s. Similarly, travel-to-work patterns have been reported upon several times over the years. In the past it has always been the axiom that people were leaving the conurbation because of lack of job opportunities. Recently details about migration patterns have been included in a 'Housing Market Assessment'¹⁾ based on an earlier study by Peter Lee et al ²⁾ which together with this present study shows the picture to be far more complex than that.

It is also worth noting that migration to and from this area historically has been very low, perhaps giving rise to a general notion of parochialism. However, since the area's economy was overwhelmingly dominated by the ceramic and allied industries a person from outside knowing little or nothing about this industry would find it difficult to find a job here. Conversely, since there was little ceramic industry elsewhere a person from this area whose skills, knowledge and expertise was based on ceramic manufacturing would not have much incentive to move away, at least not beyond travelling distance.

A study based on the migration statistics in the 2001 Census has been conducted with the purpose to find out what the current patterns are and how they have been influenced by the development of industry and housing in various locations.

The purpose of this paper is to set out the experience of using the 2001 Census for this purpose. We will seek to explore the advantages and disadvantages of the available statistics. We will also discuss what exactly they are measuring, what they are intended to measure and whether or not they are fit for purpose.

The purpose is not to discuss the accuracy of the Census in a scientific (numerical, statistical or mathematical) sense. Rather, the paper focuses on the nature of the Census as conducted, the concepts and classifications used in the various tables and the relationships between the tables e.g. between tables on persons and tables on households.

Definitions of Migrants

A migrant is a person with a different address one year before the Census to that on Census day.³⁾ The 2001 Census differs from previous censuses in that it includes children of less than one year of age. The status of such children is determined by the migrant status of their 'next of kin' (usually the mother), other related person or the Household Reference Person.

It became necessary to obtain advice on the term 'group reference person' (which has not been included in the published volume on Census definitions). ONS provided the following definition:

"A moving group is a group of people within a household or communal establishment who have moved together from the same usual address one year before Census day. A person who moves by himself or herself also constitutes a moving group.

A household is described as 'wholly moving' if all members of the household are migrants and have moved from the same address. Where migrants do not constitute a complete household, they will be classified within 'Other moving groups'.

The term 'Moving Group Reference Person' is built up from 'Family Reference Person' (FRP) and 'Household Reference Person' (HRP).

In a Lone Parent family, the FRP is taken to be the lone parent. In a couple family, the FRP is chosen from the two people in the couple on the basis of economic activity (in priority order: full-time job, part-time job, unemployed, retired, other). If they have the same economic activity, the elder of the two is the FRP (if same age, the first member of the couple on the form).

The HRP is a term that replaces 'Head of Household' from 1991. A person living alone is the HRP. If the household contains only one family, the HRP is the same as the FRP. If there is more than one family in the household, the HRP is chosen from the FRPs using the same criteria as for choosing the FRP (economic activity, age, order on the form). If there is no family, the HRP is chosen from the individuals using the same criteria.

Finally.....if there is only one person in the Moving group, that person is the Moving Group Reference Person (MGRP).

If the moving group contains the HRP, then the MGRP is the HRP. If the HRP is not in the moving group, the MGRP is chosen from among any FRPs using the same criteria (economic activity, age, order on the form). If there are no FRPs or HRPs in the moving group, the MGRP is chosen from the highest generation (generation 1) of any family, using the same criteria.

If there is no person in generation 1 of a family, the MGRP is chosen from all the people in the moving group, using the same criteria."

The Census is by nature a static one-stop statistical snap-shot of the Country as at census day. It provides information about people and their social and economic circumstances at that time and no other. In terms of migration this means that we know about people's circumstances in their present place of residence and where they lived one year ago, but we do not know what their circumstances were then.

When in Table 3 below we find that more people who are self-employed are leaving than are coming in, it means that there were 191 people who lived in the city one year

ago, who are now self-employed and living somewhere else. We can not tell from Census statistics what their circumstances were when they lived in the City and it does not necessarily mean that the City is losing self-employed people through migration.

Tables & Datasets

The two main datasets and tables in the 2001 Census that give details of migrants and migration are shown in the Appendix. One part is contained within the main Census tabulations and gives characteristics of migrants in their new (or existing, if not moved within the last year) place of residence. The other is part of special datasets known as special migration tables, which deal with population flows from an area of origin to an area of destination. Together with the special workplace tables these are also known as double geography tables.

Within these datasets there are three sub-sets containing various degrees of detail in their descriptive characteristics. There are special sub-sets for each of the three main areas of analysis, output areas (OAs), wards and districts including unitary authorities. The smaller the number, that are involved in a tabulation, the fewer the details that can be included. The degree of detail therefore decreases with the size of the geographical area in question. A tabulation based on OAs will therefore contain less detail than a tabulation based on wards.

In addition different levels of geography and different datasets use different descriptive details. For instance Standard Table 8 dealing with age-structure at ward level uses categories 15 years of age, 16-17, 18-19, 20-24, 25-29 etc whereas Census Area Statistics Table 8 dealing with age-structure in Output Areas uses categories 0-9, 10-19, 20-64 and 65+. This makes it difficult and sometimes impossible to compare different levels of geography with each other, eg an Output Area with a ward.

Smaller areas can be joined together to form larger areas, but the descriptive detail will be limited to that applicable to the smaller area.

However, the student should be aware of the footnote to table CS008: “4. Because of the nature of migration, tables cannot be aggregated above Output Area.” An aggregation will tend to underestimate the people who “lived at the same address or moved within the area” and overestimate the number of migrants. This warning is not repeated in tables CS009 or CS010 and a similar warning does not feature in the Standard Tables, but presumably it is applicable at all levels. You cannot automatically aggregate this type of migration tables from one area level to a larger area say from Output Area to ward level or from ward to district.

There are differences in the issues dealt with in the main Census tables and the SMS tabulations which mean that some potential useful comparisons between the local/national situation and the local/sub-regional (selected origins and destinations) can not be made.^{4) 5)}

Within the main Census there are only three tables dealing with migration and migrants namely Standard Tables 8, 9 and 10 (Census Area Statistics Tables also 8, 9 and 10). The issues are number of people, age, gender and household composition. The SMS tables on the other hand also deal with issues such as economic activity, ethnicity and limiting long-term illness. If the two sets of tables have dealt with migration and migrants over the same range of issues, you would have been able to

compare a summary as in the main Census with an analysis of the same issues using your area of concern and selected areas of origin and destination.

Disclosure Control

“The Registrar General has a legal obligation not to reveal information collected in confidence in the Census about individual people and households, and has given public assurances about what this means in practice. In presenting very detailed results from the Census, protecting individual information is of key importance”⁶⁾ – “and disclosure protection measures are used to prevent the inadvertent disclosure of information about identifiable individuals ... “⁷⁾

Some details cannot be disclosed as it would assist people with intent to extract information on individuals, but a few pointers are available on the ONS website.⁸⁾ They were the subject of a lengthy debate between representatives of the users who were worried about the effect on Census output and the ONS whose obligation to protect confidentiality is paramount.

Three separate measures have been used:

- Thresholds for the release of an area table only if it contained a certain minimum number of residents and households.
- Record swapping whereby a sample of records from one area was swapped with similar records from another area.
- Small cell adjustments.

The small cell adjustments mean a small cell count (and how a ‘small cell count’ is defined is not disclosed) is rounded to the nearest or next nearest multiple of 3. Totals and subtotals within the same table are calculated as the sum of the adjusted data, but different tables are independently adjusted. This means that counts of the same population may not necessarily be the same and tables for higher geographical levels will not necessarily be the sum of the lower geographical component units.

The study that was done of migration in and around Stoke-on-Trent and North Staffordshire and a variety of statutory and non-statutory areas relied heavily on comparing different datasets and tables and on using Output Areas and wards to build larger areas. A user representative engaged in the said debate commented: “I expect that the analyses most vulnerable to rounding are those that use migration and workplace data and any analyses treating the Output Area data sets as building blocks for larger areas and discerning the geographical patterns of social change.”⁹⁾

During the course of the study, it was found that in the age-group 65+ more people were moving out of the sub-region (231) than were moving out to the whole of the UK (206). This would obviously be wrong, but I also found the difference too big (11-12%) for comfort and I sought advice from ONS customer services. This was their response:

“To your query, this is an unfortunate consequence of small cell adjustment. The figures from S008 are the hard count, and will reflect the true number in the data. You are right in surmising that this number (reflecting the whole of the UK) should be greater than to the subregion.

However, the latter figure is made up of a sum of a large number of LA to LA figures. These origin-destination figures are generally small numbers, even at local authority to local authority level. Small counts are adjusted to protect against disclosure (as are small counts in all our tables) but should be unbiased. However, this can have the effect when summing large numbers of adjusted figures, since on occasions numbers may be adjusted to much higher or much lower figures than the 'true' figure, simply by statistical chance. This appears to have occurred in this instance. I would advise that the figure of 206 is the appropriate figure to use for out-migration to the rest of the UK, and that the figure for moving to the subregion is slightly less than that. I am sorry that I cannot be more precise than that."

That there is such a possibility of an unfortunate impact on the figures used in an analysis must obviously be borne in mind. However, I would contend that it would be almost impossible to ascertain whether the small cell adjustments and the other disclosure control measures have had any other effect on the information used in the study.

Phil Rees et al have made an investigation into the best way to overcome the uncertainty created by these procedures. Their aim is to find a method of estimating robust totals for people and households at Output Area level. ¹⁰ However, unfortunately, in their investigation: "Origin-destination statistics are not used because the population bases are either migrants ... or persons with a workplace ..." (Ibid, p29)

Tools of Analysis

The analyses contained in the study were made using the primary census analysis tool for local authorities known as SASPAC (Small Area Statistics Package) version 7.5, supported by Windows Excel. SASPAC provides the basic details and table structure and Excel enables the analyst to undertake further analysis, editing and manipulation

The Conclusions

The study dealt with several subdivisions of the City and the surrounding sub-region, but for the purpose of this paper it will be sufficient to consider some emerging conclusions affecting the whole City.

It is seen from Table 1 that there is a surplus of in-migrants in the age-group 16-24 and a deficit in all other age-groups. From Table 2 it is seen that there is a predominance of Couple Households amongst all migrants, but particularly amongst out-migrants. One Parent Families and Single Persons are two other large groups, but there are more of them among in-migrants than among out-migrants.

Table 1: Age of Migrants

	City of Stoke-on-Trent UA				
	In	%	Out	%	Net
All Migrants	6,350	100.00	6,799	100.00	-449
Aged 0-15	1,081	17.02	1,287	18.93	-206
Aged 16-24	2,178	34.30	1,981	29.14	+197
Aged 25-34	1,581	24.90	1,843	27.11	-262
Aged 35-64	1,347	21.21	1,479	21.75	-132
Aged 65+	163	2.57	206	3.03	-43

Source: Derived from 2001 Census, Special Migration Statistics Table SMS201

Table 2: Persons in Households

	In-migrants*		Out-migrants*	
	Number	%	Number	%
Total	<u>3,291</u>	<u>100.00</u>	<u>3,641</u>	<u>100.00</u>
Couple Households	1,848	56.15	2,428	66.68
1 Parent Families	460	13.98	423	11.62
Single Persons	876	26.62	616	16.92
Pensioners	107	3.25	174	4.78

Source: 2001 Census, Special Migration Table SMS102.

*To and from Sub-region only

Among economically active migrants there is a predominance of employees (Table 3), but more so among out-migrants than among in-migrants. The self-employed are a small group, but again there are more of them among the out-migrants. Conversely there are more unemployed and more students among the in-migrants than among the out-migrants.

Table 3: Economic Activity of Migrants

Migrants Aged 16-74	In-migrants		Out-migrants	
	Number	%	Number	%
-	2,767	100.00	2,805	100.00
<u>Economically Active</u>	2,096	75.75	2,118	75.51
Employees	1,667	60.25	1,733	61.78
Self-Employed	157	5.67	191	6.81
Unemployed	133	4.81	95	3.39
Ec Active Ft Students	139	5.02	99	3.53
<u>Economically Inactive</u>	671	24.25	687	24.49
Student	182	6.58	178	6.35
Other inactive	489	17.67	509	18.15

Source: Derived from 2001 Census, Special Migration Statistics table SMS105

In Table 4 ‘White Collar’ occupations are defined as the sum of: Large employers & higher managerial occupations, Higher professional occupations, Lower professional & managerial occupations, Intermediate occupations, Small employers & own account workers. ‘Blue Collar’ occupations are defined as the sum of: Lower supervisory & technical occupations, Semi-routine occupations, Routine occupations. One notices that there are many more people in ‘Blue Collar’ occupations and students among the in-migrants than among the out-migrants.

Table 4: Groups & Households with Group Reference Person in Occupation

Origin\Destination	City of Stoke-on-Trent UA		
	In-migrants*	Out-migrants*	Net
White Collar' Occupation	854	866	-12
Blue Collar' Occupation	840	653	+187
Ec Active FT Student	153	6	+147

Source: Derived from 2001 Census, Special Migration Table SMS204

*To and from sub-region only.

On the basis of these statistics a picture is forming, which shows a lot of people moving into the City as young, single, maybe unemployed, maybe students and possibly in insecure, low-paid ‘blue collar’ occupations. A larger number is moving out who will include children (aged 0-15) and parents (aged 25+) in couple households, persons who are employees, self-employed and may have acquired a better paid and more secure ‘white-collar’ occupation. The question now is: Are the two connected?

Concluding Discussion

The local authority of Stoke-on-Trent is a very disparate community with an old core of six industrial towns that were largely products of the industrial revolution, a number of large outlying post-war council estates, some newer private residential areas all interspersed with areas of a semi-rural character. Clearly it would be wrong to compare such an entity with a City Centre such as Manchester or Sheffield referred to by Allen and Blandy 11), but their description of people who have moved into live in such centres does have some resemblance to the findings described above.

Stoke-on-Trent along with other ‘minor’ cities (Allen & Blandy, p 8) has sought to rebrand itself by ensuring evening and night time activities that extends the vitality of its City Centre beyond normal working hours. This has involved the promotion of new facilities such as the Regent Theatre, extension of the Victoria Hall concert facility and a liberal approach to an expanding array of pubs, bars and restaurants and encouragement of residential development near the City Centre. It is clear that large tracts of the City near the Centre is capable of meeting a major requirement of city centre living that of “living within six to ten minute walk to key facilities, such as work” (Ibid, p 10).

On the basis of the Census we cannot describe those moving into Stoke-on-Trent as “young, single professionals that are well-paid” (Ibid, p 9). However, they are

definitely young and mostly single or childless couples and often students. When Allen and Blandy observe that “most tend to give up their city centre ‘experience’ in order to satisfy their ‘natural desire’ to move to the suburbs” there may also be a local parallel in the move at a later age to the neighbouring authorities of Newcastle-under-Lyme or Staffordshire Moorlands, which in many respects act as suburbs to Stoke-on-Trent.

Two scenarios seem possible. A: Does the City act as a vehicle for younger people without education, employment, family etc to get started in life and move on, who it might be desirable for the City to encourage to stay as some advocate.¹²⁾ Alternatively B: Is the City a magnet for a pool of unemployed, lowly skilled and probably lowly paid people, who need to have easy access to the services the City can offer, but who thereby add to the City’s already chronic social problems and make much regeneration and renewal efforts an uphill task without an end in sight.

Meen et al ¹³⁾ are concerned with economic segregation which has become a key objective of policy makers:”Faster progress ... to renewal ... with the aim to create neighbourhoods with a more sustainable mix of tenures and incomes”. (Ibid, p 1) They make the point that research is needed “to understand and quantify the underlying processes that lead to the observed spatial patterns” (Ibid). Their concern is “that segregated communities are, in some sense ‘natural’ outcomes, even if everyone agrees that integration is desirable.

Observed patterns of integration and segregation are the outcomes of the location choices faced by individuals and households which change over time, between people in different areas, and over the duration of peoples’ lifecycles. People choose to live in or move to a particular neighbourhood because it appears to them to satisfy particular personal and social needs at a particular point in their lives.

Referring to studies of the areas of Newbiggin Hall in Newcastle-upon-Tyne and Hulme in Manchester Meen et al refer to these processes when they observe that “analysis needs to be sufficiently aware ... of young households, forming families, requiring schooling, empty-nesting and then ageing” and how the local community needs to retain the flexibility to work for each of these different life-cycle stages (Ibid, p 54).

The migration that has taken place over the years in and around Stoke-on-Trent has probably led to a degree of segregation with the City itself housing a large number of less well off people while the better off have moved to the surrounding largely rural areas. At the same time it seems quite clear that the people who do move into the City are coming here because they have a particular objective in mind that they feel can only be achieved in the City environment. Likewise, the people who leave the City do so because they have a different set of objectives that cannot be achieved within the City.

It would have been useful to be able prove one or the other and in particular whether there is a link between the two set of locational decisions. However, as the Census and even the study by Allen and Blandy takes a static approach this is not possible. We know what people’s situation was on census day or (in the case of Allen and Blandy) at the time of the interview, but we do not know for certain what happened before or after.

Longitudinal Study

The ONS Longitudinal Study (LS) takes a longer term view of the population. It links Census and vital events data for a representative one per cent sample of the population of England and Wales.¹⁴⁾ In 1991, there were around 2,700 LS members resident in Stoke, of whom 290 had left the City by 2001. In 2001, there were around 2,500 members resident in Stoke-on-Trent of whom 225 were not resident in 1991.

It would be possible to do some analysis of the characteristics of those who moved into Stoke-on-Trent by 2001 or those who left after 1991, based on prior census characteristics. However, given the number of people in the sample there are limitations to the number and type of covariates that can be included in a frequency table.¹⁵⁾

The LS is also restricted in the analyses that can be achieved in that they have to be based purely on 1-year and 10-year migration ie place of residence in 1991 or 2000 compared with 2001. It collects information on people born on four selected birth dates and information on place of residence is collected on a 10-yearly basis at each Census for all members of the sample. The implication is that there is no annual migration information in the LS.¹⁶⁾

A list of 14 questions was put to the LS who then evaluated whether an answer was possible. Within the above constraints it would appear that most questions on age, household structure and socio-economic conditions can be answered. However, given that we here are talking about people whose circumstances are undergoing rapid change it is questionable whether the time spans of 1 year or 10 years are appropriate. One year seems too short, ten years seems too long. It does take more than one year to acquire a skill or an education that can be recognized by an employer and enable one to get an economic basis for starting a family, but not as long as ten years. Some medium time span say five years might be more appropriate.

Five Year Migration

The 1971 Census did include information on five year migration, but this has not been done in subsequent Censuses. The writer of this paper seems to remember that subsequent to the 1971 Census it was argued that people could not remember with certainty where they were or what they were doing five years ago and that the information therefore was unreliable. However, I have been unable to unearth any documentation on this.¹⁷⁾

It may be true that people cannot remember with certainty the precise details such as street address and postcode of where they lived five years ago, but surely most people can remember which city, town or village they lived in and is that not really all we need to know? Buying a new house, days of marriage or joining with a partner in order to set up a family or for business purposes, starting a new job etc are such monumental events in peoples' lives that surely they will be able to remember some details. Perhaps it is a question of phrasing the question right? When did you move into your present residence? Was it before ? Or after ? Or: How long have you lived at your present address? Less than ? More than ? Or give people a choice of alternative questions and answers. If they do not know the date, perhaps they have an idea about the period they have lived at particular address.

2011 Census, topic consultations

The Office for National Statistics has recently published an assessment of user requirements on the content of a number of questions in the next census including questions on migration.¹⁸⁾ It would appear that the concern of the consultees primarily centered around international migration which was not the subject of the study on which this paper is based and the ideas put forward here had not crystallised in the writers mind when the consultation took place. International migration and the nationality and legal status of migrants will be important issues to some policy makers, but are not a primary concern in urban regeneration.

The assessment considers the question on “Address One Year Ago” and a possible question on “Place of Birth”. Both of these will be of importance and the second question (which have not been asked in recent censuses) may shed some new light on population flows. However, both questions deal only with flows: ‘from where to where’. What would be more interesting to policy makers engaged in urban regeneration is the question of ‘why’ and ‘who’. Why do people leave a certain place in favour of another? Who and what are they when they arrive, but also who and what were they at the place they have just left? In order to assess demand for housing and certain services eg schooling in particular places it may also be of importance to get an idea of peoples aspirations for the future; what employment will they aim for and where do they wish to live?

A Dynamic Census

Society is changing more and more rapidly, people’s circumstances are changing more and more rapidly. If we are to get an understanding of the socio-economic drivers in these changes, we need population counts that reflect this, and we need population counts that can help us understand the role geographic places, towns and cities play in these changes. We need not only to ask people where they are now geographically and in socio-economic terms, but also where they were or have been at some point in the past, and where they expect to be at some point in the future, however tentative their answers might be.

The proposed ‘rolling censuses’¹⁹⁾ or the proposed ‘Continuous Population Survey’²⁰⁾ may go some way to answering such questions providing they do not take the ‘snapshot approach’ of traditional censuses. It could be done in one of two ways. Firstly, the same questions could be asked of the same sample of people at regular intervals, say five years, perhaps three times during their life time in the beginning, in the middle and at the end of a ten year time span. Secondly, in addition to questions about people’s situation here and now, questions could be asked about their situation say five years ago and their expectation for their situation five years hence.

Research would have to be done into which approach would be most acceptable to the public, the people having to answer the questions, and questions of confidentiality would have to be addressed. Consideration would also have to be given to which approach would be most likely to give an answer that would be useful and reliable in formulation of policies locally and nationally.

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Appendix

Main Census

Districts and wards, Standard Tables (ST):

ST008: Type of residence and sex and age by migration (people).

ST009: Age of Household Reference Person (HRP) and no of dependent children by migration of households.

ST010: Household composition by migration of households.

Output Areas, Census Area Statistics (CS):

CS008: Resident type and age by migration.

CS009: Age of HRP and number of dependent children by migration of households.

CS010: Household composition by migration of households.

Double Geography (SMS)

Districts

SMS101: Age by sex.

SMS102: Family status by sex.

SMS103: Ethnic group by sex.

SMS104: Limiting long-term illness by age.

SMS105: Economic activity by sex.

SMS106: Moving categories of migrants and migrant groups in households.

SMS107: Moving categories of migrants groups in households by tenure.

SMS108: Moving categories of migrants groups in households by sex and economic activity of group reference person.

SMS109: Moving categories of migrants groups in households by sex and NS-SEC of group reference person.

Wards

SMS201: Age by sex.

SMS202: Moving categories of migrants and migrant groups in households.

SMS203: Ethnic groups.

SMS204: Moving categories in households by NS-Sec of HRP.

SMS205: Moving categories in households by tenure.

Output Areas

SMS301: Migrants, sex and age.