ECONOMIC AND SOCIAL RESEARCH COUNCIL
END OF AWARD REPORT

For awards ending on or after 1 November 2009

This End of Award Report should be completed and submitted using the **grant reference** as the email subject, to **reportsofficer@esrc.ac.uk** on or before the due date.

The final instalment of the grant will not be paid until an End of Award Report is completed in full and accepted by ESRC.

Grant holders whose End of Award Report is overdue or incomplete will not be eligible for further ESRC funding until the Report is accepted. ESRC reserves the right to recover a sum of the expenditure incurred on the grant if the End of Award Report is overdue. (Please see Section 5 of the ESRC Research Funding Guide for details.)

Please refer to the Guidance notes when completing this End of Award Report.

Grant Reference	**RES-163-25-0049**		
Grant Title	**Demographic characteristics and projections of ethnic minority and religious groups**		
Grant Start Date	**07/01/2008**	**Total Amount Expended:**	**£ 89,194.02**
Grant End Date	**30/06/2010**		
Grant holding Institution	**University of Oxford**		
Grant Holder	**Dr Sylvie Dubuc**		
Grant Holder's Contact Details	**Address**	**Email**	
	32 Wellington Square OX1 2ER Oxford	Sylvie.dubuc@socres.ox.ac.uk	
		Telephone	
		01865 270349	
Co-Investigators (as per project application):		**Institution**	
Pr David Coleman		**University of Oxford**	

1. NON-TECHNICAL SUMMARY

Please provide below a project summary written in non-technical language. The summary may be used by ESRC to publicise your work and should explain the aims and findings of the project. *[Max 250 words]*

Post WWII migration to the UK has shaped the multiethnic and religious composition of the UK population today. Measuring the demographic characteristics of minority groups, their differences and trends is essential for informing projections of the whole population and its future composition, and is of interest to society and policy. This

includes societal concerns like teenage pregnancies and social cohesion, and is of practical value for government planning and policy (e.g. family planning, schools, immigration, ageing population and workforce forecasts).

This project studied the ethnic and religious demographic diversity in the UK quantitatively and was further used to project the future population of the UK. Combining various available data sources and refined methodology the main findings of this project included: The fertility between ethnic groups in the UK is converging, largely due to the lower fertility of the children of immigrants from high fertility countries (e.g. Pakistan, Bangladesh) whose proportion within their respective ethnic group is increasing. The increasing number of second and higher generations' minority groups allowed first fertility comparisons with their immigrant peers. Results support some partial ethno-socio-economic stratification. New population projections by ethnic groups under several scenarios reflect the striking increase of the ethnically mixed group in the UK, projected to become the largest ethnic minority group by 2071, ahead of the non-British White. Additionally, our data suggest – in contrast to reports in the US and hitherto scarce evidence in Europe- that the Non-religious group has just surpassed the Christian group in fertility over the recent years.

2. PROJECT OVERVIEW

a) Objectives

Please state the aims and objectives of your project as outlined in your proposal to the ESRC. *[Max 200 words]*

As copied from original proposal:
(1) to use existing statistical sources (especially the 2001 Census, the LFS and the ONS LS) to update to 2006, and to expand and if necessary correct, time-series of the demographic characteristics of the ethnic minority populations of Britain prepared under an earlier study and
(2) to use the results to analyse the convergence (or otherwise) of the demographic characteristics of ethnic and religious groups, including mixed unions, as an indicator of integration and of the possible future diminution of the distinctiveness of minorities
(3) thereby to improve population projections to mid-century and beyond of the main ethnic minority populations. This work will build upon the earlier analysis of ethnic data up to the year 2001 and the projections based on that year.
(4) to employ the new question on religious affiliation asked in the 2001 census to derive preliminary estimates of fertility rates and other demographic information for the major religious groupings, with a view to making preliminary projections of the future size of those religious communities.

Overall, the results will serve to evaluate the future population size, age-structure and ethnic and religious composition of the national population, on various assumptions.

b) Project Changes

Please describe any changes made to the original aims and objectives, and confirm that these were agreed with the ESRC. Please also detail any changes to the grant holder's institutional affiliation, project staffing or funding. *[Max 200 words]*

None. The above objectives were fully met, as indicated below. Additionally, improved methodology was established as described in methodology.

c) Methodology

Please describe the methodology that you employed in the project. Please also note any ethical issues that arose during the course of the work, the effects of this and any action taken. *[Max. 500 words]*

Building on previous expertise, methodology has been refined and adapted for the purpose of this project. These include novel ASFR and TFR calculations by ethnic groups using the detailed 2001 census ethnic definition and, for the first time, fertility estimates by religious groups and distinguishing between immigrant and UK-born generations of women.

Fertility estimates and method development

The LFS data together with the Own Children Method (LFS-OCM) were used to produce fertility estimates from 1987 to 2006 as described in Dubuc, 2009 and Dubuc and Haskey, 2010 (objective1). The method uses survey information to link children to their mother and reverse survived children and women up to 14 years prior to the survey. The LFS-OCM was refined to minimise mismatching and to account for mortality to correct for slight underestimations otherwise. A detailed description and assessment of the applied LFS-OCM has been published (Dubuc, 2009a). Although work intensive the method permits from a single survey to produce births counts for 15 years and pooling data from several surveys drastically increases sample size allowing estimates by ethnic sub-groups to be performed with good confidence, as has been shown in Dubuc and Haskey, 2010, Dubuc, 2010. Combined with earlier estimates, the results provided long term trends from the late 1960s to 2006 for the main ethnic categories (Coleman and Dubuc, 2010). Further, ONS-Longitudinal Study ASFRs by ethnic and religious groups were produced (1991-2006) and compared to LFS-OCM estimates (objective 1). It is likely that the refined methodology will serve as benchmark for future LFS-OCM approaches.

Improving mortality estimates for population subgroups

No data on mortality by ethnic and religious sub-populations are currently available. Producing mortality data were explored: data on immigrants in England and Wales were used to derive life tables by ethnic groups and showed modest mortality differentials. Additionally, ONS-Longitudinal Study Age-Specific-Mortality rates are produced here in view of making life tables by main ethnic and religious groups for future projection models.

Migration estimates

Migration data was produced to project populations by ethnic groups. The census and labour force survey data on recent migrants, ONS migration data

according to birthplace and other sources were used to produce estimates of net migration by ethnic groups up to 2006 (objective1). Net immigration flows from different countries of birth derived from adjusted data were based on the International Passenger Survey (IPS) and translated into ethnic flows using the detailed cross tabulations of birthplace and ethnic origin from the census and the LFS (Coleman, forthcoming).

Population projections

A cohort-component projection method was used, with a separate Excel workbook for each of the 12 ethnic groups and combined to give the aggregate UK totals. The 2001 census ethnic categories, some ethnic groups were combined where necessary. Totals were only constrained to the UK overall total for 2006, not subsequently. A 'standard' projection was based on similar assumptions on long-term overall total fertility, and net migration to those of the ONS Principal Projection. Variant projections adopted different assumptions, described in Appendix 1.

d) Project Findings

Please summarise the findings of the project, referring where appropriate to outputs recorded on *ESRC Society Today*. Any future research plans should also be identified. *[Max 500 words]*

Long time-series fertility estimates from late 1960s to 2006 have evidenced the general decreasing fertility of the main ethnic groups in the UK, including immigrants from high fertility sending countries (Coleman and Dubuc, 2010). An overall convergence in the TFR trends of the various ethnic groups (based on the detailed 2001 census ethnic categorisation) over the period 1987-2006 was measured (Dubuc and Haskey, 2010). However, departures from the general trend were also identified and contrasting age patterns at childbearing remain (Dubuc and Haskey, 2010). Novel fertility estimates (TFRs and ASFRs) distinguishing between UK-born and foreign-born women of the various ethnic groups have provided important new data to develop informed fertility assumptions for future projection models (Dubuc, 2010b) (objectives 2 and 3).

These results highlight the respective contribution of immigrants and native-born women in shaping the fertility of minorities and provided novel evidence that the overall convergence of ethnic groups in the UK is largely driven by the fertility behaviour of the children of immigrants, whose fertility level and timing at childbearing tends to resemble that of the majority group (White British), compared with their contemporary immigrant peers (Dubuc, 2010a,b). Results were used to test the pertinence of the linear and segmented assimilation theory applied to fertility (Dubuc in process) (objective 2).

Updated international migration data and results of the population projections by main ethnic groups and under various migration assumptions are summarised in Appendix 1 and Coleman (forthcoming). For instance, the mixed ethnic populations are progressing most rapidly and are expected to become the main ethnic minority group shortly by 2071 or even earlier in the case of a 'balanced migration' scenario, overtaking the current larger minority ethnic group, the 'White Other'. The refinement of LFS-OCM methodology (above) proved especially efficient in

estimating fertility of mixed ethnic unions (Dubuc, 2009a). Additionally the method has been recognised (Dubuc 2010a,b) to minimise the increasingly documented problem (e.g. Toulemon, 2004; Sobotka and Lutz, 2009) of over-estimation of immigrants' fertility by more commonly used calculations of period TFRs (Dubuc, 2010a,b; Dubuc, in process) (objective3).

Fertility estimates by religious affiliation were produced for the first time in the UK. Level of fertility and age pattern at childbearing measured over 1988 to 2006 were found to vary across groups. Religious women groups' TFR in descending order were: Muslim women, Jewish women, Christian and women with no religion, Sikh, Hindu, Other and Buddhist women. The increasing numerical and relative importance of Strictly Orthodox Jews is likely to contribute to the increase in TFRs of the Jew group in recent years. The TFR of women with no religion has become slightly higher than the Christian group in the recent years (Dubuc, 2009b). The results further evidence a much lower fertility of UK-born Muslim women compared to immigrant Muslim, especially remarkable for women below 30. This suggests among Muslim women, a greater involvement of UK-born generation(s) of women in education and paid work). These findings will inform fertility assumptions for future projection of religious sub-populations (Dubuc, 2009b,c) (objective4).

e) Contributions to wider ESRC initiatives (eg Research Programmes or Networks)

If your project was part of a wider ESRC initiative, please describe your contributions to the initiative's objectives and activities and note any effect on your project resulting from participation. *[Max. 200 words]*

This project was part of the Understanding Population Trends and Processes (UPTAP) program. In line with the aim of the programme, this research involved detailed secondary data analysis (Census 2001 data, LFS and IPS) and building capacity of a (foreign-origin) social geographer (PI) in demographic methods and UK datasets. This was facilitated by attending workshops and short courses on data sources and analysis, statistical and demographic methods (e.g. excel using macros and VBA, generalised linear modelling, projection methods and longitudinal analysis).
Further dissemination is ongoing, results have already been communicated to academic audiences (nationally and internationally) and to users (e.g. APS-LFS user meeting; Greater London Authority: UPTAP/BURISA workshop, City Hall). Additionally attendance to media training will help the PI communicating findings to the wider public in due course.
Finally, the project contributed to the understanding of demographic trends and processes which affect society and the population and especially 1) the influence of ethnic and religious factors and of the socialisation's environment (societal and family levels) in shaping fertility behaviour, 2) their impact, together with migration, on the size and composition of the population and 3) under-researched aspects of the processes of integration of population of foreign descent (second-third generations).

3. EARLY AND ANTICIPATED IMPACTS

a) Summary of Impacts to date

Please summarise any impacts of the project to date, referring where appropriate to associated outputs recorded on *ESRC Society Today*. This should include both scientific impacts (relevant to the academic community) and economic and societal impacts (relevant to broader society). The impact can be relevant to any organisation, community or individual. *[Max. 400 words]*

Published international peer-reviewed papers:

Coleman D. and S. Dubuc (2010) 'The fertility of ethnic minority populations in the United Kingdom, 1971 – 2006' *Population Studies*. Vol 64, No 1.

Coleman D., (forthcoming) 'Projections of the Ethnic Minority populations of the United Kingdom, 2006- 2056' in *Population and development Review. In press.*

Dubuc S. (2009a) 'Application of the own-children method for estimating fertility by ethnic and religious groups in the UK', Journal of Population Research, Vol 26, No 3.

Book chapter:

Dubuc S. and J. Haskey (2010, in press) 'Fertility and Ethnicity in the UK: recent trends' in Population trends and Processes, Volume 3: Ethnicity and Integration (J. Stilwell and M. van Ham eds.) Chap 4.

Papers at international conferences and workshops:

Dubuc S. (2010a) 'Les différences de fécondité en fonction de l'appartenance ethnique et religieuse des femmes en Grande-Bretagne', Seminar paper at the National Institute of Demographic Studies (INED), Paris, 17th of June.

Dubuc S. (2010b), 'Fertility variation across ethnic and religious groups and the second generation in the UK' in *Multi-state demographic estimates and projections of culture, religiosity and migrants in Europe* International Workshop by the International Institute for Applied Systems Analysis and the Vienna Institute of Demography. 1-2nd March, Vienna.

Dubuc S. (2009b) 'Fertility and religion in the UK: trends and outlook' Paper at the *Annual Meeting of the Population Association of America*, 29th April - 2d May 2009.
(http://paa2009.princeton.edu/download.aspx?submissionId=90987)

Dubuc S. (2009c) 'Religion and fertility in the UK', BSPS conference, 9-11th of Sept, Brighton.

Dubuc S. (2009d) 'Fertility by ethnic and religious groups in the UK, trends in a multi-cultural context'. Paper presented at the *IUSSP International Population Conference*, Marrakech, 2 of October. 2009.(http://iussp2009.princeton.edu/download.aspx?submissionId=93139)

Dubuc S. (2009e) 'Fertility, ethnicity and religion: recent trends in the UK', UPTAP workshop, Leeds, 23-25 of March 2009.

Dubuc S. (2009f) Demographic Manifestations of son-preference in England and Wales' Paper at the *Annual Meeting of the Population Association of America*, 29th April - 2d May 2009. (with fertility results by immigrant groups)
(http://paa2009.princeton.edu/abstractViewer.aspx?submissionId=90979)

Dubuc S. (2008a) 'Estimating inter-censuses fertility rates by ethnic and religious groups using the LFS and the Own-Child Method' Paper at APS-LFS user meeting, 2d Dec 2008

(www.ccsr.ac.uk/esds/events/2008-12-02/dubuc.ppt)

Dubuc S. (2008b) 'Estimating fertility by ethnic groups' at UPTAP/BURISA workshop at City Hall, Greater London Authority, London on the 26 September 2008

Dubuc S. (2008c) 'Recent trend in fertility by ethnic and religious groups' BSPS annual conference.

Coleman D. and S. Dubuc (2008). 'Ethnic change in the populations of the developed world.' Paper at the European Population Conference, Barcelona, July 2008.

b) Anticipated/Potential Future Impacts

Please outline any anticipated or potential impacts (scientific or economic and societal) that you believe your project might have in future. *[Max. 200 words]*

Papers in preparation for submission in 2010:
Dubuc S. 'The convergence of fertility between ethnic groups: the role of the native-born generations in the UK' (provisional title)

Dubuc S. 'Religion and fertility in the UK' (Provisional title)

One paper comparing demographic estimates from several sources and methods in early stage of being drafted

Results to be presented at:
Research Method Festival (Oxford) 2^{d} of July 2010.
Dubuc S. 'Estimating fertility by ethnic group and other subpopulations'(confirmed)

EAPS (Vienna) Sept 2010:
Dubuc S. 'The convergence of fertility between ethnic groups in the UK: the role of the immigrant and UK-born generations' (confirmed)

BSPS (Exeter) Sept 2010:
Dubuc S. 'How immigrant and UK-born generations have shaped the fertility of ethnic groups in the UK'(confirmed)

Other conferences anticipated:
PAA (Washington) April 2011
APS-LFS user meeting 2010

Other invitations to present findings:
Seminar at the Centre for Population Change, in Southampton (confirmed, July 2010).

Future research plan:
To follow up on this project, a new research on fertility of immigrants' children in the UK and in relation to education will be undertaken by the PI (1 year John Fell OUP award starting October 2010).

You will be asked to complete an ESRC Impact Report 12 months after the end date of your award. The Impact Report will ask for details of any impacts that have arisen since the completion of the End of Award Report.

4. DECLARATIONS

Please ensure that sections A, B and C below are completed and signed by the appropriate individuals. The End of Award Report will not be accepted unless all sections are signed.

Please note hard copies are NOT required; electronic signatures are accepted and should be used.

A: To be completed by Grant Holder

Please read the following statements. Tick ONE statement under ii) and iii), then sign with an electronic signature at the end of the section.

i) The Project

This Report is an accurate overview of the project, its findings and impacts. All co-investigators named in the proposal to ESRC or appointed subsequently have seen and approved the Report.	x

ii) Submissions to *ESRC Society Today*

Output and impact information has been submitted to *ESRC Society Today*. Details of any future outputs and impacts will be submitted as soon as they become available.	**x**
OR	
This grant has not yet produced any outputs or impacts. Details of any future outputs and impacts will be submitted to *ESRC Society Today* as soon as they become available.	☐
OR	
This grant is not listed on *ESRC Society Today*.	☐

iii) Submission of Datasets

Datasets arising from this grant have been offered for deposit with the Economic and Social Data Service.	**x**
OR	
Datasets that were anticipated in the grant proposal have not been produced and the Economic and Social Data Service has been notified.	☐
OR	
No datasets were proposed or produced from this grant.	☐