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Foresight Futures:

Demographic Change in the UK

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This report, commissioned by the Government Office for Science, was never published. The Foresight team took an unusually active role in editing the successive drafts submitted. The author did not agree with all these alterations and this draft was submitted to Foresight Futures according to deadline with some reluctance *faut de mieux*. It was not in a suitable format for publication otherwise but now that a website is available I have taken the opportunity of presenting it here. Although much has changed in the last nine years I hope that enough of the material remains valid and that it may be useful to the reader, always keeping in mind that it is a snapshot of the UK as in 2013.

Since then three major developments have changed the demographic scene. First was the Covid 19 pandemic, a threat long warned against but impossible to forecast. From April 2020 to May 2022 there were 177,977 deaths from covid in the UK within 28 days of a positive test; 67,350 deaths in 2021 where covid was the underlying cause (11.5% of all deaths) and 73,766 in 2020 (12.1 %). In England the pandemic is not yet over; while there were no deaths on 12 December 2022 the 7 day average was 57. By comparison the four cholera epidemics of 1831 - 1866 which caused such panic, led to 108,969 deaths.

Partly as a consequence of the economic shutdowns during Covid, and the uncertainties following Brexit in 2016, total fertility in England and Wales fell from 1.81 in 2016 to 1.70 in 2018 and 1.58 in 2020 (the lowest recorded), recovering slightly to 1.61 in 2021. ONS projections assume that low fertility will persist, reducing projected UK population growth compared with previous projections.

Migration patterns were powerfully affected by Brexit, which ended free movement from the EU. Net migration from the EU accordingly fell substantially, becoming negligible and in some years negative. The desire to reduce migration inflows was the single most important factor behind the Brexit vote but supporters of Leave have not achieved their aim. Employers, alarmed by shortages of labour on which they had become dependent have been quick to switch recruitment to non-European countries; previous levels have persisted; net migration in 2021 was 230,000. Despite previous promises, here is no inclination on the part of the present government to reduce migration; 'control' does not mean 'reduce'. Recent political reverses, however, have provoked a flurry of restrictive measures.

The 2021 census confirmed the trend evident from 2001 to 2011 of the advance of ethnic minority populations to become the overall majority in major urban centres: London, Birmingham, Leicester and others. In some London Boroughs the ‘White British’ population had fallen to 15 percent of the total.

ONS Deaths registered in England and Wales:2021.

<https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsregistrationsummarytables/2021#main-points>

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Executive Summary

Demographic change is a key driver of change that affects a wide range of Government policy. Understanding more fully how demographic trends may change in the future will help decision makers in Government to understand the implications for policy.

Key messages

Demographic trends are intimately associated with social, economic and intellectual trends in society, both as consequences of those trends and drivers of them. These include changing attitudes to marriage, families, childbearing, women's careers and economic independence, higher education and prosperity, decline in religious belief and acceptance of ethnic, sexual and other minorities.. Consequent demographic trends for example in the postponement of reproduction and longer life, affect labour supply, housing demand, pensions and so on. Effective management of migration, for example, cannot be achieved simply by immigration control.

Demographic awareness

It is imperative for policy-makers to become more demographically aware, assessing in timely fashion the effect of population change on society and economy, and the likely impact of policies on population and its characteristics. Most effects of government policy on population –for example welfare changes, or immigration rules, are unintended but despite that can be substantial. This is especially true as populations become more geographically and occupationally mobile. Policy measures should be accompanied by a demographic impact statement.

The need for better and more timely demographic information

In order to manage a complex welfare state, education, health and the rest, timely and accurate demographic information becomes more necessary. The UK has joined most other advanced societies in dropping the decennial census. But the necessary improvement of demographic information will not be in place until a full system of population registration has been.

Health and wellbeing – Government and other organisations will need to find ways to avert trends such as the increase in dementia and Alzheimer's, and to treat those who suffer from such diseases. Obesity is a major threat to increasing life expectancy further, but needs co-ordinated action in many areas including education, publicity, food labelling, and potentially food pricing.

Education and employment – Poor educational standards play a pervasive role in many of the problems revealed by demographic data – lone parenthood, ill health, the cycle of poverty. It appears to be strongly connected with the persistent social and hence demographic inequality that characterises the UK. Further reform of UK education, and encouraging employers to train their own workforce is already a recognised goal, although inevitably slow to achieve.

Energy demand and consumption – The Government's policies on energy need to take into account fully the implications of projected demographic change, which will likely increase the demand and consumption of energy, and make the measures which are taken to reduce output more costly and more difficult to achieve.

Public spending – Future demographic trends suggest that the growing and ageing population will place additional demands on public spending, including pension costs. The Government could do

more to plan for long-term financial provision, including reassessing the viability of making long-term promises on pensions which may not be achievable

Main findings

Mixed notices for UK demography

The UK demographic scene presents rather a mixed picture. UK population size underwrites a potentially strong position in the EU and, through GDP, a place in the G8. Closer inspection reveals that in a number of demographic matters affecting welfare, the UK has fallen behind many of its comparable European partners. A relatively poor position in the international rank-order does not matter in itself, but it indicates how much the welfare of the people could be improved in a number of areas.

Fertility

For example, the overall birth rate is one of the highest in Europe, protecting the population from the severe population ageing that threatens other countries. It implies that women are having almost as many children as they say they want. But not all these children are wanted. About 30% of all pregnancies are unplanned. About one-fifth of all conceptions end in legal abortion. Family planning services are not always easily reached by those who need them most. Teenage birth rates, although declining, are the highest in Western Europe, bringing disadvantage to mother and to child. Nearly 30% of children are living in poverty, considerably higher than in many of our Western partners

Mortality and morbidity

Although expectation of life continues to increase, mortality rates overall continue to be higher than average by Western European standards. Female mortality trends are not so favourable: smoking among young women remains a recalcitrant problem. UK levels of obesity are the highest in Western Europe and second only to the United States, threatening a future burden of illness and premature death. A picture emerges of a population entering older age in ill health, markedly so among the poorer section of the population. Only about 60% of extra years of life are disability – free and the trend is deteriorating.

Population Ageing

UK ageing –related problems now and in the future arise not from avoidable demographic causes but from economic weakness and pensions problems. With only 30% of current workers covered by contributory pension schemes and a low state pension, serious pensioner poverty threatens unless recent schemes succeed. The movement of pension entitlement ages constantly upwards is farsighted and welcome, and necessary as life expectancy increases

Family and living arrangements.

The UK is in the forefront of European trends towards new family forms – marriage has become unpopular, giving way to cohabitation, with high levels of lone parenthood. Separation, divorce. and re-partnering create diverse parenting sequences for children which are associated with child poverty, especially where the child is brought up without two co-resident partners, of which the UK has the highest proportion in Western Europe.

Population growth

The UK faces a marked upward trend in population growth following the rise in immigration since the late 1990s and increases in the birth-rate. This growth rate is the highest since the 1920s and on recent projections would take UK population to nearly 80 million by mid-century. This growth already puts pressure on maternity services, schools and housing, will require large infrastructure investment.

Migration

Large inflows since the late 1990s are, directly and indirectly, the predominant driver of the population increase noted above, and to projected future population increase. Argument persists about its overall economic effects. It is a major bone of political contention. The post-2004 migration from Eastern Europe was widely welcomed by many, especially, employers and consumers of services. In the longer run, given the low-wage and low-skill occupations of most of the A8 immigrants, it may not have been beneficial to UK economic development.

Diversity

As identified in the recent Foresight report on Future Identities (2013), all aspects of British society are becoming more plural, including ethnic and religious diversity. Through immigration and natural increase, minority groups have greatly increased, to reach 8 million or 14% of the UK population in the 2011 census. Rapid minority growth and the departure of the 'White British' population has turned London, Leicester, Luton and Slough into 'majority-minority' cities. Some groups are highly successful socially and economically, fitting seamlessly into the broader life of the UK. Others remain relatively unsuccessful, segregated and poorly integrated. People of mixed origin already number 1.2 million. Continued immigration at recent levels implies continued ethnic change in other cities and in the UK as a whole. The future is very uncertain. In the long run, inter-ethnic union and other progress in integration should make ethnic distinctions increasingly unimportant and ethnic categories redundant. Research in the rather different societies of the US, however, raises the possibility of large-scale segregation and persistence of disadvantage.

Current Evidence

The UK presently has a population of 63.3 million people (ONS 2012a), the third largest in Western Europe and comparable in size to France and Italy. The UK's population averages 270 people per square km, the third highest in Western Europe after the Netherlands (403) and Belgium (364). The population density of England by itself is 395 persons per square kilometre. Although its GDP per capita is only a modest \$35,000 (PPP), 11th in the EU, its population size underwrites a total GDP sufficient to keep the UK in the G8.

Demographic change relies on three key factors:

- Number of births
- Number of deaths
- Migration to and from the country

Birth-rate

Fertility and births in the UK have risen in the last decade (Figure 1) although remain still much lower than the post-war and 1960s peaks. In 2010 the UK's Total Fertility Rate (TFR)¹ rose to 1.98, and live births to 807,300, both the highest since 1973. In part this was forecast, as the continued postponement of births was not compatible with the family size preferences repeatedly stated in surveys. (Bongaarts and Sobotka 2012). However the scale of the 2000s 'baby boom' has caught everyone by surprise. Fertility rates in the UK are now among the highest in Europe, compared to an

¹ Total Fertility is the conventional annual measure of the birth rate, calculated as the average number of children per woman implied by current birth rates of women of all ages in a given year. Technically, it is not a 'rate'.

EU27 average of 1.6 The increase in the numbers of births also follows an increase in the number of mothers arising from recent immigration. 25.5% of births in England and Wales were to immigrant mothers in 2011, compared with 12% in 1990, and over 31.9% of births had at least one immigrant parent. ONS projections based on 2010 still assume a long-term TFR of 1.84, and annual live births up to 2035 of between 800,000 and 840,000. ONS projections based on 2012 are not yet available. Most researchers believe that the higher fertility rates among some minority ethnic groups are likely to fall as social and economic norms change, to nearer those seen among the majority ethnic group (in that case fertility rates overall might decline slightly in future). Birth-rates are higher among some minority ethnic groups such as Pakistani and Bangladeshi women but these have declined from TFRs of about 4 and 6 respectively in the 1980s to about 3 in 2005, according to 'own-child' calculations (Dubuc 2012).

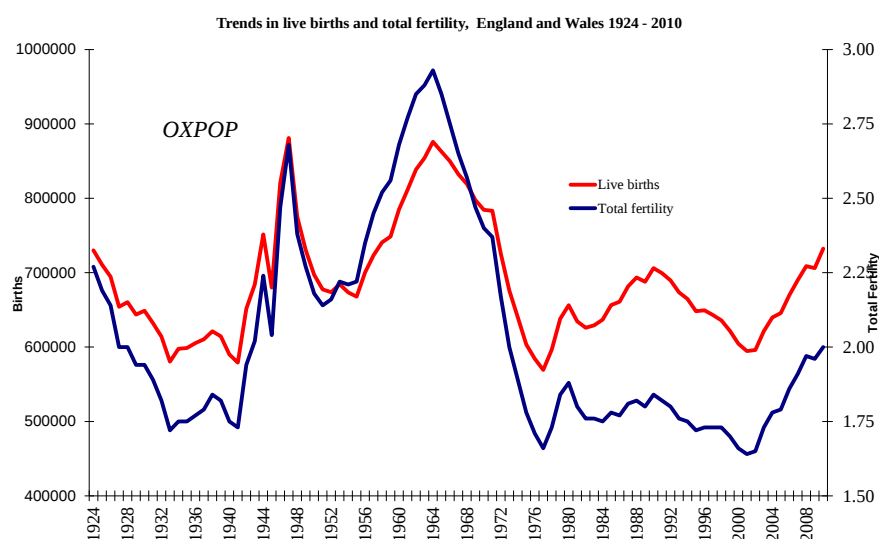


Figure 1: Live births and TFR, England and Wales. Source: ONS. Note Annual data on TFR are not available for the UK before 1961.

Deaths

Life expectancy has been increasing in the UK in uneven fashion since the 18th century and consistently since the 1970s, and is projected to continue to do so in future (Figure 2) thanks to advances in healthcare and improvements in lifestyle (ONS 2013a). Recent and projected increases in expectation of life and are almost entirely due to better survival in older age (Figure 3) Currently, 95% of male and 97% of female new-born babies can expect to survive to at least the age of 50, while infant mortality is down to 4.2 infant deaths per thousand live births in 2010 (England and Wales). Mortality is always higher among men than among women, but in recent years this gap has narrowed as men's life expectancy has risen more than women's. This is partly due to the trend for more men to give up smoking, so male death rates from lung cancer and other smoking-related diseases have continued to decline, although not as steeply as previously. In contrast, deaths from lung cancer and chronic respiratory disease among females aged 35 – 69 have risen in the last few years, reversing the previous downward trend that began in 1988. Two-thirds of the deaths of female smokers aged 50-80 are caused by smoking (Pirie et al 2013). In 1980 life expectancy at birth was 70.8 years for males and 76.8 years for females. This has increased by, on average 2 months per year, so for those born in 2010 life expectancy has risen to 78.1 for males and 82.1 for females.

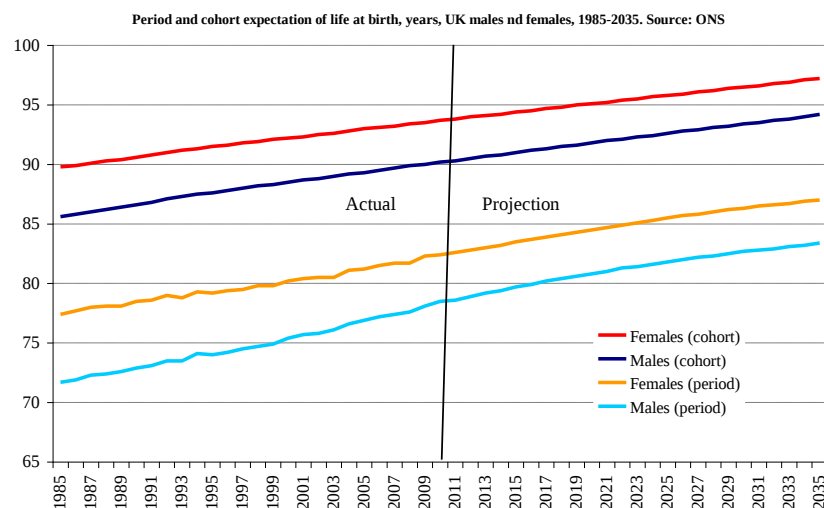
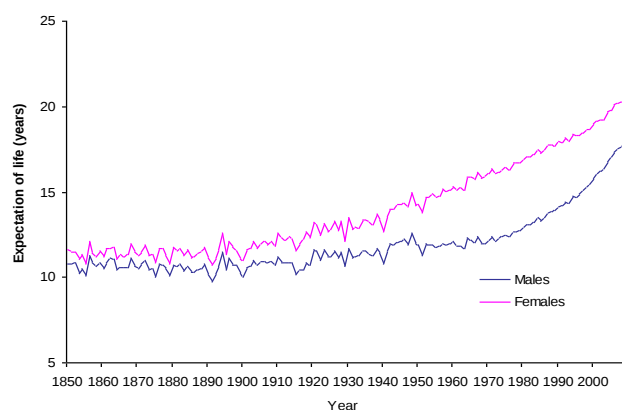


Figure 2: Period and cohort expectation of life at birth, UK, males and females 1985 – 2035. Source: ONS.

Causes of death in the UK (and other Western countries) are dominated by: circulatory diseases such as ischaemic heart disease², stroke, and pulmonary thrombosis; various forms of cancer; and respiratory diseases including pneumonia and bronchitis. In almost **all** these diseases, treatment and survival rates have improved, in some cases dramatically. Circulatory diseases are no longer the main causes of death (29% of deaths in 2011 in England and Wales), while cancers have shown a more gradual decline (30% of deaths in 2011 (ONS 2013a). Age-standardised death rates from lung cancer declined from 842 per million population in 1991 to 457 in 2011, and from 300 to 298 for women. Death rates from Ischaemic heart disease fell from 2984 per million in 1991 to 992 in 2011 among men, and from 1407 to 434 among women. Breast cancer death rates, very high until the 1990s, have since declined sharply, bringing the UK closer to a more average European position (Autier et al. 2010). Deaths from dementia and Alzheimer's disease have risen substantially. . In 2012, 800,000 people were estimated to suffer from dementia (mostly Alzheimer's), costing overall £23 billion. According to the Alzheimer's Society (2012), numbers of sufferers are projected to rise to one million by 2021 and to 1.7 million by 2051 at today's age-specific prevalence rates.



² Ischaemic heart disease is the most common cause of death in developed countries. The basic pathology is a constriction of blood supply to the arteries of the heart, usually arising from atherosclerosis. It can be chronic, manifesting as angina, or acute, manifesting as a heart attack (myocardial infarction) which is the most frequent cause of sudden death.

Figure 3. Expectation of life at age 65, men and women England and Wales 1850 - 2010

However, compared to most other developed countries outside Eastern Europe, the UK's life expectancy is below average (Figure 3). Compared with the rest of the EU 15 and the US, Australia, Canada and Norway (EU15+), UK life expectancy in 2010 ranked 14th out of 19). The UK's life expectancy has not increased as rapidly as some other countries. From 2001 – 2009, EU 27 average life expectancy has risen from 80.9 to 82.6 for women, and from 74.6 to 76.7 for men (UK premature mortality (deaths before the age of 75) compares particularly badly (Murray et al 2013),. In 2008 the UK, together with Ireland, had the highest rates of obesity in Western Europe (WHO <http://apps.who.int/gho/data/view.main.2430>). Obesity is linked with higher risks of disability and death from diabetes, heart disease, stroke, kidney and liver disease, and the risks of limb amputation (Prospective Studies Collaboration 2009) and costs the NHS £5.1 billion per year. A major Foresight study (Brown et al. 2010) predicted that the prevalence of obesity would rise by 2020 to 41% among males aged 20-65 and 39% among women, and 44% among men and 38% among women aged 40-65.

Although life expectancy overall has increased, healthy (i.e. free from any disability) lifespan has not risen in proportion. In 1995, women could expect to spend 68% of their 18.2 years of life expectancy free of disability. This fell to 55% by 2009. Among men, the decline was more marked, from 79% in 1995 to 61% in 2009. Dementia, and arthritis and other bone and muscle diseases, were the chief causes. As noted earlier, the number of people living with severe disabilities will increase considerably in future. It is possible that improvements in life expectation might be halted because of the rise of obesity and other problems, but this is not a majority view and forms no part of the ONS projections

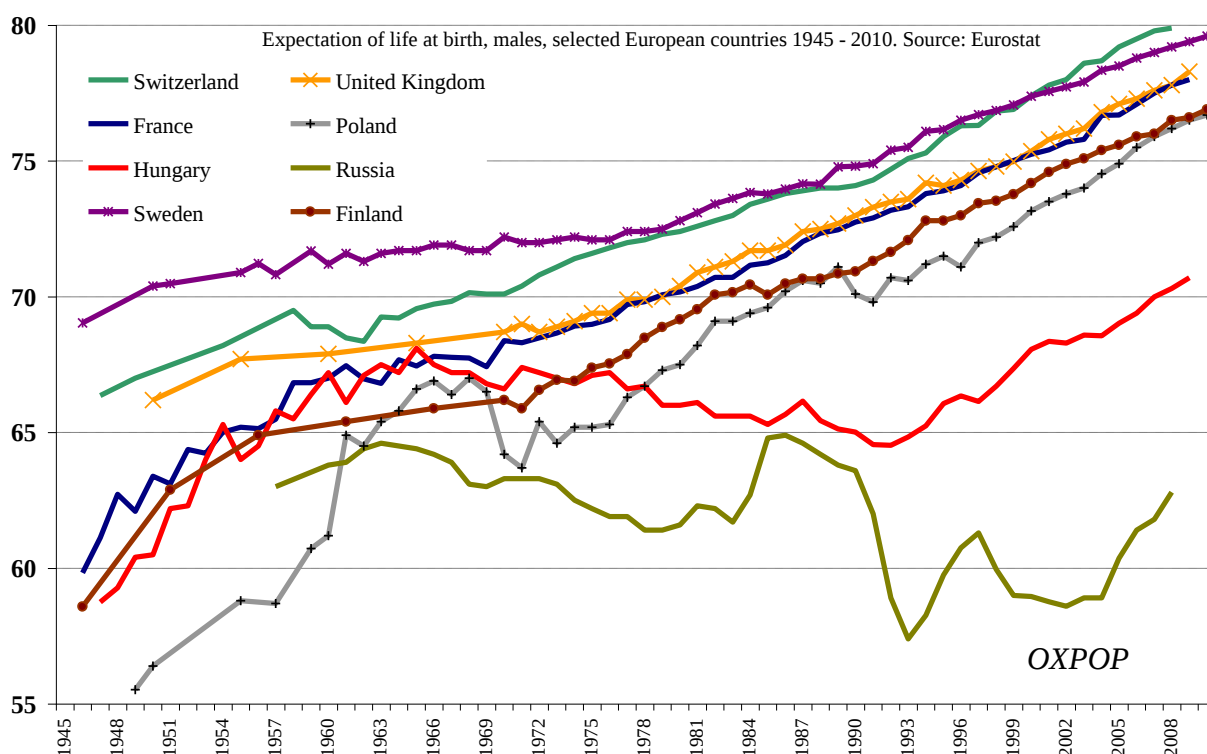


Figure 4: Life expectation at birth, males, selected European countries 1945 – 2010. Source; Eurostat, national statistical yearbooks.

Migration

Net migration into the UK has been the major contributory factor to the overall increase in the UK's population observed over the past decade³. Of the 7.8 million immigrants in England and Wales in 2011, 3.8 million - just over one half – had arrived most recently in the UK in the decade 2001 – 2011 (ONS 2013b). Net inflows to the UK increased rapidly after the policy change after 1997 (Mitchell and Pain 2011) to take net immigration to historic peaks of 245,000 in 2004 and 252,000 in 2010 (data from ONS 2013c and earlier). The Labour Government of the late 1990s introduced policies designed to encourage immigration, as an asset with economic, demographic and social benefits. The UK was the only major UK economy to permit unrestricted entry for work to citizens of the new member states of the EU in Eastern Europe from May 2004. Over a million have since entered the UK, creating a Polish population of 513,000 by 2011. In 2008 a new 'points based system' was introduced in response to employer demands, which devolves primary decision-making to sponsors such as employers and colleges, replaces interviews with documentation, and places no limit on acceptances.

³ It should be noted that the UK's statistics on immigration are not exact. Net migration figures are taken from the relatively small voluntary sample of the International Passenger Survey, supplemented by information on asylum and over-stayers. Standard errors are correspondingly high. The Home Office's Control of Immigration Statistics define migration according to categories defined by the Immigration Rules and only match Identity and Passport Service estimates in a few categories. The Home Office figures do not include movement to and from the EU, which is not controlled and provide no data on outflows. Net movement of labour cannot adequately be counted through UK migration data, partly because it is not known how many of those who enter the UK as students leave to work elsewhere. Without proper checks on exits, and without a registration system, it is impossible to keep track of immigrants or those who overstay their visas or who remain after being refused asylum.

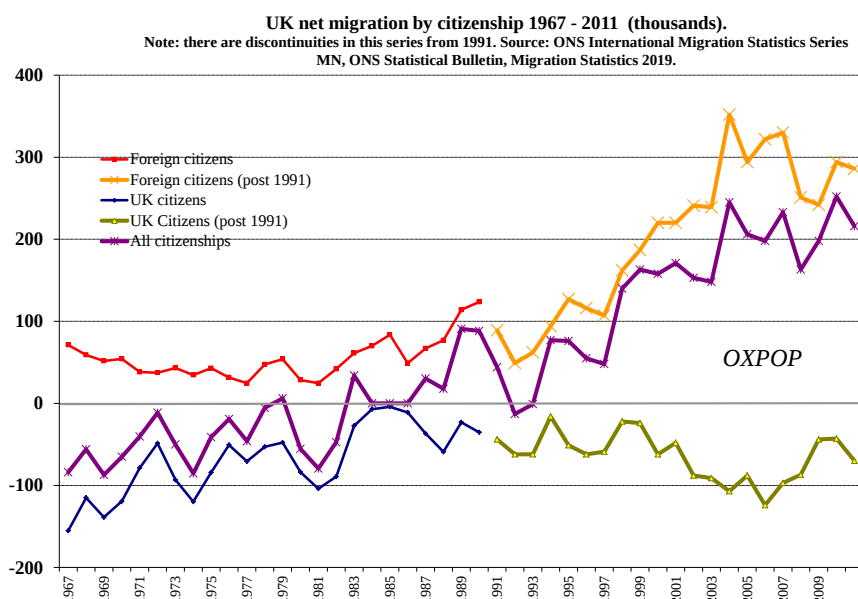


Figure 5. Net migration by citizenship, UK 1967 – 2011. Source: ONS. Note: data for calendar 2012 were not available at the time of going to press

Figure 6 below shows that since the late 1990s, the main net foreign inflows have been from outside the EU (88.4% in 2002, dropping to 68.5% in 2011), mostly from the New Commonwealth and 'Other Foreign' countries - that is, from China and non-Commonwealth countries in Asia, Africa and elsewhere. These have always been the major sources of net inflow. The new A8 Accession Countries since 2004 have only equalled the 'other foreign' inflow in the year 2007. The main categories of immigrants are students and workers, while family migration is also a large component.

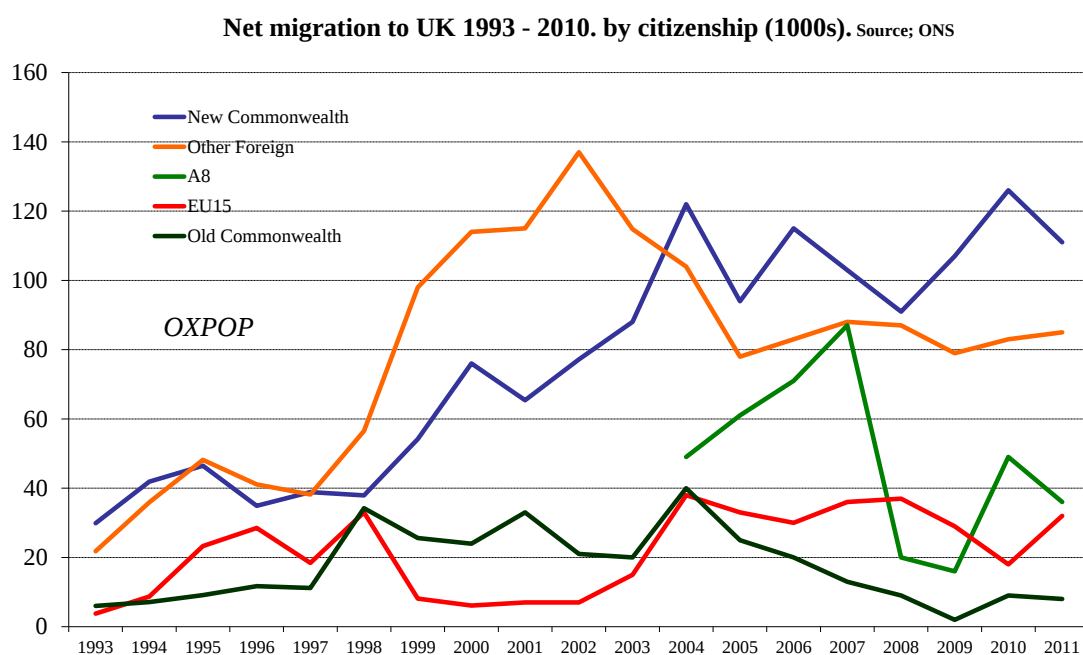


Figure 6: Net migration to UK, 1993 – 2010, by citizenship group. Source: ONS.

The twelve months to June 2012, however, recorded a net inflow of 163,000 people, significantly lower than that of the previous 12 months, due to the Coalition Government's policies. Since December 2010 these policies have included a cap on labour migration, removal of the 'post-study' work route for graduates, Tier 3 unskilled labour and various other categories, and tightening the language and other requirements for spouses and others. Obviously, migration policies as well as global migration patterns will continue to play a decisive role in how migration trends develop in the future and how much of a contribution immigration will continue to make to the UK's demographic profile. Emigration away from the UK has varied over time although since the 1990s considerably smaller than immigration. Since 1967, net movement of UK citizens has invariably been outward, that of foreign citizens inward (Figure). In the future, trends such as changes in policy, climate change, economic circumstances, cost of living and quality of life will continue to drive migration patterns globally

Key trends for the UK population

A growing population

The future trends for these three key drivers of demography will determine the size and shape of the future UK population. The latest 2010-based projections from the ONS (2011a) suggest that the population will increase by 16 million people by 2050, and 25 million by 2086, an increase of 26% on the 2011 population total of 63.2 million. This Principal Projection assumes a long-term TFR of 1.84, net immigration of 180,000 annually and a gradually falling death rate. The ONS also provides variant projections with different assumptions for all three variables

A more numerous population could put increasing pressures on the UK's resources, including increasing pressures on housing, transport congestion, increasing demand for infrastructure, energy, and putting increased stress on natural resources and the environment. This growth already puts pressure on maternity services (Royal College of Midwives 2012), schools (National Audit Office 2013), contributes to current and projected housing demand (DCLG 2010) and will require large infrastructure investment. Environmental consequences will be wholly negative (Hamblen and Canney 2013).

An ageing population

Population ageing is, initially, entirely driven by the decline in the birth rate. However as birth rates stabilise that factor will become less important and population ageing will slow down. Longer life will eventually become the dominant motor of population ageing, as common sense would (incorrectly) suggest was the case from the beginning. Baby booms and other fluctuations alter the pace, not the direction, of change. Figure 7 compares the evolution of two ageing indicators from 1960 to 2010 (Eurostat 2008, 2011).

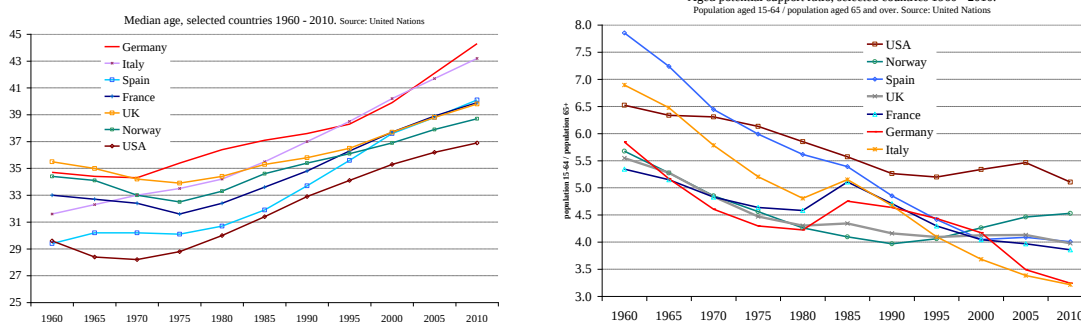


Figure 7 Median Age, and Aged Potential Support Ratio⁴ selected countries 1960 – 2010. Source: Eurostat.

Median age in the UK was 35.5 in 1960 and rose to 39.8 in 2010, about the same as France and lower than other major EU15 countries. The numbers of persons over age 75 is projected to increase from 4.9 million in 2011 to 8.9 million in 2035, and more important, persons of age 85 and over from 1.4 million to 3.5 million (ONS 2011a). Population ageing puts big question marks against intergenerational equity (Johnson, Conrad et al 1989) and the sustainability of pension systems (Eatwell 2000, Bongaarts 2004), the affordability of social care, the adequacy of labour forces and the maintenance of living standards (Bloom and Canning 2010). The 50 year projections of the 2012 Fiscal Sustainability Report (OBR 2012, p. 3) concludes that the public finances are likely to come under pressure over the longer term from ageing population, accounting for most of the increase of public spending from 35.6% of GDP 2016/7, to 40.8% of GDP by 2061/2.

The main areas where the increasingly large numbers of older people will affect public spending are in pension costs, healthcare and social care. Between 2016/7 and 2061/2, state pension costs are expected to rise from 5.6% of GDP to 8.3%, healthcare spending is expected to rise from 6.8% of GDP to 8.3%, and social care from 1.1% to 2%. Reforms to public sector pensions already announced, however, are expected to reduce that cost from 1.7% to 0.7% of GDP (OBR 2012). In 2013, thanks to its relatively high birth rate and with some help from immigration, the UK population age-structure is emerging in a relatively favourable position compared with some of our neighbours in the developed world.

Pensions

Until the end of the 1990s, the UK was relatively well-placed in the western world to cope with financial provision for the retired population, with a viable pensions mix. At its peak, 50% of people contributed to funded occupational pensions. At present, only 38% of men and 34% of women contribute to occupational pensions (). The costs of the basic state pay-as-you- pension were contained by being linked to prices, not incomes. However the British basic state pension is among the lowest in the developed world, so the retired depended heavily on occupational pensions, other savings or National Assistance/Pension Credit. While many current pensioners may be relatively financially secure, those now entering pensionable age recently are not.

⁴ The aged potential support ratio (APSR) is the number of people of nominal working age (here 15-64) for every person of nominal retirement age (65 and over) . Other demographic limits may be imagined (20-59 and 60+, for example), but the comparative picture remains the same. It is ONLY a demographic benchmark intended to show the underlying situation set by population limitations. It takes no account of actual retirement age or workforce participation rates or their change over time, variables determined by public policy and law.

The recent problems of the UK pensions system have not been caused primarily by demographic change (Turner 2005). Life expectancies for the over-65s have been under-estimated by the actuarial profession (Riley 2001) creating a gap between contributions and liabilities in funded pensions. Pension provision has become overly complex, with over 61,000 pension schemes in 2009 some of which have excessive management charges, or are unsuited to job mobility. These require expensive regulation and generate £3 billion of orphan accounts. Stakeholder pensions (2001) or National Employment Savings Trusts (NEST, 2012) add further layers of complexity (Whiteside 2012). This has been compounded by weakness in the stock market (in which much UK pension value is invested), the effects of the dot-com bubble in 2000, the banking crisis from 2008 and the Euro crisis, resulting in a squeeze on interest rates which made annuities and pensions less attractive. Defined-benefit schemes have increasingly been phased out and replaced by defined-contribution schemes, placing more risk on the employee in return for a smaller pension. Some have even questioned whether the long-term contractual promises entailed in pension provision are sustainable (Offer 2009, Clark and Monk 2008).

Healthcare

The proportion of old-age spent in good health and free of disability is profoundly important for individual welfare and for the extension of working life made necessary by longer survival. In terms of Healthy Life Years, the UK compares reasonably well with the EU15 according to the EHLEIS study (Joint Action 2012) but a recent Lancet study (Murray et al 2013) comes to less encouraging conclusions. Both studies conclude that the situation within the UK is deteriorating. In 1995, women could expect to spend 12.3 years of their 18.2 years of life expectancy free of disability (68%). This had fallen to 55% by 2009. Among men, the decline was more marked, from 79% in 1995 to 61% in 2009. Dementia and other behavioural disorders, and arthritis and other bone and muscle diseases, were the chief causes. Deaths from dementia and Alzheimer's disease have increased from less than 1 death per 100,000 population in 1985 to 12 per 100,000 for men and 17 for women in 2010 (ONS 2011b). Although in part a function of changes in diagnosis and the classification of disease (Griffiths and Rooney 2006), that is an extremely worrying indicator for the future. In 2012, 800,000 people in the UK were estimated to suffer from dementia (mostly Alzheimer's), costing the NHS overall £23 billion. According to the Alzheimer's Society (2012), numbers of sufferers are projected to rise to one million by 2021 and to 1.7 million by 2051 (

Implications for public spending on healthcare is one of the most important consequences of population ageing, as 60 - 80% of post-65 healthcare spending is concentrated in the last year of life (REF). However, the health costs of old age have increased more through inflation of medical costs than through demographic change. Up to 2006, admittedly during a period of modest population ageing, only 0.2 points of the 3.4% increase in NHS expenditure could be attributed to population ageing (Hawksworth 2006). A high proportion -variously estimated as between 60 and 80% - of medical costs over age 65 arise in the last year of life. Social care of the elderly is a bigger concern, although a major Swiss study found no or weak age effects on health care expenditure for the health care expenditure when proximity to death is controlled for, (Werblow et al. 2007).

UK estimates suggest, under the current pattern of services, that average total lifetime costs at age 65 of social services, public and private, residential and community-based are about £18,650 for men and £41,350 for women (Comas-Herrera and Wittenberg 2010). In 2012, 390,000 people in the UK were estimated to in residential care institutions of every kind. That is projected to increase to 730,000 by 2041, and total costs for all kinds of public and private old age social care from £17.8 billion in 2012 to £55.6 billion in 2041: that is from 1.5% to 2.6% of annual GDP (Wittenberg et al. 2010).

Increasing diversity

The UK has become increasingly more ethnically diverse since the 1960s. The 1991 census was the first to record self-ascribed ethnic origin. The non-white population then stood at 3 million or 6% of

the total in England and Wales. By 2011 this had increased to nearly 8 million, or 14% of the total. An increasing proportion of the white population are themselves not of British ethnic origin. Those describing themselves as 'White British' comprised 88% of the total in 2001 and 81% in 2011. In the UK as a whole, that proportion will be somewhat higher, as most of the ethnic minority population is resident in England.

Basic data on ethnic composition, England and Wales 1991 - 2011

	1991	2001	2011
Total population (millions)	49.890	52.042	56.076
White (millions)	46.876	47.521	48.209
White British (millions)	n/a	45.534	45.135
Non-White (millions)	3.014	4.521	7.867
Percent White	94.0	91.3	86.0
Percent White British	n/a	87.5	80.5
Percent Non-White	6.0	8.7	14.0

Source: Census 1991, 2001, 2011.

Table 1. Basic data on ethnic composition, England and Wales 1991 - 2011

Comparing 2001 and 2011, all groups except the Irish increased their population size and share of the total population. The Black African population doubled in size, while the 'Other White' group increased the most in absolute numbers. Following the accession to the EU of Eastern European countries in 2004. The increases in numbers of 'residual' categories such as 'Other Asian' and 'Other Black' are more difficult to understand and may reflect changes of identity and categorisation. The White British population declined slightly; all the intercensal increase of 4 million arose from ethnic minority growth, from immigration and from natural increase.

Ethnic minority populations, numbers and percent, England and Wales 2001 and 2011

	2001		2011		intercensal
	millions	percent total population	millions	percent total population	growth percent
Other white	1.35	2.6	2.49	4.4	85
Indian	1.04	2	1.41	2.5	36
Mixed	0.66	1.3	1.22	2.2	85
Pakistani	0.72	1.4	1.13	2.0	57
Black African	0.48	0.9	0.99	1.8	106
Other Asian	0.24	0.5	0.84	1.5	247
Black Caribbean	0.56	1.1	0.59	1.1	5
Irish	0.64	1.2	0.53	0.9	-17
Bangladeshi	0.28	0.5	0.45	0.8	60
Chinese	0.23	0.4	0.39	0.7	73
Other	0.22	0.4	0.33	0.6	51
Other Black	0.10	0.2	0.28	0.5	192
Arab			0.23	0.4	

Source 2001, 2011 census.

Table 2. Ethnic minority populations, numbers and percent. England and Wales 2001 and 2011

The 2011 Census showed that, for the first time, the 'White British' population of London accounted for less than half of its total population (44%). Compared with 2001, the 'White British' population

had fallen by nearly 620,000 or 14%, while the non-white population rose by 1.2 million or nearly 60%. The White population as a whole, which includes many persons of East European and other non-British backgrounds, fell slightly as a share of London's total but the numbers of people identifying themselves in this way increased from 800,000 to about 1.2 million.

Summary table ethnic change in London 1991 - 2011

	1991	2001	2011
Population totals and percent			
Total population (millions)	6.680	7.172	8.174
Non-white (millions)	1.391	2.069	3.287
Percent of total	20.8	28.8	40.2
White (millions)	5.289	5.103	4.887
Percent of total	79.2	71.2	59.8
White British (millions)	n/a	4.288	3.669
Percent of total		59.8	44.9
Intercensal change			
	1991-2001	2001-2011	
Total population change (millions)	0.492	1.002	
Percent change	7.4	14	
Non-white population change (millions)	0.677	1.218	
Percent change	48.7	58.9	
White population change (millions)	-0.186	-0.216	
Percent change	-3.5	-4.2	
White British population change (millions)	n/a	-0.619	
Percent change	n/a	-14.4	

† Sources: Census 1991, 2001, 2011

Table 3 Summary table ethnic change London 1991 - 2011

The increasing diversity of the UK's population has been both due to immigration into the UK, and a higher birth rate among immigrant and minority ethnic mothers. UK population increased by 3.5 million between the censuses of 2001 and 2011.. Net migration contributed almost 2 million (1,967,000, 56% of that intercensal increase. Births to immigrant mothers added a further 504,547, raising the contribution to the intercensal population increase from immigration to 85.5.

The proportion of births to immigrant mothers has risen by 55% since 2001. In 2011 births to immigrant mothers exceeds that of native-born mothers by 2:1 (1,040,135 compared to 504,547). Table X shows the number of births in 2011 by the birthplace of mother (ONS 2013a). Births to women born in Poland increased tenfold over the decade to become the most numerous category.

Live births by country of births of mother, England and Wales, 2011

Top ten countries.

Country of birth of mother	Number	Percent of all live births
Poland	20,495	2.8
Pakistan	18,434	2.5
India	14,892	2.1
Bangladesh	8,371	1.2
Nigeria	7,476	1.0
Somalia	5,654	0.8
Germany	5,108	0.7
South Africa	4,430	0.6
Lithuania	3,788	0.5
China	3,611	0.5
	184,529	25.5

Source: ONS 2012

Table 4. Live births by country of birth of mother, England and Wales 2011.

In the future, the UK will become more ethnically diverse to an extent primarily dependent on future levels of migration, as a later section shows. and the distribution of minority ethnic groups within the country will change. Presently, almost all minority ethnic groups are concentrated in cities, some in such numbers that areas of some cities are now very different in feel (REF). Ethnic minority populations have begun to disperse more widely across the UK, into smaller towns, villages and the countryside while the numbers in cities continue to grow.

Family/ household composition

Out of the 23.4 million households in England and Wales in 2001, 14.4 million (62%) were one-family households, 7.1 million one-person households (30%) and 1.9 million (8%) of other types. Compared with 2001, single-person households were little changed as a proportion of the total, while there was a marked increase (28%) in the proportion of 'other' households, although the numerical increase was relatively modest. These include multi-generational households, where elderly relatives live with their adult children and their families, households where young adult children have remained living – or moved back after university, and unrelated young adults sharing flats or houses.

Households and families; England and Wales, 2001 and 2011

	2001 Census total	percent of each type, 2001	2011 Census total	percent of each type, 2011	Numerical change 2001- 2011	Per cent change 2001-2011
Households, all types	21,660	100	23,366	100	1,706	7.9
One person households	6,503	30	7,067	30	565	8.7
Family households	13,716	63	14,449	62	733	5.3
Other households	1,442	7	1,850	8	408	28.3
Families in households	14,682	68	15,764	67	1,082	7.4

Source: ONS 2013, table

Table 5 Households and Families, England and Wales 2001 - 2011

The proportion of households which consist of a married or civil partnered couple with children has fallen by 2% since 2001, while a range of other household arrangements have become more frequent. Households comprising cohabiting couples increased by 28%, lone parent households by 21% (ONS 2013d)

Marriage and cohabitation

The popularity of marriage has been falling since the 1970s. Of women born in 1955, 89% had married by age 35. That fell to 75% among women born in 1965, and to 57% among those born in 1975, although it is still the preferred choice of living arrangement in surveys. In the 2011 Census, fewer than half (47%) of the adult household population (23.4 million) were married and 12% cohabiting, compared with 51% and 10% respectively in 2001. Those who do marry are marrying later, with men on average marrying for the first time at the age of 32.1 in 2009, and women at 29.9. However there has been very recently a slight upswing in the number of marriages, while the mean age of first marriage appears to be stabilising (ONS 2012a). It is too soon to tell if this is significant or likely to continue.

Two-thirds of respondents to surveys see little difference between marriage and cohabitation (Beaujouan and Ni Bhrolchain 2011). Cohabitation before marriage is now normal. Of those marrying in 2009, 83% already lived together, including 73% of those marrying in church. Therefore people are often in stable relationships for some time before marriage, so although marriage age has increased, the formation of partnerships may not have changed much from earlier eras.

While it is still true that the majority of families in the UK are a married couple with children, a range of other family types have become more frequent and socially acceptable. Of the 6.2 million families with dependent children in England and Wales in 2011, 58% were married couples. 15% comprised cohabiting partners and 27% were lone parent families (ONS 2013d).

Since the 1950s, the proportion of births outside marriage in England and Wales increased tenfold from a low of 4% to reach 47.2% in 2011. While the majority of these births were to cohabiting couples, 16% were births to lone mothers, without a co-resident partner or any partner at all. Of women aged 20 – 24 who had their first baby in 2011, 30% had no partner or had a partner living elsewhere.

Type of Registration	All ages	Under 20	20-24	25-29	30-34	35-39	40-44	45 and over
2011 Numbers of births								
All (numbers)	723,913	36,435	134,946	200,587	207,151	115,444	27,518	1,832
Within Marriage/Civil Partnership ¹	382,574	1,410	31,785	107,383	143,519	79,951	17,388	1,138
Outside Marriage/Civil Partnership ¹	341,339	35,025	103,161	93,204	63,632	35,493	10,130	694
Joint Registrations same address	226,057	14,600	63,287	66,102	47,706	26,688	7,213	461
Joint Registrations different address	73,464	12,960	26,826	17,379	9,489	5,093	1,603	114
Sole Registrations	41,818	7,465	13,048	9,723	6,437	3,712	1,314	119
Percent in each type of registration, within each age-group								
All (percent)	100	100	100	100	100	100	100	100
Within Marriage/Civil Partnership ¹	53	4	24	54	69	69	63	62
Outside Marriage/Civil Partnership ¹	47	96	76	46	31	31	37	38
Joint Registrations same address	31	40	47	33	23	23	26	25
Joint Registrations different address	10	36	20	9	5	4	6	6
Sole Registrations	6	20	10	5	3	3	5	6

Table 6: Births in England and Wales 2011 by age of mother and relationship.

At present, about 46% of marriages are likely to end in divorce by 25 years' duration, although very recent trends suggest that married couples are less likely to divorce than previously (ONS 2012b). Most marriages that end in divorce do so quickly, half within ten years, with marriages between very young adults, remarriages, marriages between those with existing dependent children, with partners of lower educational attainment, and those taking place in a registry office rather than a church, all statistically more likely to fail (Wilson and Smallwood 2008, Haskey 1999). Attitudes to marriage have changed since the 1970s, as there has been an increasing trend towards secularism (Lesthaeghe 2010, Foresight 2013), and women's equality in education and the workforce has progressed, and with it, greater economic independence. That freedom has been reinforced by successive changes in the law. Two thirds of petitions for divorce are now brought by women.

Cohabiting couples are more likely to split up than married couples, perhaps reflecting at least partly the wish between the more stable couples to marry. One analysis showed that 64% of cohabiting couples were still in the same situation after five years: of those whose situation had altered, 60%

had married their partner and 40% had split up (Kiernan 2004). Various longitudinal and cross-sectional surveys show, in the UK, as elsewhere, the likelihood of cohabitating relationships splitting up are at least double the risks of a marriage breaking up, even after adjusting for the age of the partners, the presence of dependent children and other factors (REF). In the UK Millennium Cohort, 28% of children born to cohabiting couples were no longer living with both those parents by their fifth birthday, compared with 10% of those born to married parents. Cohabitations studied in the British Household Panel Survey had had a very short life-span: 68% survived for one year, 27% for three years and 17% for five years (Ermisch and Francesoni 2000a,b).

Older motherhood

Women have been postponing their first baby since the 1970s, but this trend has levelled off (ONS 2013e). In England and Wales, mean age for women to have their first baby rose from a low point of 23.7 in 1971, to 27.9 in 2011. However, birth rates among women their 20's have stopped falling, while more babies are being born to women in their 30's and early 40's (Bongaarts and Sobotka 2012). In England and Wales, fertility rates are now highest for women in the 30 – 34 age bracket (Figure 8).

**Age-specific fertility rates per thousand women, England and Wales
1999 - 2010. Source: ONS 2012, Characteristics of Mother 2.**

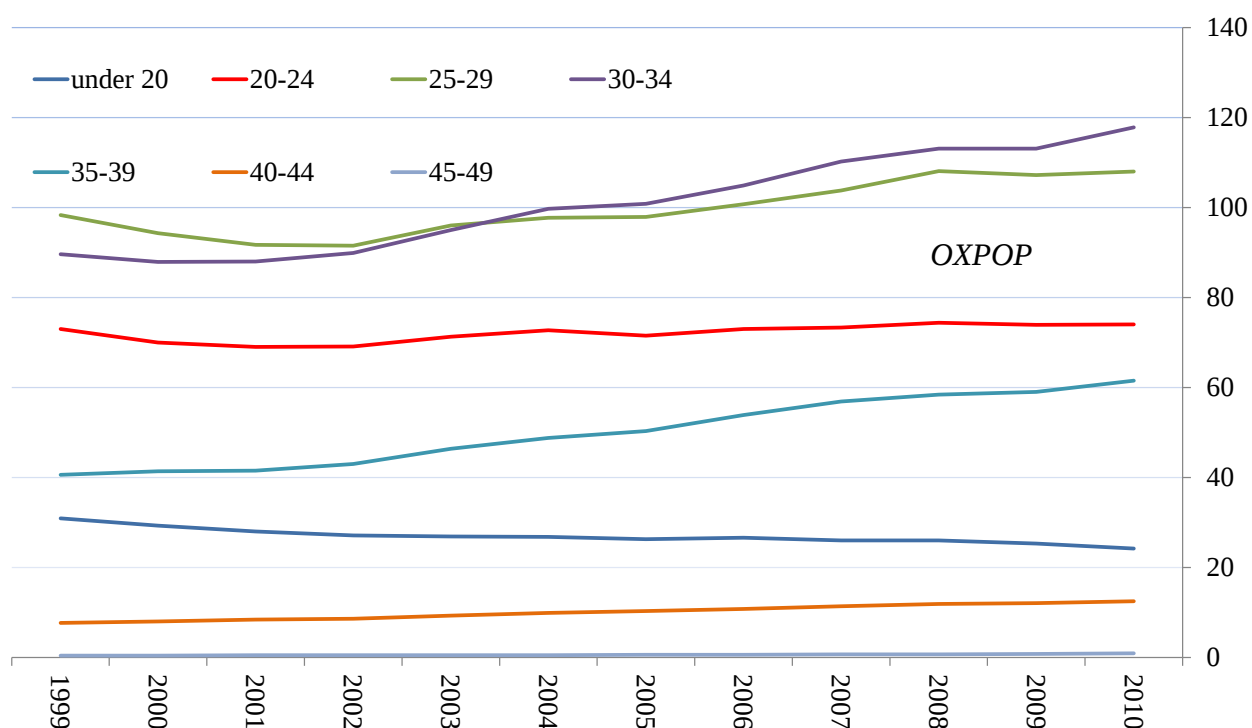


Figure 8: Age-specific fertility rates, women in England and Wales 1999 – 2010. Source: ONS 2012.

Teenage motherhood

Rates of teenage motherhood have been declining in the UK but the UK still has the highest rate of teenage pregnancy in Western Europe. The rate of teenage childbearing in the UK in 2011 was 21.9 births per 1000 women aged 15-19, compared to an EU15 average of 8.7 per 1000 women aged 15 – 19. A 2005 study of teenage pregnancy in Edinburgh (the most recent in the UK) showed that only two-thirds of teenage pregnancies that ended in childbirth were clearly intended, while one in ten was definitely unintended, and around a quarter of women were ambivalent. One in five of the

pregnancies in that study ended in abortion, and of those 90% were unintended pregnancies. Cuts to budgets supporting reproductive health may result in further increases in teenage pregnancy, as proper information and support is vital in preventing unwanted pregnancies (All-Party Parliamentary Group 2012), although from 2013 local authorities have been mandated to commission comprehensive open access to confidential contraception & STD advice.

Teenage motherhood is often associated with a poorer outlook in terms of health and prospects for mother and child (Swann et al. 2003). In 2011, 44% of the 36,435 teenage births were to women in a relationship (whether married or cohabiting), while more than half (56%) had no partner or had a partner living elsewhere. Early motherhood – and being a lone mother – has costs for the state and also for the individual, as future life prospects of higher education, a career, and chances of social mobility are reduced (Kiernan and Mensah 2009).

Welfare

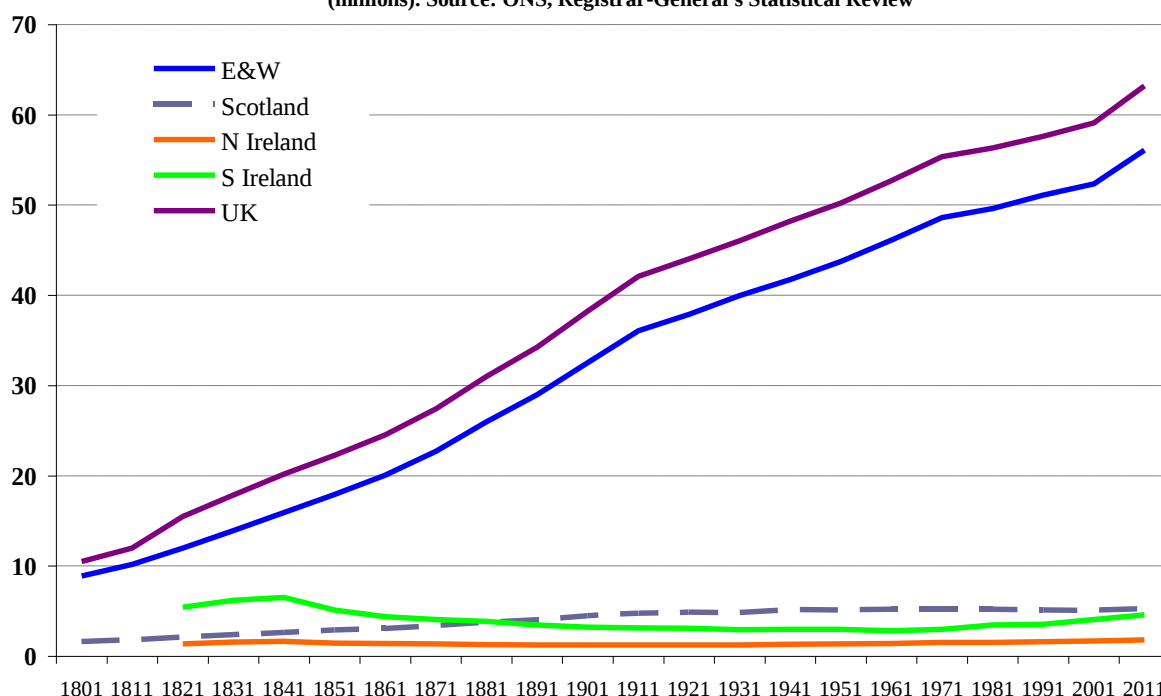
In the UK x% of families receive benefits. Of lone parent families, who are more likely to be poor (de Paz Nieves et al. 2009), X% rely on welfare to support themselves and their children. 90% of single parent families are headed by women, of whom y% receive financial support from their former partners. A recent attempt to estimate tax credits and lone parent benefits to lone-parent families suggested a cost to the UK of £13.3 billion (Relationship Foundation 2012).

Regional variations

While the overall trends set out above hold true for the UK as a whole, there are regional variations which are important to consider in developing policies which could affect different parts of the country differently. Some of these regional variations have lengthy historic reasons. For example, while the populations of the UK as a whole has increased over the past two centuries (Figure 9), this has largely been due to increases in the populations of England and Wales while the populations of Scotland, Northern and Southern Ireland have not shown such dramatic increases. In Scotland, population numbers stalled at about 5 million for the last century, only increasing by 11% since 1911.

Figure 9: Population trends, UK and constituent countries and Southern Ireland, 1801-2011.

Population Trends, UK and constituent countries, 1801-2011
(millions). Source: ONS, Registrar-General's Statistical Review



Over the decade to 2011, the population of Wales grew by 5.3%, a record increase. The population of every English region grew, most notably in London which increased by 11.6% over the decade. The East Midlands and the East of England also experienced a large increase in population (8.3%) followed by the South East and South West (see table). The North East and North West increased the least (4.5%) – both those regions, and the North as a whole, had had a decrease in population over the previous decade.

Population change, 1991-2011 Wales and England Regions

	1991	2001	2011	Change	Percent	Change	Percent	Annual
	population	population	population	1991-2001	intercensal	2001-2011	intercensal	intercensal
	(thousands)	(thousands)	(thousands)	(thousands)	change	(thousands)	change	change
North East	2,587	2,540	2,597	-47	-1.81	57	2.23	0.0022
North West	6,843	6,773	7,052	-70	-1.02	279	4.12	0.0040
Yorks and Humber	4,936	4,977	5,284	41	0.83	307	6.16	0.0060
East Midlands	4,011	4,190	4,533	179	4.45	344	8.20	0.0079
West Midlands	5,230	5,281	5,602	51	0.98	321	6.08	0.0059
East of England	5,121	5,401	5,847	279	5.46	446	8.27	0.0079
London	6,829	7,323	8,174	493	7.22	851	11.63	0.0110
South East	7,629	8,024	8,635	394	5.17	611	7.62	0.0073
South West	4,688	4,944	5,289	255	5.45	345	6.98	0.0068
Wales	2,873	2,910	3,064	37	1.30	153	5.27	0.0051
England	47,875	49,451	53,013	1,576	3.29	3,561	7.20	0.0070
England and Wales	50,748	52,361	56,076	1,613	3.18	3,715	7.09	0.0069
North (NE, NW, YH)	14,366	14,290	14,933	-76	-0.53	642	4.50	0.0044
South (the rest)	33,509	35,161	38,080	1,652	4.93	2,919	8.30	0.0080

Table 7: Population change, 1991 – 2011, regions in England and Wales

The following graph shows the pattern of changing UK population between 2001 and 2011 (Figure 7). As could be expected, local authorities in urban areas, with high fertility rates and also high inflow, showed the highest population growth over this decade. Tower Hamlets, London, recorded the highest growth rate of a 26% increase over this period, with Newham borough, London, second at

24% ONS 2012d). Interestingly, Dungannon Local Government District (Co. Tyrone) in Northern Ireland came third with a growth rate of 21%, primarily due to a post-2001 influx of people from Poland, Lithuania and East Timor (among others) breaking with the previous trend of only modest growth (REF). Some other rural areas and relatively small country towns, including quite remote places, also showed unusual patterns of growth (Figure 2). In Scotland, the Highlands and Aberdeenshire grew fastest. In England, rural East Anglia around Boston and parts of Essex and Suffolk stand out as areas of relatively high population growth, mainly due to the post-2004 influx of immigrants from parts of East Europe (Bauere et al. 2007) who, unlike previous patterns of immigration from other parts of the world, have spread into areas which previously had not been used to high levels of ethnic diversity.

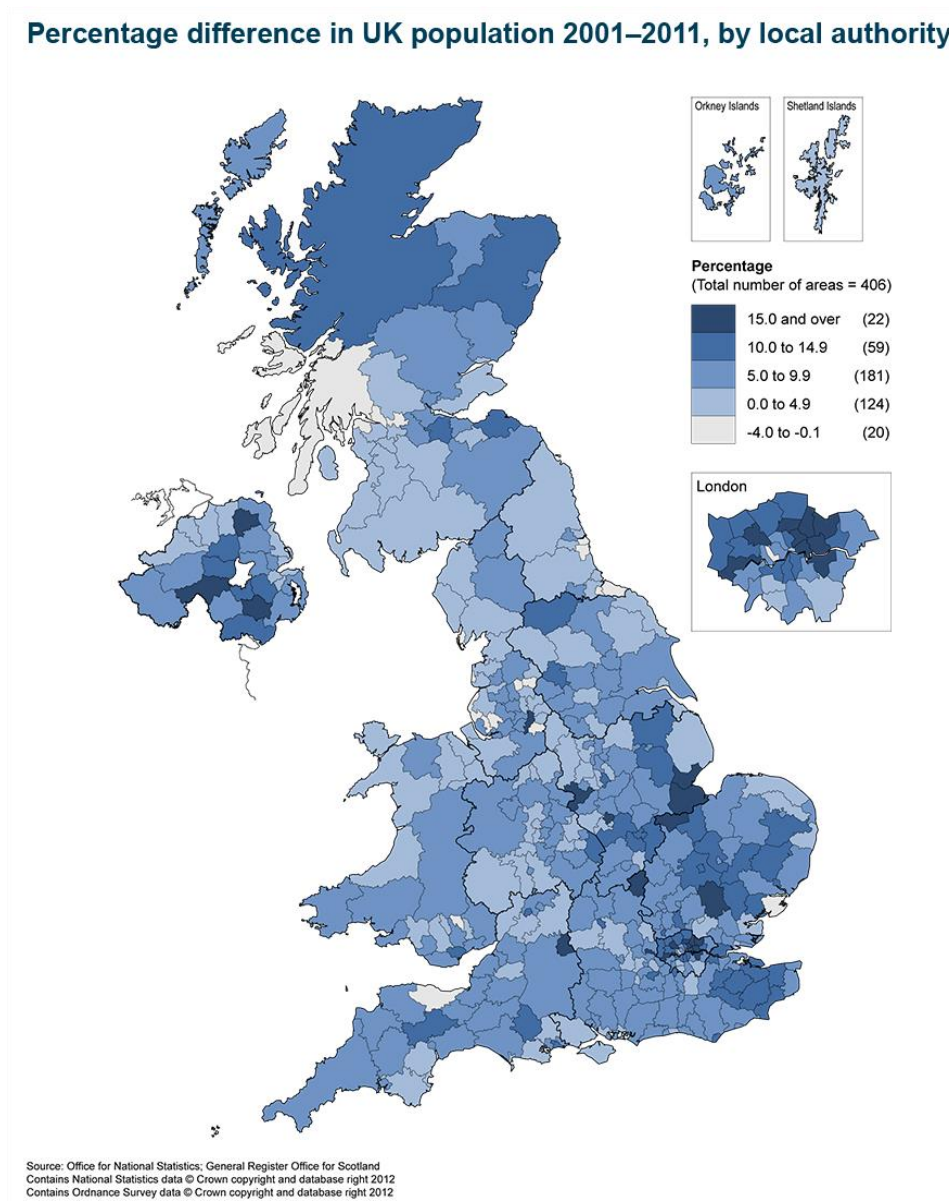


Figure 10: Percentage difference in UK population 2001 – 2011, by local authority area

Main implications for the UK

Labour and education markets

Immigration to the UK has been a highly controversial topic in political and economic debate. The previous government encouraged immigration, the present government is attempting to reduce it. Employers' organisations, the universities, many economists, immigrant pressure groups and business publications strongly favour immigration. The economic and cultural benefits given to the higher levels of the economy and to science and higher education from highly talented migrants are unquestionable. The rapid expansion of universities has made many institutions dependent on the fees of non-EU immigrant students (Stevens 2004). For lower skilled work, immigration keeps down the price of labour, but with unhelpful effects upon poverty and inequality. It may increase the competitiveness of low-productivity work but may reduce incentives for innovation. Much new job creation since 2001 has gone to maintain or expand low-skill, low pay, low productivity sections of the economy, which does not improve overall living standards. Researchers are divided as to whether or not immigration has contributed to unemployment or provided economic benefits (Lucchine et al.2012, Migration Advisory Committee 2012, Coleman and Rowthorn 2004). The House of Lords Committee on the Economic Effects of Immigration (2008), after reviewing a wide variety of evidence, concluded that 'The focus of analysis should be on the effects of immigration on income per head of the resident population. Both theory and the available empirical evidence indicate that these effects are small..... In the long run, the main economic effect of immigration is to enlarge the economy, with relatively small costs and benefits for the incomes of the resident population. The economic impacts of immigration depend critically on the skills of immigrants'.and that the greatest benefits accrue to migrants themselves and to their employers There are also other costs that are difficult to evaluate – such as in crime, health, and security (Coleman 2008). The NHS has become dependent on international migration to supply qualified medical staff, in contrast to most other OECD countries which are more self-sufficient in doctors (Hoesch 2012).

Inequality

Significant inequalities persist between socio-economic groups which is reflected in life expectancy. While all groups improved their life expectancy from the 1980s up to 2006, the gap between higher income individuals and lower income individuals become wider (ONS 2011d). In 2006 women in higher managerial and professional occupations had a life expectation of 83.9 years from birth, compared with 79.7 years for women in routine occupations (Figure 8). After retirement (then 65), higher income women could expect a further 21.7 years of life compared with 18.5 years for lower income women. These disparities are higher among men than women.

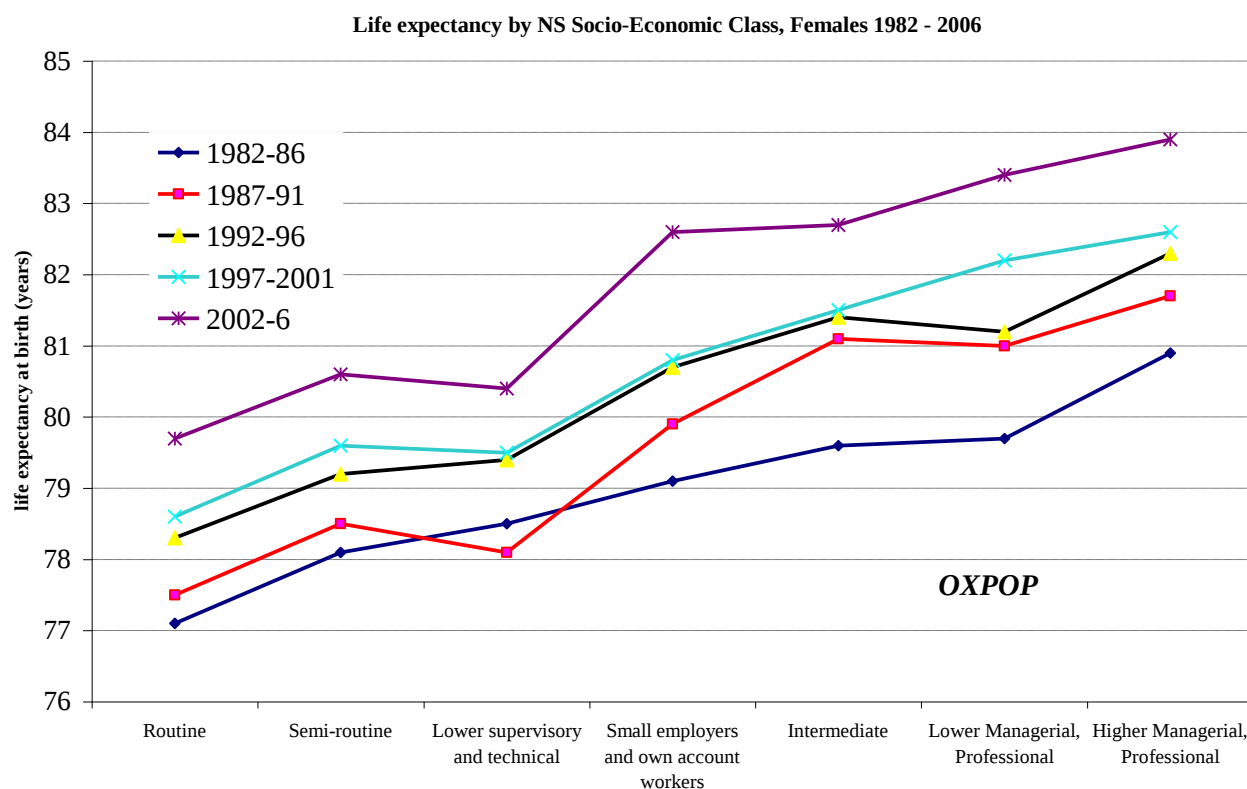


Figure 11. Expectation of life at birth, females in England and Wales, by socio-economic group 1982 – 2006. Source: ONS Longitudinal Study, ONS 2011, Figure 2.

The disparities between socioeconomic groups can also be seen in the expectation of disability-free lifespan, where the most disadvantaged people can expect only 55 years of disability-free life, compared to 68 years for the most advantaged (Marmot 2010). Lifestyle factors play a role, as the incidence of smoking, heavy alcohol consumption and obesity are all more frequent in the lower socio-economic groups, imposing a greater burden of chronic disease.

Child poverty

Child poverty is one of the UK's most specific and serious challenges. In 2010 29.7% of children in the UK aged 0-17 were living in poverty according to Eurostat (2012) compared with an EU27 average of 26.9%. However that average was inflated by very high rates in some Eastern European countries and the UK should best be compared with Sweden (14.5%), The Netherlands (16.9%), Germany (21.7%) and France (23%). That is in line with the findings of the Millennium Cohort Study (n=14579), in which sample 30% of the children in the study were living in poverty at their fifth birthday. This has trebled since 1979 (Holmes and Kiernan 2010).

One of the aspects to consider in addressing child poverty is the tendency for disadvantages to be transmitted across generations – so a child born into a disadvantaged environment is more likely to suffer similar disadvantages throughout life and to pass these on to their children in turn (Kiernan 2003, Berthoud and Robson 2001) which perpetuates and entrenches patterns of poverty associated with other negative patterns. This is the situation in the UK as in other countries studied.

Patterns of child poverty are linked with the break-up of their parent's relationship. Half of marriages that end in divorce involve dependent children, and the circumstances of such break-ups are often stressful. Finding a new partner can restore a degree of material security and lift the household out of poverty, but step-families are more likely to break-up and can worsen the emotional turbulence for a child. Children often suffer further in the transitions from one family type to another and can carry these emotional and behavioural problems with them into adulthood (Andersson 2002, Clarke and Jensen 2004). Children who experienced parental divorce are more likely to have children outside marriage and experience the break-up of their own adult relationships. The children of divorced parents are also statistically more likely to become teenage parents and to go to manifest various forms of anti-social behaviour FIGURES?) (Kiernan 2003). This circularity magnifies child poverty and greatly complicates attempts to alleviate it. It is one of Britain's serious challenges and a major obstacle to the Government's objective, announced in 1999, to halve child poverty by 2020..

Social attitudes and integration

Some evidence presented by Foresight in their recent Future Identities report suggested that social attitudes were moving towards greater tolerance and integration as these attitudes were more common among younger people (Foresight 2013). But there are continuing signs that the UK already faces a major task of integration of some minority groups and promoting social cohesion and trust. With increasing numbers, it may become much easier for parallel communities to become entrenched unless more effective policies can be developed to encourage common citizenship rather than separate development. In the United States, where ethnic change and the diversification of society is further ahead than in the UK, some future scenarios point to unfavourable developments in the large-scale segregation of ethnic groups and the persistence of poverty and deprivation.(Johnson and Lichter (2013) and Lichter (2013).

Energy and food resources

The UK has commitments to reduce carbon emissions and generate 20% of energy from 'renewables' by 2020 (currently 6%), with a target to reduce greenhouse gas emissions by at least 34% by 2020 and by 80% by 2050 below the 1990 baseline. Of the various strategies which have been produced to plan how the UK might achieve this target, few have taken the role of population into account fully, if at all or have dismissed it as unimportant (The Royal Commission's Report 2011, the UK Government's 'Carbon Plan', 2013). Whatever measures are taken to reduce output, the projected growth in the UK's population and increasing numbers of households seem likely to make these targets more difficult to achieve and the cost of attaining them higher. However, the simulations of the UK Infrastructure Transition Research Consortium (Hall et al., 2012) which are the only ones which take the ONS projections fully into account, expect a favourable outcome as long as appropriate and timely investment in infrastructure is made. Under current circumstances, that seems to be problematic.

The existence of a potential world 'food crisis' has been acknowledged (e.g. Lang 2010, Lang et al. 2011), but while global population growth is a component, the main issues are non-demographic: distortions of market and supply, the Westernisation of world diet as a more affluent world eats more meat, the diversion of grain to biofuels, reductions in productivity, the impact of climate change (Barling 2010). With UK population growing so fast, and world population scheduled to increase by a further three billion, some have asked whether the UK can continue to feed itself (Roussou 2010). The conventional, and not unreasonable, answer is that it does not do so already, and has not since the 1830s (Lang 2010). The UK's competitive advantage lies elsewhere. At present the UK imports about 40% of its food requirements, a food trade deficit of about £13 billion. The UK share has declined recently thanks to supermarket sourcing, more exotic tastes, cheaper transport, fewer trade restrictions, and declining domestic output. Imports includes 90% of fresh fruit, all tea and coffee, vegetables, and **hard bread**-wheat. In 2005 the top eight sources were European, including France

(12%), Netherlands (12%) and the Irish Republic (10%) (DEFRA 2006). The DEFRA report noted correctly that the UK was well placed to secure its food compared with most countries and warned against self-sufficiency as a goal. But there are issues about the balance of payments, 'the workings of the international market-place and trade in food and feed products' which 'marginalizes the real challenges facing food supply in the near future (Barling et al. 2008). Projected UK population growth, assuming no reduction in individual consumption, must make the UK economy and its inhabitants that more vulnerable to global food price rises and shortages.

6

Future Trends out to 2061

If current trends continue:

Present projections of the UK population by the Office for National Statistics suggest that the UK population will increase to 78.4 million in 2051, an additional 15 million people or 25% (Figure 9). The upper and lower variants of the projection assume net annual immigration of 60,000 above or below the central assumption. Migration is the most uncertain of the components of change and the only one realistically under government influence. The graph also shows a 'natural change' projection without any migration in or out; increasing through momentum by about three million before beginning a slow decline to return to current population size by about 2056.

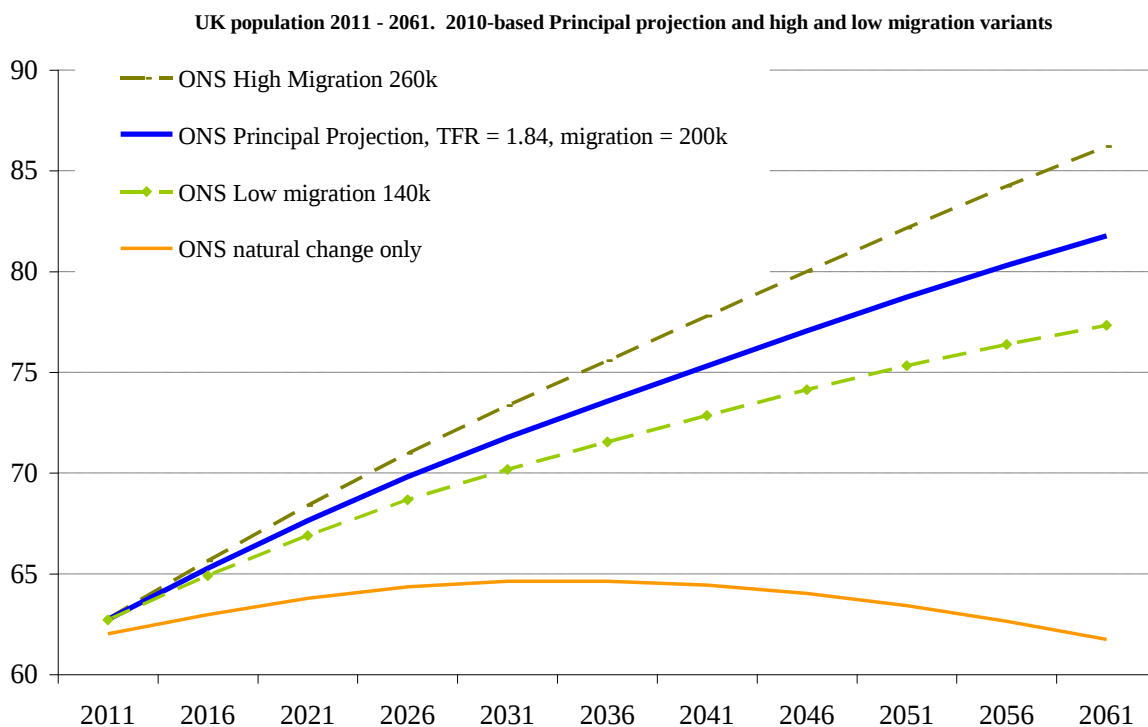


Figure 12: UK population 2011 – 2061, ONS Principal Projection and variants. Source ONS.

Given relatively high fertility, slowly falling mortality and assuming on-going net immigration, the population would continue to grow to theoretically reach 88 million in 2081 and 97 million by 2110. ONS emphasise correctly that such long-range projections are illustrative only.

According to the ONS 2010-based assumptions, life expectation for males will increase from 78.5 in 2010 to 86.8 in 2060 (8.3 years), and for women from 82.3 in 2010 to 90.1 (7.8 years).

UK household projections, based on the 2008 regional projections, extend only to 2033 (DCLG 2010). Household numbers grow faster than population as household size diminishes, from 3.01 in 1961 in the UK, to 2.33 in 2008, and is projected to fall to 2.16 in 2033. DCLG projects 26% growth in household numbers by 2033, compared with 15% growth in population. Growth is very uneven, about 10% for heads of household in middle age, more than double that for households over age 80. Of that projected overall total, 72% is due to population growth; therefore about half to immigration, 20% to age-structure changes (population ageing) and 16% to household formation ().

Key areas of uncertainty/ underlying assumptions:

Of the three main factors contributing to demographic change (birth rate, life expectancy, and migration) there seems little reason to suppose that birth rates or life expectancy will substantially alter from their current trajectories.

- **Birth rates** are affected by social attitudes or, usually unintentionally, by Government policy. The UK has never had a policy on fertility, except for a bipartisan policy to halve the rate of teenage childbearing. Welfare policy and labour market reforms to facilitate the combination of childcare with employment support the family without being pronatalist in intention. If teenage fertility does fall further, and if the birth rates of higher-fertility minority groups continue to moderate, a small reduction in TFR might follow. According to the 2011 Eurobarometer survey (Testa 2012), ideal family size for women in the UK aged 25-39 is 2.4 children. That has been (approximately) true for many years, and it has not been realised since 1970.
- **Life expectancy** is expected to continue to increase, and cohort life-tables already suggest that half of today's babies may see their hundredth birthday. However, it is possible that factors such as obesity and, potentially, antibiotic resistance, will moderate that increase. Outside chances of an epidemic, war, or other catastrophe in the UK which would substantially reduce population numbers, or of a catastrophe elsewhere which would increase UK population are beyond the reach of population projections
- **Migration** is the main area of uncertainty in projecting future demographic trends for the UK. Figure 10 shows the effects if net immigration was reduced to 90,000, 40,000, 25,000 or zero. Even with a reduction of migration to 90,000 (given the other ONS Principal Projection assumptions) population would still climb indefinitely, exceeding 70 million by 2036. If recent fertility rates of 1.95 are assumed, then a reduction of net immigration to 25,000 per year would be needed to stabilise population at about 70 million. The cost of this would be a greater imbalance between the age cohorts, with a greater number of elderly dependents for a smaller working age population (although this could be offset by a further increase in the age of pension entitlement in line with increased expectation of life).

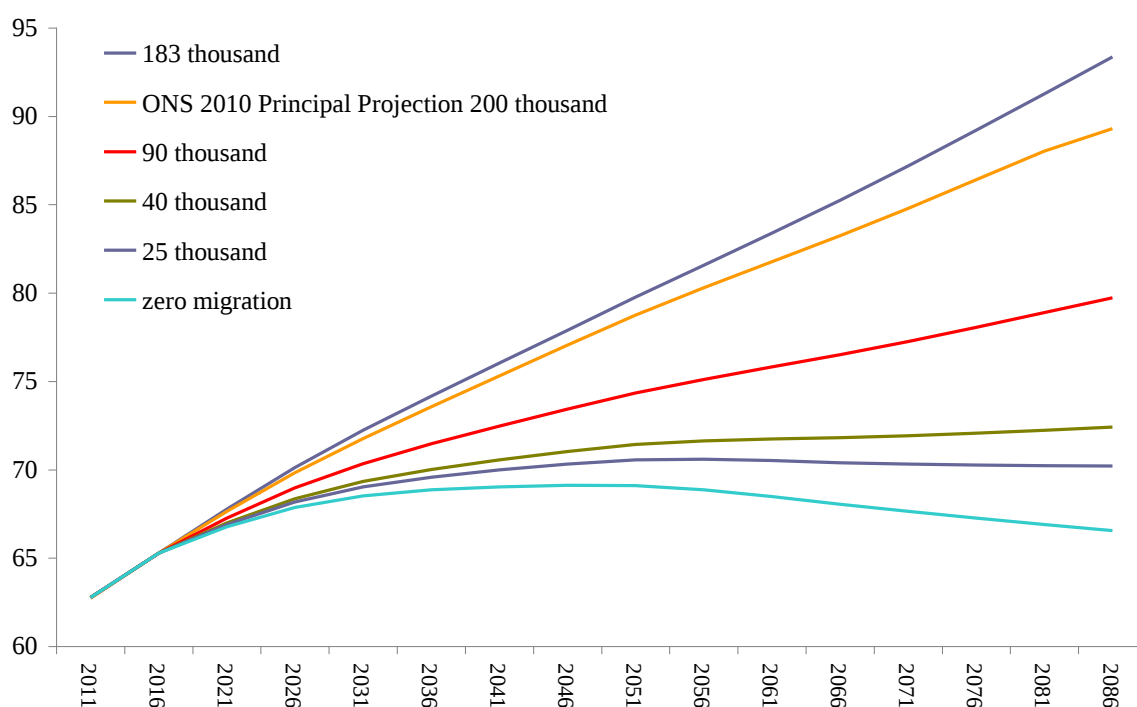


Figure 13: Projections of the UK population 2011 – 2086. Mortality according to ONS Population Projections 2010, Total Fertility Rate assumed to be 1.95 (not the ONS PP 1.84), net immigration as specified on the graph.

Plausible alternative trends:

Longer working lives

As people are predicted to live longer and have longer periods of good health, it is reasonable to suppose that working lives will become longer. Cohort life expectation for people born in 2010 is 90.2 for men and 93.7 for women (ONS 2011c). Raising the age of pension entitlement offsets some of the economic and structural problems which might arise from having a much larger, retired, elderly population. Shifting the notional working life from 15-64 to 20-69 (the same number of years in total, but later) improves the dependency ratio by exploiting an advantage in the age-structure. Increasing the age of pension entitlement back from 70 by one-tenth of a year every five years from 2031 onwards (to age 73) improves the situation further, essentially stabilising the Potential Support Ratio at 2.5. A pension entitlement age of 75 is already being discussed in Sweden (EurActiv 2013). It is important to realise that there is no 'solution' to population ageing, either by higher fertility or immigration, although both may ameliorate the problem. In particular, it is well recognised in demography that current potential support ratios cannot be sustained through immigration. f (Coleman 2002).

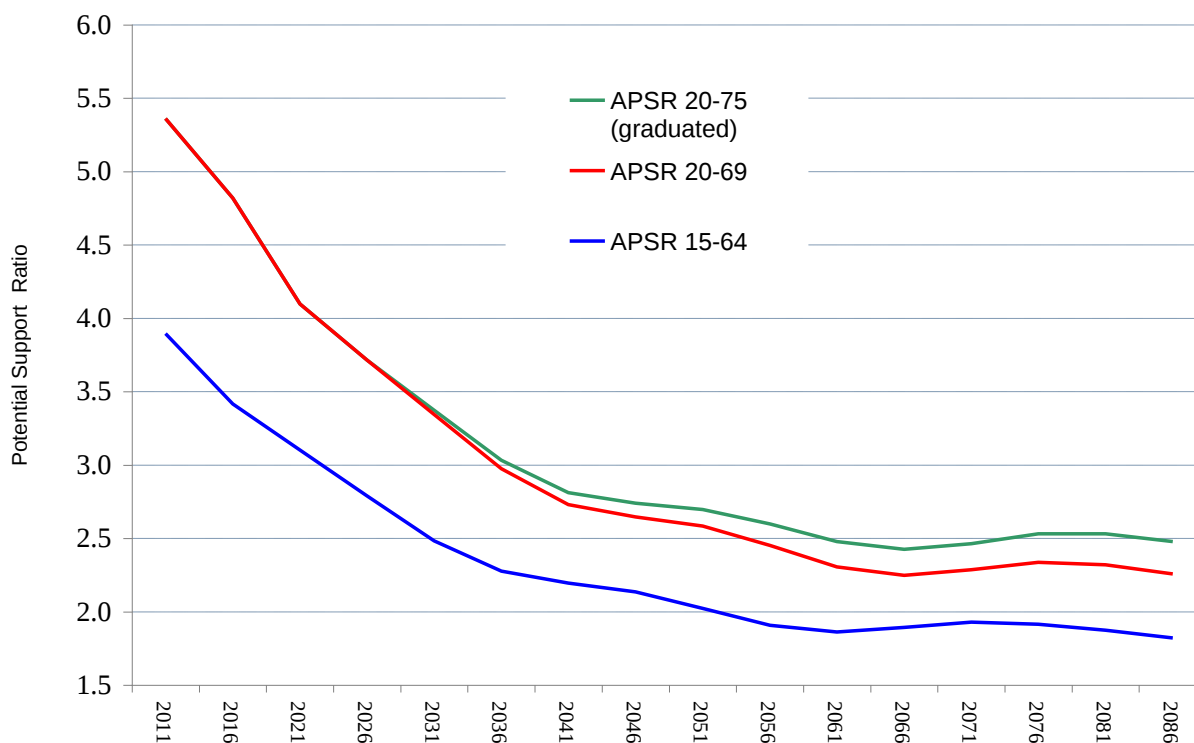


Figure 14: Potential Support Ratio UK, 2011 – 2086 on alternative retirement age assumptions.

In future, working life patterns will and must shift significantly so that working age extends beyond age 60 and even beyond 70. Governments have already begun to realise and to implement later ages of pension entitlement, although usually not as promptly as is needed and almost always against popular opposition. Employers may begin to perceive and exploit the advantages of a more elderly working cohort, with greater experience, flexibility, reliability and fewer dependents to distract them from work. However, younger cohorts may begin to resent the apparently unshifting occupation of 'top jobs' by older people reluctant to retire, which could limit their own opportunities for advancement.

Migration scenarios

It has been noted above that migration trends are among the most uncertain elements of future demographic change. It seems likely that migration into the UK will continue to some degree and that this will continue to add to the ethnic and cultural mix of the UK's population. In addition, births to those from a minority ethnic background already resident in the UK will continue to gradually increase the diversity of the UK's population. Of the additional 17 million people projected by 2051 (and 22 million by 2071), the majority would be through immigration from other countries. However, models vary considerably and there is no official ONS projection for the likely ethnic mix of the UK in the future. Various European national statistics offices, and those of the US, Canada and New Zealand, make regular official projections of ethnic change (Coleman 2006), while Philip Rees and his colleagues at Leeds University have produced exceptionally detailed projections at local authority level using a sophisticated projection method (Wohland et al. 2010). A much simpler set of projections (Coleman 2010) suggest somewhat larger ethnic growth than any of the Leeds projections. Projections of 'foreign origin' populations for all EU countries up to 2061 (Lanzieri 2011) come to intermediate conclusions.

In UK projections by Coleman, overall TFR and mortality are constrained to the ONS 2008-based Principal Projection. A 'natural change' model assumes no migration in or out, a 'balanced migration' scenario of net zero migration assumes 'White British' outflow matched by minority inflow, a 'reduced migration' scenario assumes net annual inflow reduced to 81,000, and a 'standard' scenario employs the ONS assumption of net immigration of 180,000. Ethnic fertility levels are assumed to converge. A further modification incorporates shifts in ethnic identification from minority to 'White British'.

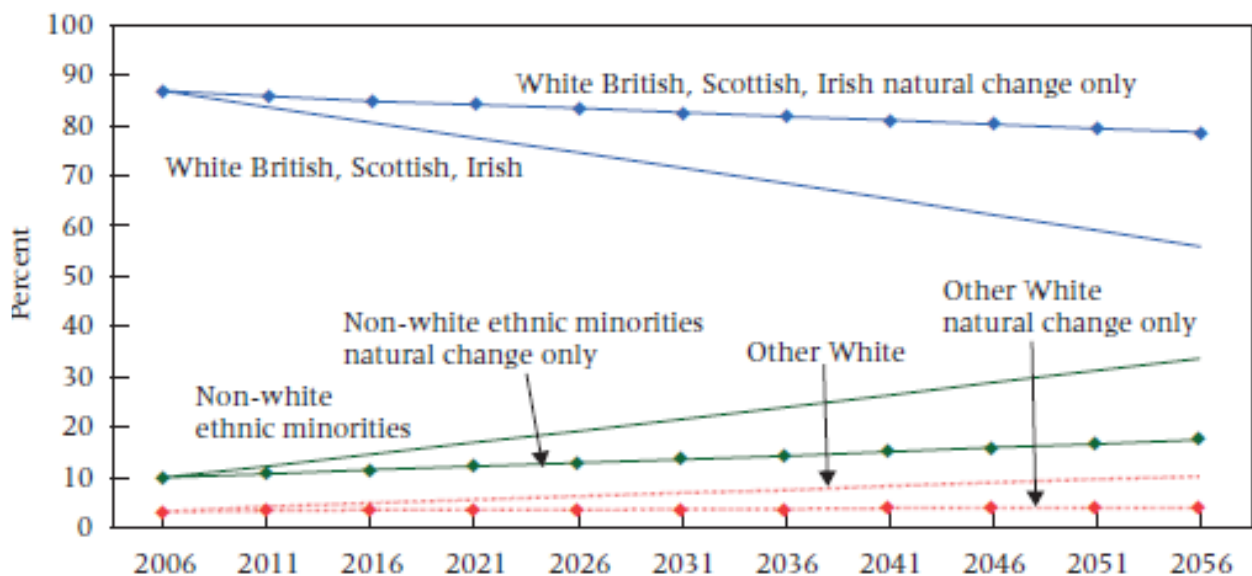
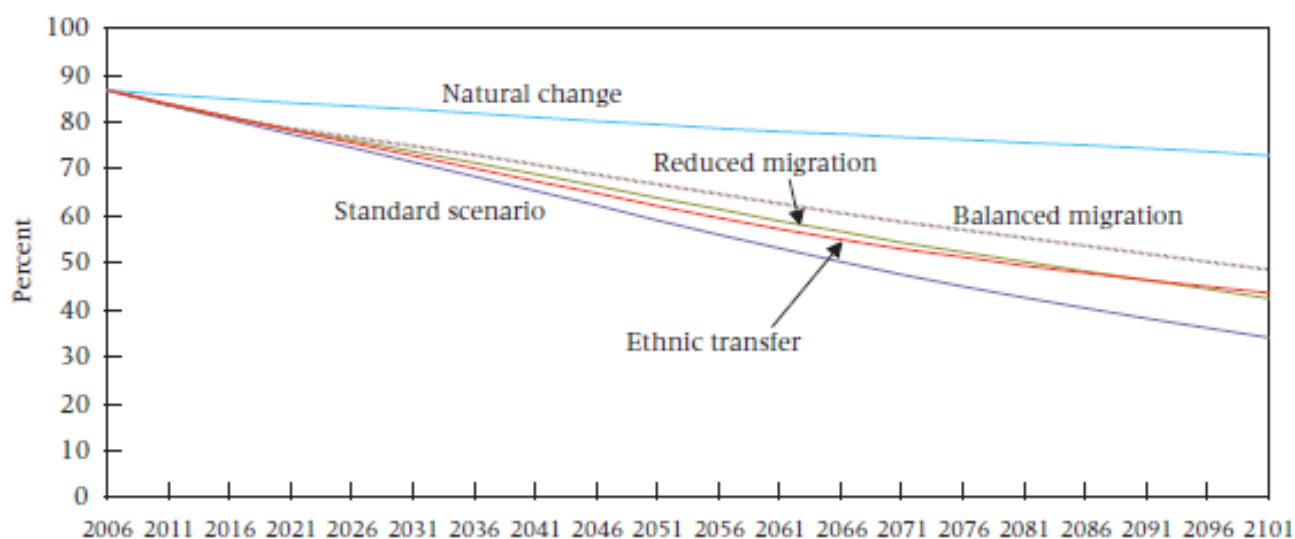


Figure 15. Percent of population in three major ethnic categories 2006–2056, standard scenario and natural change scenario. Source: Coleman 2010.

In the 'reduced migration' scenario, net immigration was approximately halved over 25 years to 81,000. That slows UK population growth but total population would still exceed 70 million by 2041 and continue to increase. Ethnic change would still proceed fairly briskly, the 'White British' share falling to 61% and the non-white minorities rising to 30% of the population by 2056. Ethnic growth would continue under the 'balanced scenario, as the age-structures and fertility rates of the inflow and outflow would differ, even though numerically the same. On that scenario the 'White British' would comprise 65% of the national total in 2056, the 'Other White' 9%, and the non-white minorities together 26%. Under the 'natural change' scenario, the ethnic minority population increases by 50% up to 2056. In the long run, all the scenarios except 'natural change' look to a future when the 'White British' would cease to be a majority in the UK, at the earliest in about 2065 in the 'standard' scenario. All these changes are considerably delayed if recent trends towards a change in ethnic identity of children from non-white parents to 'White British' are incorporated (the 'ethnic transfer'). However it should be noted that there is a high degree of uncertainty in such long-range projections, which depend on the interaction of many other factors and which can, induce radical changes in migration patterns. Furthermore, as noted earlier, the progress of integration and inter-ethnic union may increasingly blur these ethnic distinctions.



NOTE: For the "ethnic transfer" variant, rates of fertility, mortality, and migration are those of the standard scenario

Figure 16.: Long-term projections of White British population (percent) 2006–2101 under various scenarios. Source: Coleman 2010.

Conclusion

In the future demographic changes will continue to have a profound influence on the UK, including its institutions, working life, families, economics, health and wellbeing, culture, social attitudes and behaviour. The broad trend towards a UK population with larger numbers of elderly people will be an unprecedented shift away from the traditional demographic structures seen in previous centuries. The ageing of the population is unavoidable but, as the projections above show, its pace will moderate considerably as a new, partly stable age-structure is approached by mid-century. The other major departure, namely the resumption of substantial population growth in recent years and projected into the future, is by no means unavoidable. It is driven primarily by immigration, a volatile process and the only demographic component under potential policy control. The new future of ethnic and religious diversity marks another break with the past, although again depending much on the future of migration. Diversity in living arrangements, in parenting, in the family contexts in which children are brought up mark yet another departure from all past patterns. All of these have generated controversy and brought demography firmly into the political realm and into the public eye.

It will be vital for the UK Government to take into account current and projected demographic change in an integrated, joined-up and consistent way across diverse areas of policy-making, to ensure that policy is demographically aware, both in the effects of policy on population, and the influence of population on policy. The Government could also take into account the need for consistent and reliable datasets. The UK census has now passed into history, as it has in most other advanced countries (Coleman 2013). A modern welfare state with a mobile population can best be run efficiently with a continuous population register monitor which can respond to more rapid short-term trends, especially at regional and local level. (Redfern 2004). Such registers, sometimes supplemented by other sources, are operational in the Netherlands, the Scandinavian countries, Austria, Belgium, Spain and elsewhere and one is being prepared in India. A replacement for the census is also being considered in New Zealand. In the absence of a register or of a census for 2021, the ONS (2012d) is making heroic efforts to combine a variety of administrative and other

sources to fill the looming information gap. The need for a full population register may then become apparent

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ⁱ 'Period' demographic rates are those calculated for a specific year or other time-period. 'Cohort' rates are those which relate to a specific group followed over time, usually a 'birth-cohort' of those born in the same year.