

Article

Our population – Where are we? How did we get here? Where are we going?

How the UK's population has changed since the start of the 20th century.

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1 . Introduction

Here at the ONS, we measure the size, structure and characteristics of our population. We track changes over time and calculate future projections based on current trends. Our analyses, released throughout the year in numerous publications, help to inform critical public policy debates and decisions. And with many statistics stretching back decades, they can help us to tell the story of how our population has changed.

In the last year or so, for example, we have reported significant milestones which have real repercussions. The birth rate across the country is at its lowest ever recorded level. The previously nearly uninterrupted 100 year rise in average [life expectancy](#) has been stalling during the last decade. However, there were more [births](#) than [deaths](#) in 2018.

International migration has been a topic of highly charged debate and policymaking for decades. This was amplified in the build-up to and outcome of the referendum on United Kingdom's membership of the EU. Our [latest data](#) indicate that migration from the EU has fallen significantly since 2016, while migration from elsewhere has increased.

How do we start to make sense of these developments? How can we explain what sometimes appear to be contradictory statistics? What might this mean to the current and future structure of our population?

This article brings together the main themes of UK demography and draws out the linkages between them. First, we look at how the population has changed over time. Secondly, we look in more detail at births, deaths and migration; these are the three main pillars underpinning the size and structure of any population. Finally, we relate these to a standard model for understanding population change, before considering how far it is possible to project forward what this means for the future.

The statistics that we present are at the UK or England and Wales level. We do not examine how those trends have differed spatially across the UK or, therefore, how geographical differences have reflected different social and economic drivers in different areas at different times. Birth rates, death rates, patterns of migration and population structures can differ substantially from place to place. An examination of geographical differences would be the topic of a more in-depth piece.

This article is being published during the coronavirus (COVID-19) outbreak. The importance of statistics on vulnerable populations and mortality patterns across the country is reinforced at this time. Statistics on the population matter.

2 . Births and Deaths since 1901

The size and structure of the population of the UK has changed fundamentally since the early 1900s. Over that time, for a variety of reasons, there have been rises and falls in the numbers of births, deaths and migration. The overall effects of these changing dynamics can be seen in the population pyramids for England and Wales (Figure 1).

Figure 1: The population has changed considerably over the last 100 years

Population estimates, UK, 1901, 1951 and 2018

Notes:

1. There are no figures available for Northern Ireland prior to 1911. Figures prior to 1911 include Eire (Northern Ireland and The Irish Free State).

In 1901, the structure of the population was a traditional "triangle shape" with the highest numbers of people in childhood (32% aged under 15 years) and a comparatively small number of people in older age (5% aged over 64 years).

Despite an overall population just over half its current size, much higher birth rates meant that the number of babies and infants was higher than we see today. The big drop seen between the number of babies and the number of slightly older children reflected much higher levels of infant mortality, as 14% of all babies born did not survive beyond their first birthday.

Death rates at all ages were much higher than they are today, meaning that the size of the remaining population at each older age was much smaller. People could not expect to live for as long as they do now. [Life expectancy](#) at birth in England and Wales in 1901 was around 45 years for men and 49 years for women. Since then, life expectancy has risen to around 79 years for men and 83 years for women.

Our population today has a very different structure. In 2018, the proportions of people aged under 15 years and over 64 years were the same (18%). The impacts of two World Wars, the "baby boom" generations, improvements in health care, ups and downs in the economy, and improvements in living standards have created a population pyramid with distinctive patterns at certain ages. It is a population that is generally more evenly spread across different ages, with many more people at older ages.

In addition to live births and deaths, international migration patterns have also affected the size and structure of the population, most noticeably during the last 20 to 25 years. Most immigrants tend to be of working and childbearing ages. This has given a recent boost to the resident population at these ages and to the number of births that result, as people build lives and, in some cases, start families in the UK.

There has been a declining number of births

Since 1901, the number of births has tended to decline. But the pattern of births in the last 120 years has shown significant variability (Figure 2).

Figure 2: The numbers of births have varied over time

Number of live births, UK, 1901 to 2018

The number of births fell significantly during World War 1 (WW1) and to a lesser extent during the early years of World War 2 (WW2). Following a return to peacetime, there were "baby booms" in the early 1920s and the late 1940s. The UK emerged from its long years of post-war rationing during the 1950s, and there was a third and extended baby boom during the 1960s.

The 1960s heralded a growing economy with greater equality of opportunity, new housing options, an established welfare state and national health service acting as a safety net. It also saw social and cultural change, with traditional female roles beginning to change alongside new opportunities for women in the workplace. Alongside the introduction of the contraceptive pill, women began to have greater choice over having children.

In the 1970s, there was a rapid fall in the number of births. This coincided with a faltering economy but also followed the [Abortion Act 1967](#) coming into effect in 1968 and more widespread availability of new forms of contraception. In 1968, there were around 25,000 abortions recorded in Great Britain, compared with 219,000 in 2018.

The last 40 years has been a period of less dramatic fluctuations. The increase in births through the 1980s was an echo of the 1960s' baby boom, as there were greater numbers of childbearing-aged adults. Similarly, the increase in births during the early years of the 21st century was reflective of migration increasing the numbers of younger adults in the population. Both the late 1980s and the early 2000s saw economic renewal and growth, which may also have given small boosts to the numbers of births.

There are many reasons why the number of births has been decreasing. As already noted, changes in society, such as the greater availability and acceptability of contraception and abortion, opportunities for higher education, and greater equality in the workplace, have given women much greater choice. At the same time, the costs of housing and childcare have increased in recent decades as we have moved away from a tradition of "stay at home" mothers to a new normal where both parents are often in paid employment. These events or [milestones](#) have implications for the life course and events that interrelate with childbearing. Parents are generally having their first child much later than they did 50 years ago.

The average age at which a woman has her first child in England and Wales has risen from around 24 years of age in the 1960s and 1970s to around 29 years of age now. Also, the average age of all women giving birth has risen from around 27 years of age to just under 31 years of age now. Just over 10% of all births were to teenage mothers 50 years ago, a figure that has dropped rapidly in recent years to now stand at under 3%.

These shifts in the ages at which women give birth are reflected historically in changes to marriage rates. Just under 30% of all women were married by 20 years of age 50 years ago, more than 80% were married by 25 years of age, and over 90% were married by 30 years of age ([Table 12](#)). Today, marriage rates are much lower and the age at which people get married tends to be higher. Less than 1% of all women are now married by 20 years of age, under 10% by 25 years of age, and just over 30% by 30 years of age. Less than 5% of babies born during the 1950s were [born outside marriage](#) and less than 10% until 1978, whereas [almost 50%](#) are now. Cohabitation has become socially acceptable and can be a precursor to, or a replacement for, marriages and civil partnerships.

The age at which [childbearing](#) starts is an important factor in the number of children a woman might subsequently have. Fertility declines with age, so the consequence of delaying childbirth means that some women have fewer children than they might have had if their first child had been born earlier. If the age-specific fertility rates of the 1960s had persisted, women would, on average, have each given birth to around 2.8 children. This measure, the total fertility rate, today stands at 1.7 children per woman.

These rates include all women, including those who do not have any children. Between 1930 and 1940, approximately 12% of all women (at the end of their childbearing years) remained childless, a figure that has ranged between 10% and 20% in the years since. Of those born in 1973, who might reasonably be expected to have finished having children by now, 19% are [childless](#).

Since the late 1990s, international immigration has been high relative to previous years. The most common ages of those migrating to the UK reflect the ages that people are likely to have children. One general effect of international migration to the UK has, therefore, been an increase in the number of women of childbearing age. In turn, this has increased both the [overall number of births](#) and the proportion of births to parents who were born overseas, a figure that has risen from around 12% of all births to 28% in the last 30 years.

The number of children in first-generation migrant families may more closely reflect birth and fertility rates in the countries from which they left, but this may be higher or lower than fertility in the UK. Fertility rates in many European countries are lower than those in the UK, whereas rates in African and some Asian countries are higher. [Academic research](#) suggests that subsequent generations more closely align with patterns in the UK. Furthermore, other research has found [timing of fertility](#) varies considerably over the life course, with migrants waiting to have children after they move, which can give a false impression of overall fertility when data are looked at for individual years.

While the number of births in the UK has increased as a result of international immigration, there will also be emigrants from the UK who have had children abroad (and would likely have had children in the UK if they had not emigrated). Limited data are available on the numbers of children born abroad to UK-born parents, so the net impact of migration (immigration and emigration) on the number of births in the UK cannot currently be measured.

Deaths

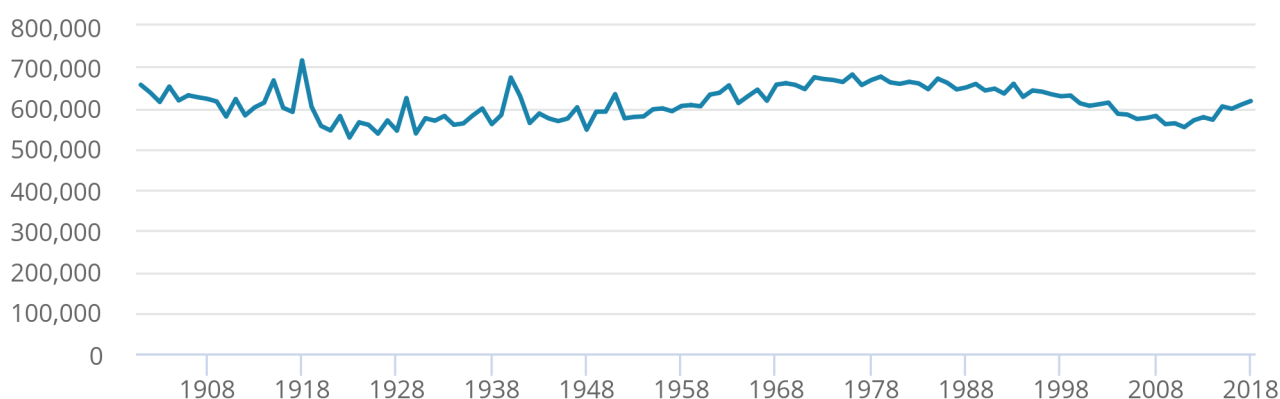
Figure 3 shows the number of deaths registered in the UK since 1901. The pattern of deaths is much more stable over time than the pattern of births, with fewer peaks and troughs.

Figure 3. The pattern of deaths is relatively stable over time

Number of deaths in the UK, 1901 to 2018

Figure 3. The pattern of deaths is relatively stable over time

Number of deaths in the UK, 1901 to 2018



Source: Office for National Statistics – Vital statistics in the UK: births, deaths and marriages

Numbers of deaths are affected by: population size and structure; public health and advances in medical science; and events such as pandemics (for example, Spanish flu) and wars. But although it is estimated that over 800,000 members of the British Armed Forces were killed in [WW1](#) and over 300,000 in [WW2](#), Figure 3 shows far fewer deaths in our figures. This is because members of the British Armed Forces who died overseas did not generally have their deaths registered in the UK. Peaks for deaths registered in the UK during the war years coincide with the outbreak of the Spanish flu pandemic in 1918 and the Blitz in 1940. However, we can trace the impact of these deaths on the later structure of the UK population. For example, there is a marked indentation in the number of males and females aged between 30 and 40 years in the 1951 population pyramid in Figure 1.

The total number of deaths registered in 2018 was lower than the number of deaths registered at the start of the 20th century, and yet the population is now twice as large. This means that mortality rates (deaths in the population as a whole) were historically much higher. People died in greater numbers at younger ages, from infancy and childhood through to adulthood.

This is most starkly evident by looking at how life expectancy has changed over time (Figure 4). In the mid-19th century, average life expectancy at birth was only 40 years for males and 42 years for females. By 1901, this had risen to 45 years for males and 49 years for females. It should be noted that these are averages that are impacted by high infant and child mortality in historical figures – some people still lived to their 70s and 80s in the 19th and early 20th centuries. The 20th century and first decade of the 21st century saw significant advances in medical science as well as better sanitation, nutrition, hygiene and welfare support. By 2011, average life expectancy at birth had risen to 79 years for males and 83 years for females.

Figure 4: Life expectancy has increased over time

Life expectancy at birth, England and Wales, 1841 to 2011

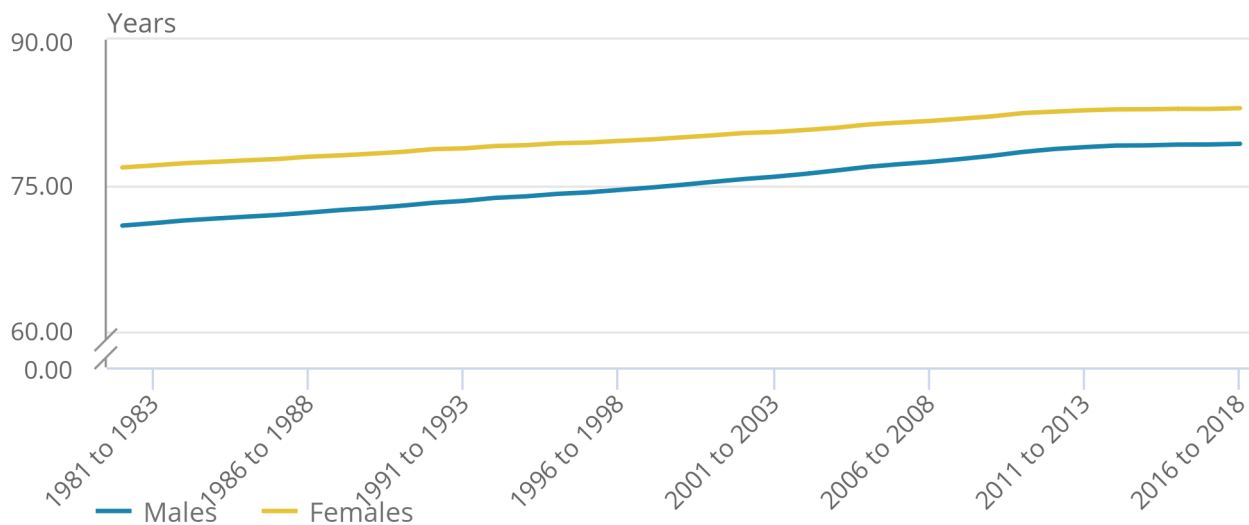
From around 2011, there has been a [statistically significant](#) slowdown to the long-term improvements in mortality rates seen since the turn of the 20th century (Figure 5). This slowdown has been common to both males and females and has been seen at all ages, not just among the elderly.

Figure 5. Improvements to life expectancy have recently slowed

Life expectancy at birth for males and females, UK, 1980 to 1982 and 2016 to 2018

Figure 5. Improvements to life expectancy have recently slowed

Life expectancy at birth for males and females, UK, 1980 to 1982 and 2016 to 2018



Source: Office for National Statistics – National Life Tables

The slowdown in life expectancy improvements in the UK since 2011 is a phenomenon that has also occurred elsewhere. However, it has been more pronounced in the UK than other similarly developed countries. Some have suggested that the natural limits of human lifespan may have been reached. But countries such as Japan, Italy, Switzerland and Denmark have some of the highest life expectancies in the world and yet both have continued to see gains in lifespan during this period. By contrast, the richest country in the world, the US, has some of the lowest levels of [life expectancy](#) among similarly developed countries, a situation worsened by having seen virtually no improvements during the 2010s.

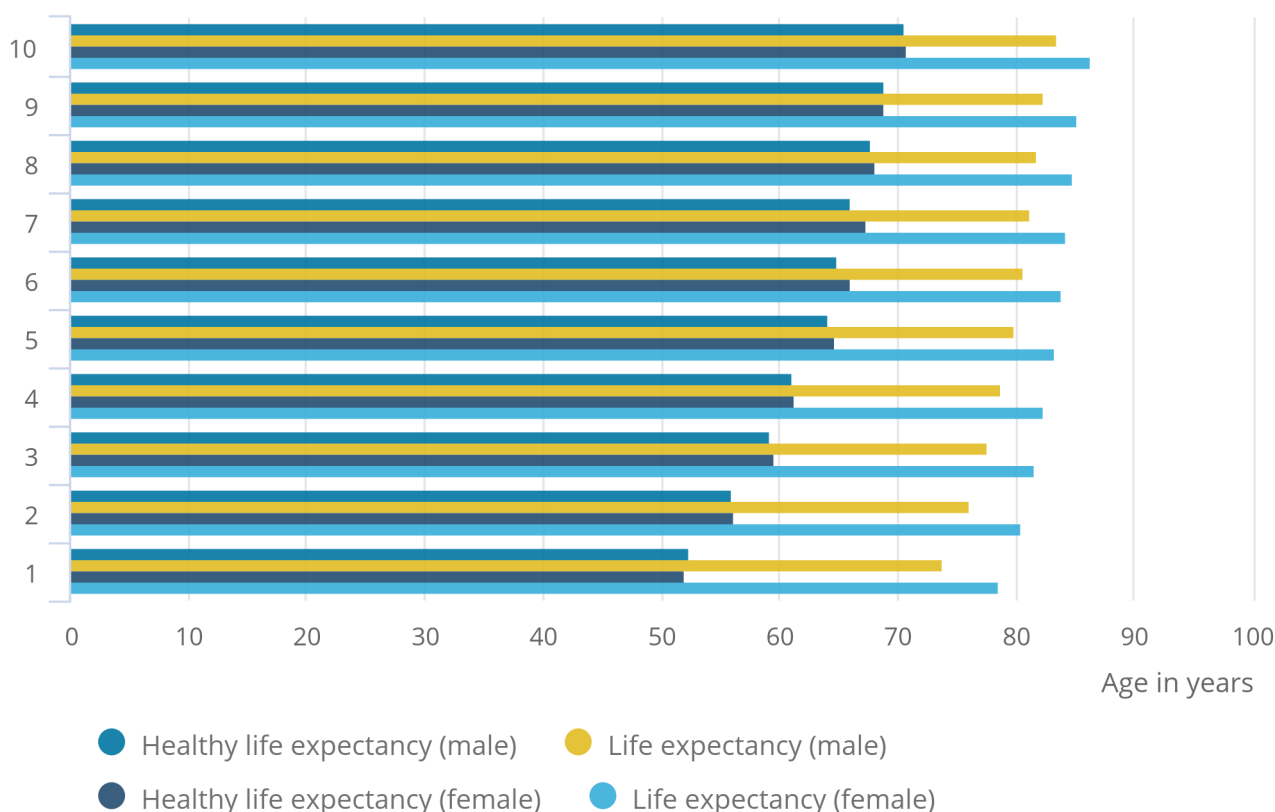
Recent analysis has also shown that inequalities in life expectancy are widening. Since the 2010s, improvements in life expectancy have been much slower in more deprived areas than in less deprived areas of England and Wales. In the most deprived areas, female life expectancy has decreased. Social, economic, environmental and commercial conditions, the "wider determinants" of health, act together to influence health outcomes. Our latest analysis shows both significant and widening differences in both life expectancy and healthy life expectancy based on area deprivation (Figure 6).

Figure 6: There are differences in life expectancy based on area deprivation

Life expectancy and healthy life expectancy for females, by decile of Index of Multiple Deprivation, England, 2015 to 2017

Figure 6: There are differences in life expectancy based on area deprivation

Life expectancy and healthy life expectancy for females, by decile of Index of Multiple Deprivation, England, 2015 to 2017



Source: Office for National Statistics – Health state life expectancies by national deprivation deciles

The UK's population is ageing, with increasing numbers of people aged in their 70s and older (Figure 1). As the first of the post-WW2 baby boom generations are now reaching that age, and the number of deaths across the country has started to rise in the last few years (Figure 3), we are seeing a stalling in life expectancy improvements.

What people died of a century ago was also very different to what people die of today. Advances in medical science and changes to the way that we live our lives, combined with a more comprehensive system for classifying and reporting causes of death, have had a profound impact on how those causes have changed.

Figure 7: The causes of death have changed over time

Top 10 causes of death by age and sex, UK, 1915 to 2015

Until 1945, infections were generally the leading cause of death for what we now consider to be young and middle-aged males and females (Figure 7). Alongside the transformation in treating infections enabled by the development of antibiotics, there was a dramatic decline in the number of people dying from infectious diseases after the introduction of population-wide childhood immunisation programmes.

Motor vehicle incidents emerged as a leading cause of death in children and younger adults during the second half of the 20th century until improvements in road, vehicle and driver safety (such as laws requiring the wearing of seatbelts) began to be introduced. From the 1980s onwards, external causes of death, such as drug misuse, suicide and self-harm, have now become the leading cause of death at younger ages, particularly among younger men.

Heart conditions dominated as the leading cause of death for middle- to older-aged males from 1945 onwards, with a similar trend for women but at older ages. Younger to middle-aged females more frequently died of cancer, which in recent decades has become the most prevalent cause of death at older ages too. Changes over time in the proportion of the population who smoke are likely to have influenced the number of deaths from both heart conditions and cancer.

In the last decade, dementia and Alzheimer disease has become the leading cause of death [group](#) for women aged over 80 years. The prevalence of dementia at older ages is such that it is now the leading cause of death in females overall. In 2018, dementia also became the leading cause of death for males aged over 80 years and the second leading cause of death in males overall. A better understanding of dementia and improved diagnosis is likely to have increased reporting of dementia on death certificates. As the population ages, with people living longer than before and surviving other illnesses and diseases, dementia is more likely to occur.

3 . Migration

Migration is the movement of people from one place to another with the intention of settling, either permanently or temporarily. It is generally understood to involve a move of some distance. We do not tend to think of ourselves as migrants if we move within our locality, to another part of town, or to and from the surrounding countryside. But most migration is domestic: people moving to a different place in the same country. There are many patterns of domestic or internal migration, patterns that affect both the population size and structure of different parts of the country. They are the reason why, on average, most cities in the UK have a younger population than most market towns or rural areas. These patterns have changed over time, reflecting changes to our economy and society.

When people move residence from one country to another, they become international migrants. Such movers are termed "immigrants" in the country they have moved to or "emigrants" in the country they have moved from. People move for varied and personal reasons. As children we move because our parents do. As we get older, we might move to be closer to our own children and grandchildren, who themselves might have moved away from "home" at a previous time in their own lives. Or to escape to the country, now that we've retired. Later, we might have to move for medical or care reasons. We might move as young adults to take up full-time university education, at the time we form or end a partnership or marriage, or as we become parents if we need more space. We might move to take up a new job, to be closer to where our place of work is, or to seek employment in a place that seems to have better prospects. We might move because we can't afford to support ourselves anymore where we currently live. Or to try and earn money elsewhere, in order to support the family we are leaving behind. We might move because external events such as wars, civil unrest and persecution, or food and water shortages, have made it untenable or unsafe to remain where we were. Whilst some people are happy to move to seek a better life, many others move because they have to, rather than want to.

When people move from one nation state to another for 12 months or longer, this is called "long-term international migration", the focus of this section. International migration to and from the UK changes the size and composition of the population. At scale, this can lead to substantial population change. Since many people move for education or work reasons, high levels of migration can have a large impact on the age profile of populations.

Migrants' age, sex and reasons for migration are among the main factors that determine wider demographic impacts. Generally, migrants add to the stock of those in the main working ages, with immigration seen to offset the effects of an ageing population. While this is true in the [short to medium term](#), immigrants also age. And with population ageing and falling fertility rates occurring globally, migrant profiles may change in the future. The reasons why people migrate can also affect how long they stay. For example, people who migrate for work or study reasons may be less likely to have children soon after migrating than those who move for family reasons or to accompany or join a partner.

Length of stay in a country is important because it separates migrants who contribute to the current and future structure of the population from short-term visitors. We use the UN-recommended [definition of a long-term international migrant](#): "A person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence."

Figure 8 shows data from our Long-Term International Migration statistics covering migration to and from the UK since 1964, when the current method of estimating migration using the International Passenger Survey (IPS) started¹. An important measure is net migration, the difference between the number of migrants arriving and leaving. When immigration is higher than emigration (that is, when more people arrive in the UK than depart), net migration is positive and the UK population grows.

Figure 8: More people have been moving to the UK than leaving since 1994

Long-Term International Migration, to and from the UK, 1964 to 2018

Notes for Migration

1. We are currently transforming our population and migration statistics by utilising new data-sharing powers, to link a range of government data sources in an integrated system.

4 . Patterns of migration into and out of the UK by decade

Pre-1950s

In the 1951 Census of England and Wales, there were 492,000 Irish-born residents, accounting for more than a quarter (26%) of all foreign-born residents. Migration of Irish-born to Great Britain stretches back to the famine of the 1840s in Ireland and was associated with rapid industrialisation in Great Britain throughout the 19th century.

Those born in Poland were the second highest ranking non-UK born group in 1951, accounting for 8% (152,000) of all foreign-born residents; this was the result of Polish migrants arriving both during and after World War Two (WW2), mainly former service personnel who had fled Poland in 1939.

India was the third highest ranking non-UK country of birth in 1951. Many of these migrants were the children of British service personnel born in India before independence in 1947. German and Russian-born ranked fourth and fifth, respectively, in 1951.

1950s

During the 1950s, increasing numbers of Irish and Caribbean-born migrants arrived in the UK. Between 1951 and 1961, the Irish-born population increased by 39% to 683,000. The Jamaican-born population increased from 6,000 to 100,000 between 1951 and 1961, a more than 16-fold increase. In 1961, the total Caribbean-born population in England and Wales was 172,000. The inflow of Jamaican-born migrants continued into the 1960s, with their number increasing another 71% between 1961 and 1971. The main reasons for emigration from the Caribbean nations to the UK were economic, both "push" and "pull". Further migrants arrived to join relatives from the Caribbean.

In 1961, Cyprus entered the top 10 non-UK countries of birth; this number increased in the subsequent censuses. Many Cypriots fled the island following the outbreak of civil war in 1955, which continued through to the early 1970s.

1960s and 1970s

Indian-born residents had the largest between-census percentage increase (almost doubling) between 1961 and 1971. By 1971, the Indian-born population represented 10% of all foreign-born residents in England and Wales.

The Pakistani-born population more than quadrupled during the 1960s, becoming the fifth highest ranking non-UK country of birth in 1971. This increase in the Pakistani-born population during the 1960s may partly relate to the war with India in 1965, and the "pull" of employment in the UK. There has been continued migration from India and Pakistan in the following decades.

The Kenyan-born population in England and Wales began to increase during the 1960s; many of these migrants were East African Asians (descendants of migrants from the Indian sub-continent who had settled in East Africa during the British colonial administration) who had experienced discrimination in Kenya. This Kenyan-born population rose still further in the 1970s.

People from the Commonwealth had been encouraged to come to the UK after WW2 because of labour shortages. But through the 1960s, they became subject to increasing controls. The [Commonwealth Immigrants Act 1968](#) required migrants to have a "substantial connection with the United Kingdom".

In 1973, the UK (along with the Republic of Ireland and Denmark) joined the European Economic Community, the same year as the oil crisis caused a recession and unemployment to rise.

The Ugandan-born population increased as a result of forced expulsion of Ugandan-born Asians by the Amin regime in 1972. There were also notable increases in the Tanzanian-born population, which may lie in disruptions to food supplies as a result of droughts and famines in this period, and the Zimbabwean-born population, owing to instability during the Zimbabwean independence war. The Iranian revolution is likely to be a significant reason for a peak in arrivals from Iran in the late 1970s.

Between 1945 and 1982, UK citizens were encouraged to relocate to Australia to populate the country and increase the labour force. The Assisted Passage Migration Scheme meant adults could get a ticket for just £10, while children went free. But once you were there, you had to stay for two years. Over 1.5 million people took the risk and became known as the "Ten Pound Poms". As a result, net migration was negative through the 1960s. Some famous Ten Pound Poms are the former Australian Prime Minister Julia Gillard and the Bee Gees.

1980s and 1990s

During the 1980s and 1990s, net migration was at a relatively low level. The 1991 Census showed an increase in the number of those born in Bangladesh through the 1980s, reflecting the effects of the Bangladeshi war of independence during the 1970s, subsequent military coup, and poverty and instability in the country.

Since 1994, net migration has been positive, meaning that the number of people arriving in the UK has been greater than the number leaving each year. In the latter part of the 1990s, there were migrant flows in the 1997 to 2000 period associated with the war in Kosovo. The Maastricht Treaty introduced freedom of movement and residence for persons across the EU.

2000s and 2010s

Since the 1990s, immigration and emigration have increased. There has been an increase in British citizens emigrating to countries such as France and Spain as a result of freedom of movement within the EU. Some increases in recent migration flows have coincided with the accession of new countries to the EU, notably the accession of eight central and eastern European countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia) along with Cyprus and Malta to the EU in May 2004. In January 2007, Bulgaria and Romania (the EU2) joined the EU. Migrants coming to the UK from Bulgaria and Romania were initially subject to transitional employment restrictions, which placed limits on the type of employment they could undertake.

Since the 1990s, there have been increasing numbers of international migrants coming to the UK for work and study reasons. During the 2000s, there were increases in the Nigerian-born population. The reasons for this are complex, but they may include the restoration of democracy in 1999, civil conflict, the economic opportunities afforded by migration to the UK and the rapid population growth in Nigeria leading to a larger pool of potential migrants. Increases in immigration during the first decade of the current century can be seen from several countries, relating closely to important political changes. This includes Nepalese-born residents and those from the Philippines, which may have been fuelled by economic uncertainty in the Philippines.

Chinese-born residents more than doubled during the period 1991 to 2001, and there was a further marked increase to 2011. There have been increases in those coming from China to study.

Recent migration

Since 2016, long-term immigration, emigration and net migration have remained broadly stable. However, different patterns for EU and non-EU migration have emerged since 2016, when the EU referendum took place. The [Migration Statistics Quarterly Report: February 2020](#) shows that while there are still more EU citizens moving to the UK than leaving, EU net migration has fallen since 2016, caused by fewer EU arrivals for work. In contrast, non-EU net migration has gradually increased over the past six years, largely as more non-EU citizens came to study.

Decisions to migrate are complex, and a person's decision to move to or from the UK will always be influenced by a range of factors, including work, study and family reasons. There is also a rapidly changing policy context around migration – including the government's plans for a [new immigration system](#) once the UK exits the EU – that means there is a growing need to understand how migration is changing and the impact our changing population has on society and the economy. This is why the Office for National Statistics (ONS) is collaborating with the Government Statistical Service (GSS) to [transform population and migration statistics](#) and put administrative data at the core of our statistics. As part of this transformation work, we are also reviewing what our statistics measure and the concepts and definitions we use to understand migration, which are currently largely focused on standard definitions of Long-Term (LTIM) and Short-Term (STIM) International Migration, and we are considering whether additional or alternative definitions will help to better reflect the complexity of how and why people move to and from the UK.

5 . Summary

A simple conceptual framework for understanding the dynamics of population change over time is the Demographic Transition Model. The model focusses solely on birth rates and death rates to explain how population growth goes through significant stages as a country develops economically and socially (Figure 9).

Figure 9: The Demographic Transition Model

In the early 20th century, the UK could be generalised as moving from stage 2 to stage 3 of the model. Medical advances had started to reduce death rates and, although birth rates remained high, they were starting to reduce too. This period was still characterised by rapid population growth. By the middle of the century, the country was moving into stage 4. Birth and death rates were now much lower. The post-war economy was strengthening, with improvements to public services and, as the decades moved on, an increasing proportion of working women in the labour market.

Bringing both births and deaths in the UK together shows that reality paints a more complex picture than the model suggests (Figure 10).

Figure 10: The UK's population shows a more complex picture

UK demographic transition, 1901 to 2018

Birth and death rates broadly moved towards each other from the start of the 20th century and by 1977, they had reached the same level. But the journey to this point had been punctuated by external events, which the model's view of the world does not capture. As we have explored in earlier sections, the impacts of war, pandemics, economic performance, medical and public health advances, and social, cultural and political change have all impacted on both births and deaths in different ways at different times.

Although the period from the late 1970s until the turn of the 21st century was marked by some natural increase in the population, this was largely an echo of the previous baby boom. As those "baby boomers" moved into adulthood and parenthood, they were part of a bigger population of childbearing age than the generation that preceded them.

However, the picture since the turn of the millennium highlights the other simplification of the Demographic Transition Model. It assumes a country exists in isolation, with no account taken of the third pillar of population change: migration. Figure 11 combines the number of births and deaths together to give an annual level of natural change in the population and adds net migration into our analysis.

Figure 11: The drivers of population change in the UK

UK population estimates, natural change and net migration, 1901 to 2018

Migration also has a secondary impact on the size and structure of the population via its subsequent effect on births. Where younger immigrants settle long term in their country of destination, they put down roots and may start families of their own. This goes some way to explaining why the UK is currently at or near record low birth rates and fertility rates, and yet the number of births is still significantly higher than the number of deaths.

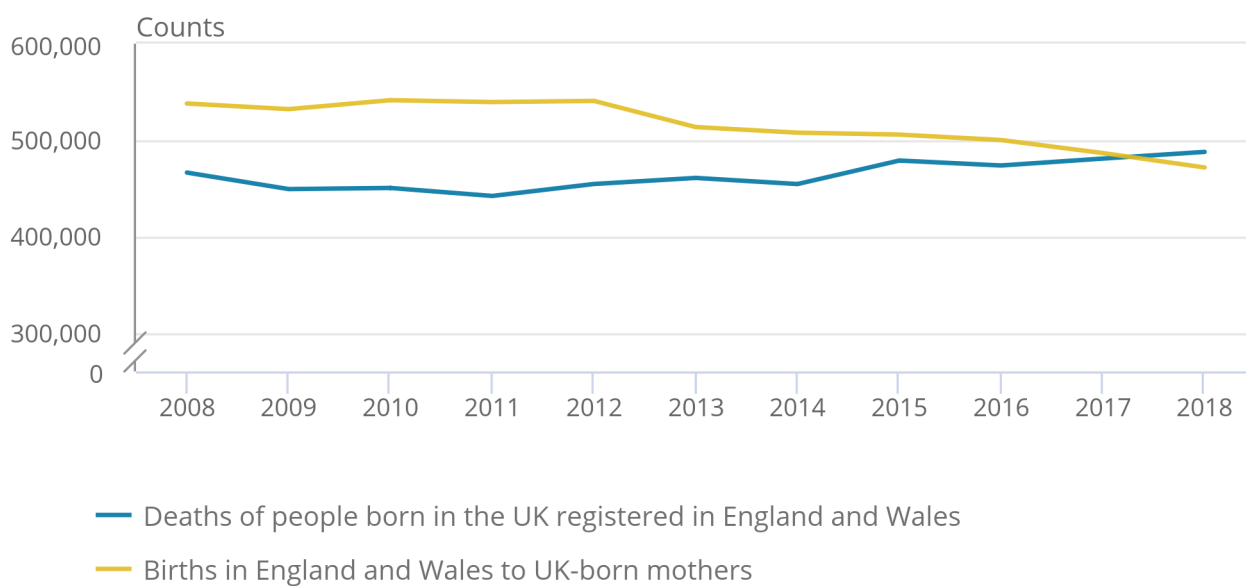
In England and Wales, for example, when comparing births to UK-born mothers only against the deaths of people who were born in the UK, 2018 saw the first natural decrease (more deaths than births) since comparable datasets were first available in 2008 (Figure 12). In 2018, there were 471,476 live births to UK-born mothers and [487,618 deaths of UK-born persons](#) registered in England and Wales.

Figure 12. Deaths of people born in the UK now exceed the number of births to UK-born mothers

Number of births to UK-born mothers and deaths of people born in the UK, 2008 to 2018

Figure 12. Deaths of people born in the UK now exceed the number of births to UK-born mothers

Number of births to UK-born mothers and deaths of people born in the UK, 2008 to 2018



Source: Office for National Statistics – Births and deaths in England and Wales

6 . Significance and future implications

How and why the population is changing is important since it helps to inform decisions that affect people's lives in the UK. An increasing number of people living to older ages has implications for the provision of services such as health care, social care, housing and transport. But it also presents opportunities for older people to contribute to the labour market for longer, to form new relationships or to be more involved in their communities through activities such as volunteering. It also enables people to provide long-term care and childcare to family members.

Historical improvements in life expectancy have affected the cost and affordability of pensions, a situation reflected in recent changes to the State Pension age. But [healthy life expectancy estimates](#) also need to be taken into consideration.

International migration and its contribution to and impact on society and the economy is a complex topic. Migration adds to the size of the working age population, and work (either seeking work or having a definite job to go to) is one of the most common reasons for migration. Research has also shown that migrants form an important part of the workforce, including in [essential services such as health care](#). The contribution and impact that migration has on infrastructure and public services (for example, on housing, education and health care) and on [the UK economy](#) (in terms of tax receipts, spending and benefits) is also an important area of interest.

So, what can we take from past and more recent trends that have affected our population? What might the future look like?

Our future population

The last 100 years or so witnessed unprecedented change. It is not possible to say with certainty how the population will look in the future. However, recent trends in births, deaths and migration can help to form a set of assumptions about how they will shape the future population. These trends are projected forwards and provide a view on how the UK population may look if these assumptions were true. The latest set of [national population projections](#) suggest that the UK population may reach 70 million by 2031 and that the population aged 85 years and over is projected to almost double over the next 25 years from 1.6 million to 3 million, partly because of the post-war baby boom generation reaching their 80s (Figure 13).

Figure 13: The population aged over 85 years is projected to almost double over the next 25 years

The actual and projected UK population, by age, 2018 and 2043

The low number of births in the early 2000s is reflected in the low number of teenagers in 2018 and the projected number of people in their 40s in 25 years' time. The projected increase in the number aged in their 70s and 80s in 2043 reflects the higher number of births in the 1960s. This is also likely to result in a higher number of deaths as this baby boom generation reach old age.

The proportion of people in older ages is important to measure since they are likely to have a greater need for health and social care, pensions, housing adaptations, and public transport. Public funding will come via taxes paid from those who are working and spending in the economy. The Old Age Dependency Ratio is a well-used measure of the population above State Pension age per 1,000 people aged 16 years to the State Pension age. However, it does not take account of the increasing number of people aged above the State Pension age who continue working and the number of people below the State Pension age who are not working. An [alternative measure](#) that accounts for these shows that the increasing number of older people who continue working reduces the perceived "dependency" of an ageing population on the younger generations.

Figure 13 is a projected structure of the population. It is not a prediction or an estimate of the future. Fundamentally, it is based on our observations of trends over time. However, as we have seen when we have looked in more depth at births, deaths and migration, unpredictable things happen that can alter population dynamics in both the short and long term. Projecting trends forward is an important starting point for considering how we might prepare for the future. For example, the number of school places or hospitals we will need or how many people might be claiming state pensions.

What we can learn from the past is that the actual future size and structure of the population is likely to be determined by how a combination of factors affect the fundamental components of population change. These include economic performance, health and well-being, household dynamics and finances, the potential impact of conflict, cultural change, social developments, and political and policy responses to these factors or interventions that affect them. And they are by no means limited to changes and shocks that take place within the UK, as events in other parts of the world can have implications far beyond national boundaries and can lead to new population structures and patterns of migration.

In 2010 and 2011, for example, a series of popular uprisings took hold across North Africa and the Middle East. Commonly known as the "Arab Spring", they triggered different responses in different countries. In Syria, the years that followed have resulted in an enormous displacement of people. Migration flows into neighbouring countries such as Turkey and Lebanon, which continue to host at least two-thirds of the 6.7 million refugees displaced from Syria (based on UN High Commissioner for Refugees estimates of the situation by the end of 2018), were followed by secondary onward migration flows into Europe. The responses to this humanitarian emergency across Europe included the welcoming of refugees in some countries and the shutting of borders in others. In the UK, they included the resettlement of 20,000 Syrian refugees. But perhaps more relevant to future UK demographic change, the events that were unfolding happened at a time of growing public debate as the country headed towards the 2016 referendum on the UK's membership of the EU.

The UK is now withdrawing from the EU, and there is a transition period until the end of 2020 while the UK and EU negotiate additional arrangements. Current rules on trade, travel and business for the UK and EU will continue to apply during the [transition period](#). Leaving the EU will lead to changes in our arrangements with our European neighbours, including the end of freedom of movement for European citizens coming to the UK and for UK citizens going to Europe. The actual impact as it unfolds over time, both domestically and internationally, has the potential to affect our economy and society, therefore having an impact on our demography. Those impacts include our attractiveness to migrants or those already in the country and potentially impacts on birth rates and even mortality rates. It is impossible to predict these with any certainty but as they emerge, they will affect our projections of the future size and shape of the population.

This article has looked at how changes in births, deaths and migration have shaped the population structure of the UK over time. We have seen how demographic change has been influenced by events of the time and their subsequent impact. Currently, we do not know what the impact of the coronavirus (COVID-19) pandemic will be on our population. In the long term, and more systemically, we also do not know what the impact of climate change might be. Climate change is already having a major impact in certain parts of the world and is likely to have more of an impact on our lives over time. It has the potential to impact the functioning of economies and societies and to cause difficulties or conflicts over flooding and access to resources, such as clean water, land, energy and food supplies. Such outcomes will lead to population pressures and further displacements. [Climate change](#) is already generating major new migration flows across the globe. How the world responds to such events will affect the lives of both current and future generations.