

## **Population and Migration Statistics (PAMS) Committee (Scotland)**

### **Rebasing Population and Migration Estimates 2002-2010**

#### **Introduction**

1. This paper sets out plans and initial proposed methods for rebasing population and migration estimates for 2002 to 2010. Rebased population and migration estimates for 2002 to 2010 will be published in December 2013.

#### **Background**

2. There is a difference of 49,400 people to add to the total population of Scotland across the decade. It is difficult to unpick the reasons for the difference but the most likely reasons are to do with uncertainties around estimating migration and also around the Censuses themselves. More information on the differences and potential reasons for the differences are available in the [2011 census – Reconciliation Report – Population](#) on the National Records of Scotland (NRS) website. However it is likely that a reasonable proportion of the 49,400 may be migrants who have not been picked up entering the country, particularly from 2004 onwards, while there are also indications that the Long Term International Migration (LTIM) methodology in the first part of the decade underestimated migration to Scotland by a quantifiable amount.
3. There are also signs that a number of adult men were missed from the 2001 Census and that there may also have been some particular areas with undercount in 2001. While we therefore expect that some of the additional people found by the 2011 Census should have been present in the Scottish population from the start of the decade, we will aim to smooth their introduction gradually over the ten years to prevent sudden jumps in the sex ratio, average household size or population size. We do not propose to go further back than 2002 due to different sources being used in earlier decades and the complication of determining how far to go back e.g. 1991 Census or 1981 Census.
4. The difference of 49,400 people is not evenly distributed across the country. While most areas had a lower population in the rolled-forward series than in the Census, others had a higher population. This is likely to be due in part to missed internal migration between areas in Scotland and uncertainty around distribution of international migrants. Using the new international migration methodology across the decade should improve the distribution of international migrants, but no adjustments are currently made to the internal moves picked up on the NHS Central Register (NHSCR). Further work is planned at a later date to compare internal, cross-border and international migration estimates with information on address 12 months ago and other information from the 2011 Census. We also plan to use additional sources, for example, Higher Education Statistics Agency (HESA) data to improve migration estimates of students.

## **Proposed methodology summary**

- Assume no differences due to births and deaths
- Calculate new migration in- and out- flows based on LTIM and current methodology
- Attribute net difference due to international migration methodology changes / undercount to individual years at Scotland level
- Consider making Armed Forces adjustment in some areas (e.g. Moray)
- Do not make any adjustment for prisons differences
- Attribute remaining difference to censuses / internal migration / other and distribute evenly across year

## **International Migration Series (part A)**

5. Re-run the migration processing for the years mid-2001 to mid-2002 until mid-2009 to mid-2010 using the currently published LTIM estimates for these years (prior to 2007 LTIM was not used in the rolled forward series from 2001) and the new method of distributing international migrants. This should give a new migration series which is a) consistent with the published LTIM estimates, b) able to give a split for councils for international and Rest of UK migrants, c) separates Armed forces flows from Rest of UK flows and d) hopefully gives geographic and age-sex splits for migrants that brings the profile closer to that seen in the 2011 Census.

## **LTIM methodology impacts, International Passenger Survey (IPS) undercount & other differences: unattributable adjustment per year (part B)**

6. At Scotland level, we can assign the difference of 49,400 people to different reasons and hence to different years of the decade. In particular, methodology changes to the LTIM estimate only affected certain years, while undercount due to international migration is likely to relate to migration levels each year.
7. Certain changes made to the LTIM estimate methodology over the last decade (e.g. migrant and visitor switchers) would have led to a different estimate of total net migration had they been used throughout the decade. The impact of these changes on migration to Scotland have been assessed by Office for National Statistics (ONS) and were outlined in the 2011 Census Reconciliation Report – Population published in August 2013 in the table given below:

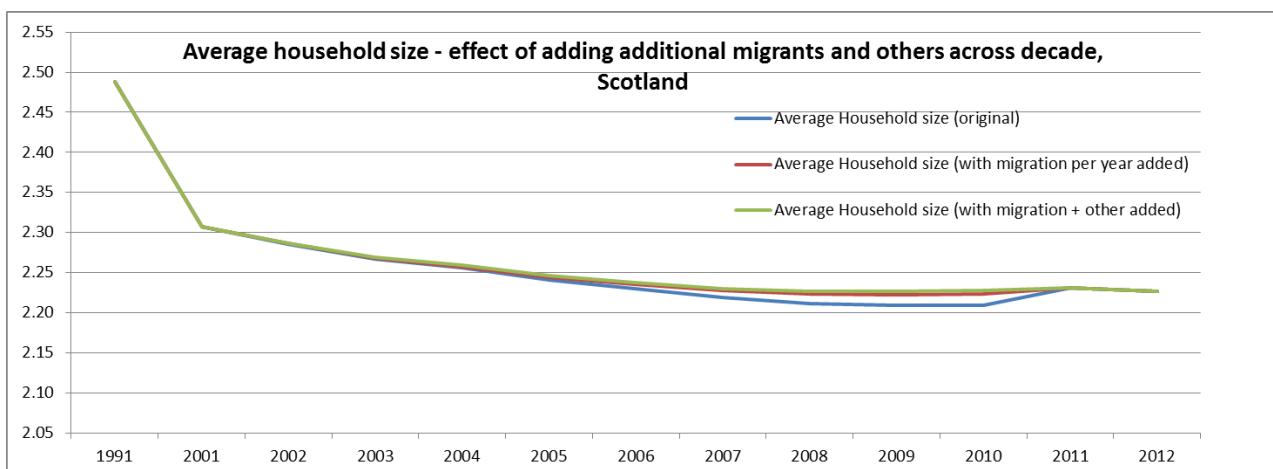
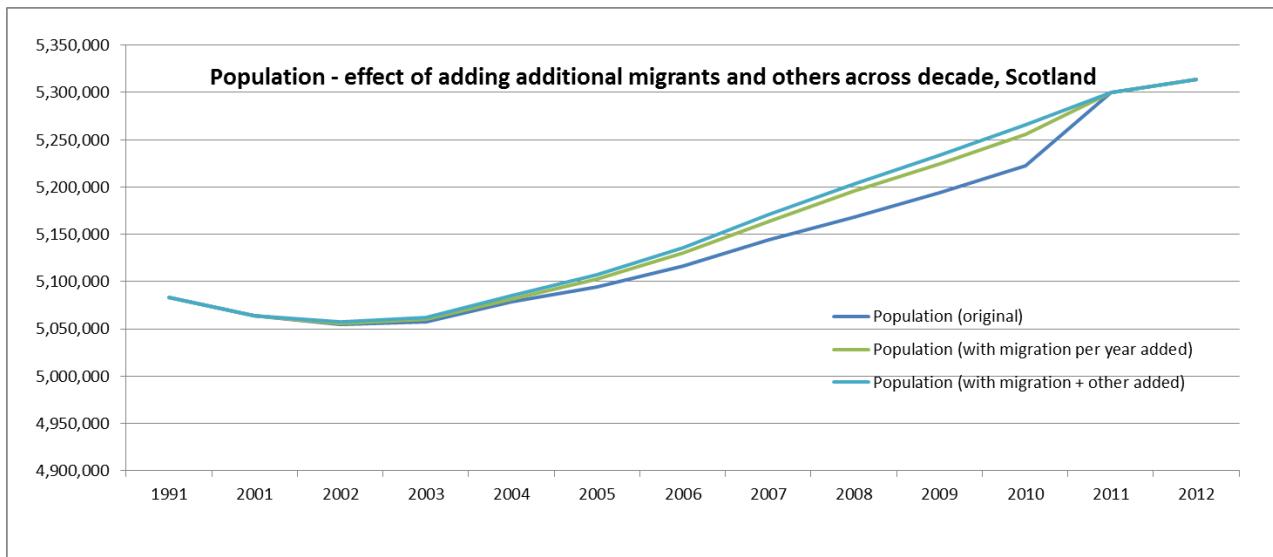
### **Potential impact of changes from revised international migration methodology**

	Attributed to component	Percentage of Discrepancy
<b>Total discrepancy</b>	<b>49,400</b>	
<b>Components</b>		
Switch to Long Term International Migration estimates of international migration	300	0.6
Migrant Switchers roll-back	3,300	6.7
Visitor Switchers roll-back	-900	-1.8
Republic of Ireland roll-back	1,700	3.4
<b>Change in International Migration methodology total</b>	<b>4,400</b>	<b>8.9</b>

8. The published table, above, also includes the impact of switching to using LTIM from the IPS flows and the unmeasured migration adjustment used earlier in the decade. We will already have addressed the 300 difference due to using this source through the rerunning of the migration processing discussed above. ONS have provided details of the years the other changes would have affected and some estimate of the share which should be attributed to each year. Migrant and visitor switcher roll-backs affected the years mid-2001 to end-2003 so cover two and a half years. An approximation places equal amounts in the first two years and half as many in the remaining half as below:

	<i>Attributed to component</i>	<i>mid-2002</i>	<i>mid-2003</i>	<i>mid-2004</i>	<i>Total</i>
Migrant Switchers roll-back		3,300	1,300	1,300	650 <b>3,250</b>
Visitor Switchers roll-back		-900	-350	-350	-175 <b>-875</b>
<b>Impact</b>		<b>2,400</b>	<b>950</b>	<b>950</b>	<b>475</b> <b>2,375</b>

9. The Republic of Ireland roll-back affected six years from mid-2001 to mid-2007. Applying 285 additional people to each year gives a total of 1,710.
10. No specific difference was attributed to undercount in the IPS itself in the reconciliation paper, although it was acknowledged that the confidence intervals around the estimates allowed for an undercount potentially as large as 40,000. The evidence from change in stocks of residents by country of birth, supported by the far higher inflows suggested by Worker Registration Scheme (WRS) and National Insurance Number (NINO) registration, suggests that too few EU8 migrants were picked up by the IPS, as has been assumed in England & Wales. This will affect the years in which the undercount may have occurred – i.e. from 2004 onwards. From 2004 to 2011 we implicitly used the central estimate of net inward migration from European Union (EU)U8 countries of 29,000 people. This is at least 34,000 lower than the change in stocks suggested by the IPS (an increase of 53,000 to 80,000 people). In England and Wales they distributed the assumed undercount of EU8 migrants across years in line with the number of migrants that had been estimated by the IPS in those years, and assigned a smaller number to 2009-10 and 2010-11, which was within the confidence interval for the IPS estimate.
11. For Scotland the confidence intervals around the number of EU8 migrants each year can provide a guideline for the distribution of the additional migrants. We have been provided with the estimates of in- out- and net migration by citizenship with confidence intervals. One approach for Scotland is to assume that each year since 2004 the true level of net migration from EU8 countries is around the upper bound of the 95% confidence interval for that year, and well within the confidence interval in the latest two years since improvements to the IPS coverage and weightings. The remaining 11,000 additional people to be added across the ten years to reach 49,400 can be added equally, 1,300 to each year until mid-2010, with the remaining number attributed to the three-quarters year to census day. Adding additional migrants to each year at Scotland level as suggested and then distributing the additional people as above gives the following result on population and average household size. This process should be repeated / refined using the recalculated migration figures from part A as the base population.



### Council and NHS Board area population estimates (part C)

12. We have started thinking about how we will rebase the council and NHS Board area population estimates but still have some work to do. We plan to use the new population estimates gained from using the new migration estimates and adjustments and compare with the 2011 population estimates for each area. The remaining unattributable difference by area, sex and age will then be distributed, probably equally, although we will consider a cohort approach, across the decade by single year of age and sex.

13. We may refine the method depending on the results we get at each stage.

#### Note:

PAMS members are invited to comment on the proposed rebasing methodology. We would like to invite a couple of Local Authority (LA) volunteers to help quality assure the rebased estimates representing all LAs rather than just their LAs, similar to the Census Quality Assurance process. Due to time and resource constraints views would be needed at short-notice in November and timescales would be very tight.