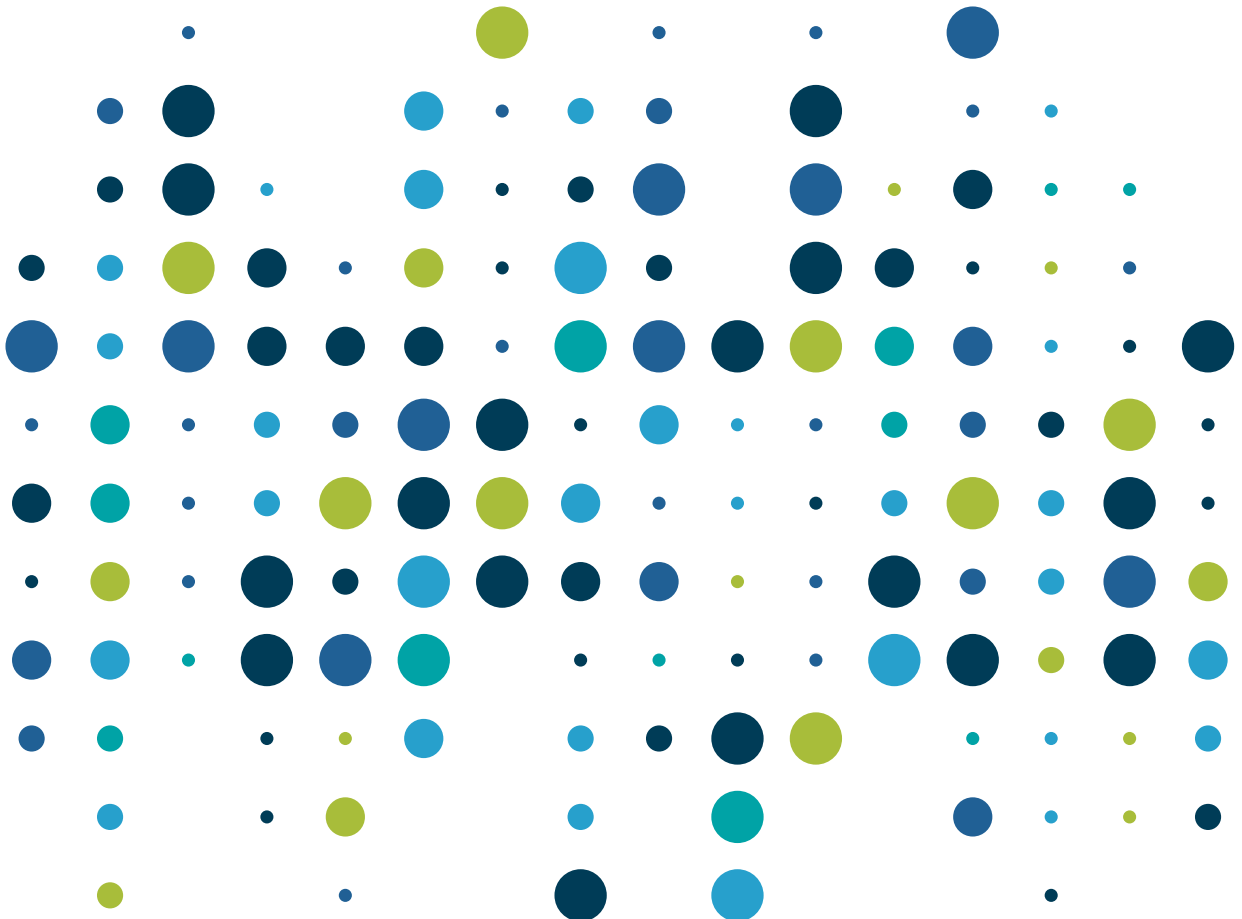Office for
National Statistics

The future of population and migration statistics in England and Wales

A consultation on ONS proposals

29 June 2023

Contents

Foreword from the National Statistician

Improving our population and migration statistics for the public good

The policy challenges of the past three years have demonstrated the indisputable value of statistics, data and analysis to informing the most important decisions we face as a country.

Since 1801, a crucial part of the evidence base for national decision-making has been the census, which has taken place to count the population of England and Wales almost every decade. Over time, questions have evolved to capture the issues of the day, as have methods: in 2001 we moved from straightforward counts of the population to sophisticated estimates produced with an additional Census Coverage Survey. More recently, we have used data from across the public sector to support our census operation, and made our census online-first in 2021.

In 2014, the UK Government set out its ambition that "censuses after 2021 will be conducted using other sources of data and providing more timely statistical information".[1] In 2018, my predecessor committed to responding to this ambition with a recommendation in light of the progress made.[2]

Driven by this goal, the Office for National Statistics (ONS) has led a programme of research to improve our population and migration statistics by further expanding the range of data sources we use. We have shown that we can produce improved population estimates, and that we have developed methods for producing information about the population more often and more quickly. These methods build on significant advances in data science and computing capability, and will offer yet more insight into our rapidly changing society as administrative data reach their full potential over the next decade.

I believe the wealth of data available from across the public sector[3] must be used to improve lives, while continuing to meet high standards in data protection, security and ethics.

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1 Government's response to the National Statistician's recommendation

2 Census 2021 White Paper 'Help Shape Our Future'

3 Administrative and health data, such as incidences of interactions with the benefits system or the health service.

Greater use of administrative data is a major theme in our five-year strategy 'Statistics for the Public Good' and we are not alone: the recent National Data Strategy calls for a joined-up approach to data across the public sector.

Our society needs a flexible, inclusive statistical system for the 21st century, one that maintains a stable level of accuracy over time and is fit for purpose in responding to unexpected change in a timely way. Based on our work to date and the capability we can prove, we can move beyond the decade-long cycle of population statistics that has dominated for centuries and deliver to meet this need.

In its response to the pandemic and the rising cost of living, our Government Statistical Service has excelled. We have used the information available to us to deliver vitally important evidence to decision-makers in record time. In many cases this has been achieved through one-off sharing of public sector data to meet priority needs. But I believe such excellent work should not be ad-hoc or one-off: the exemplary work we statisticians and researchers have performed in recent history shows us the potential benefits of accelerating the rate of change.

I want to use this momentum in showcasing the ONS's vision for a transformed statistics system that can support the needs of statisticians and data users in the decades to come. We are part of an international trend of developed countries investigating the use of public sector data in all kinds of statistics.

Of course, we cannot rely on administrative data alone, and surveys may play an important role in our future. But we have reached a point where a serious question can be asked about the role the census plays in our statistical system.

Research will continue in the years to come, but I am already hugely proud of the work our statisticians have done so far, and I am thrilled to share the progress they have made. This consultation document sets out our vision in detail, and I welcome your views on the priorities for the future of population and migration statistics, so that they can best meet your needs over the coming years. This will set a new benchmark from which these statistics can continue to evolve into the future.

Professor Sir Ian Diamond
National Statistician
June 2023

Executive summary

Putting administrative data at the core of population statistics

The ONS's vision is to improve its statistics so that they can respond more effectively to society's rapidly changing needs.

This consultation document explains the ONS's proposals to create a sustainable system for producing essential, up-to-date statistics about the population. To do this, the system would primarily use administrative data like tax, benefit and border data, complemented by survey data and a wider range of data sources. This could radically improve the statistics that the ONS produces each year and could replace the current reliance on, and need for, a census every ten years.

This consultation is seeking views on how these proposals meet the needs of users of ONS statistics compared to a census-based system.

Producing high-quality, timely population statistics is essential to ensure people get the services and support they need, both within their communities and nationwide. Population statistics provide evidence for policies and public services, as well as helping businesses and investors to deliver economic growth across the country. It is important that these statistics are up to date and reliable, so that they can accurately reflect the needs of everyone in society.

Currently, the census provides the backbone of these statistics, offering a rich picture of our society at national and local levels every ten years. Every year, the ONS complements census data with survey and administrative data to reflect changes in society. As a result of this approach, statistics become less accurate over the ten years between censuses and local detail on important topics becomes increasingly out of date.

In 2014, the UK Government set out its ambition that "censuses after 2021 will be conducted using other sources of data and providing more timely statistical information".[4] In 2018, the ONS committed to responding to this ambition with a recommendation to Government in light of the progress made.[5]

Driven by this goal, the Office for National Statistics (ONS) has led a programme of research to improve its population and migration statistics by further expanding the range of data sources it uses. It has shown that it can produce population estimates with a more consistent level of detail and accuracy over time, and migration estimates based on observed travel patterns rather than

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4 Government's response to the National Statistician's recommendation
5 Census 2021 White Paper 'Help Shape Our Future'

respondents' stated intentions, using administrative data to respond to the difficulties of estimating internal and international migration. The ONS has also developed methods for producing information about the population more often and more quickly. These methods will offer insights into our rapidly changing society as administrative data reach their full potential over the next decade.

If implemented, the proposed system would respond more effectively to society's changing needs by giving users high-quality population statistics each year. It would also offer new and additional insights into the changes and movement of our population across different seasons or times of day. For many topics, it would provide much more local information not just once a decade but every year, exploring them in new detail and covering areas not recorded by the census, such as income.

These are ambitious changes and there are challenges the ONS will need to overcome before it can fully realise its vision. This document outlines these risks and explains the ONS's plans for managing them.

The consultation questionnaire:

- asks for users' views on whether the proposals set out in this document meet their needs for population, migration and social statistics
- asks what other needs or research questions users have that these proposals do not meet
- provides an opportunity to add any other comments on the proposals

Responses to this consultation will inform a recommendation from the UK Statistics Authority, on the advice of the National Statistician. This recommendation will detail how the ONS should produce statistics about the population in future. Responses to this recommendation are expected from Ministers in the UK and Welsh Governments, with the decision whether to call a census in England and Wales resting with the UK Government, as set out in the Census Act 1920.

The decision on the recommendation will set the direction for the ONS's work programme over the coming years, as the ONS continues to improve its population and migration statistics.

You are invited to respond to the consultation questionnaire before its closing date of Thursday 26 October 2023. You can complete the consultation questionnaire online or at the end of this document. The consultation document and questionnaire are also available physically and in large print on request.

Enquiries can be addressed to **2023consultation@ons.gov.uk**, ONS Customer Services on **01329 444 972**, or by post at:

ONS Consultations Team
Post Room
Office for National Statistics
Segensworth Road
Fareham PO15 5RR

The ONS's proposals for population and social statistics

This section explains the need for population and social statistics. It also shows how the ONS plans to improve these outputs across the next ten years, compared with the current statistical system. Section 3 covers these proposals in more detail. Section 4 describes how the ONS would deliver the outputs.

2.1 How are population and social statistics used?

In our daily lives we all rely on important services. Decision-makers use population and migration statistics to plan and allocate resources for these services effectively. Population and migration statistics describe the number of people living in different parts of the country and how this changes over time. Decision-makers need up-to-date information about the size of the population and the different people who make it up. They also need a flexible understanding of how people's movements and lives change across days, months and seasons. This helps decision-makers plan services to meet changing needs, from waste collection to the availability of green spaces.

The types of services a community needs depend on the types of people who live and work there. Understanding how things like income and health can vary based on characteristics like ethnic group and disability can help decision-makers assess and address disparities. It also means they are able to meet the statutory Public Sector Equality Duty under the Equality Act 2010.

Statistics about housing and households describe how and where people live. These are crucial when planning support for households and families, including the important local and emergency services they will use. An understanding of the housing people occupy and who these people are can help to show the levels of support each household may need.

People who use the ONS's statistics find a huge benefit in understanding how different life events affect different people. For example, analysis of outcomes over time can help them to understand social mobility or the outcomes for children with experience of care. This helps to give decision-makers a detailed understanding of the drivers and outcomes of disparities and determine how their policies impact on people's lives.

2.2 How can the ONS improve how it meets these needs in future?

The use of census data in the current statistical system allows the ONS to produce detailed, accurate estimates about the size of the population and the range of population characteristics[6] once every ten years. However, in the years between censuses, the level of certainty in population estimates decreases over time. For more detail about this, see Section 3.1. Because of this, the ONS cannot produce regular statistics about many characteristics below regional level, if at all.

The ONS is proposing to use administrative data alongside a wider range of data sources to produce up-to-date statistics more often. This will mean that the ONS's statistics will be more consistently accurate. The term "administrative data" refers to information that people share for administrative or operational purposes, like information provided to the tax, benefits, health and education systems.

2.3 A summary of the ONS's proposals

Here's a summary of what's included in the proposals.

Improved population statistics

The ONS wants to produce improved population statistics, releasing them more quickly than they are currently. These statistics would also be adapted to count the population over different periods of time. Section 3.1 shows how these statistics can sustain a better level of quality every year than the ONS's existing statistics.

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6 In the most recent census, these included veteran status, ethnic group, national identity, language, religion (voluntary question), Welsh language ability, occupation, housing, sexual orientation (voluntary question), gender identity (voluntary question), education, health, disability and unpaid care.

Estimates of how and where we live and the make-up of our communities

The ONS wants to release estimates of how and where we live and the make-up of our communities more often and more quickly than is currently possible. Sections 3.2 and 3.3.1 show how this would be possible using administrative data.

Estimates comparing different attributes at a local level

The ONS wants to release estimates that allow people to compare different attributes in the population at a local level more often than is currently possible. Section 3.3.3 shows the ONS's early research about how administrative data could do this.

Analysis of outcomes over time

The ONS wants to release broader analysis of outcomes over time. Section 3.4 shows how the ONS is using the Refugee Integration Outcomes Cohort Study to do this. It also shows the ONS's high-level design to broaden these techniques by producing a Longitudinal Population Dataset.

So far, the ONS's research has concentrated mainly on what the ONS can achieve with administrative data alone. While these data do not answer all questions at present, the ONS will work in partnership with others to improve their range and quality over time. Surveys will also have an important part to play in the proposed statistical system. Section 4 describes this in greater depth.

Section 3 now considers in more detail the proposals the ONS is making. A full comparison of how outputs could change is available in Annex C.

The ONS's proposals in detail

The ONS's vision is to improve its statistics so that they are more responsive to the increasingly rapid changes we are seeing in our society. This would support the delivery of the best possible public services and better inform users of all kinds in the private and voluntary sectors.

The consultation questionnaire asks whether these proposals meet your needs, and what needs they do not meet.

Across the ONS's official statistics there is a balance to be struck between different measures of quality, which include frequency, timeliness, accuracy, geography, and detail. This balance is driven by user needs, but also often depends on the sources and methods available. An objective of this consultation is to enable users to influence the ONS's priorities and ambitions to achieve the best balance across these quality measures for different types of statistics.

Measures of Quality

Five main concepts to consider in the quality of population and social statistics are:

frequency – how often statistics are published

timeliness – how soon statistics are published after the date they describe

accuracy – how close statistics are to true values

geography – how detailed statistics are, in terms of geographical coverage

detail – the detail of classifications available in statistics (for example whether 'age' can be broken down into single years or age bands, or ethnicity classifications into broad groups or more detailed ethnicities)

3.1 Improved population and migration statistics

The ONS produces regular estimates about the numbers of people in England and Wales, and in local areas within it, by age and sex.

Through the census, population estimates can be produced once a decade down to 'Output Area' level, which cover very local areas of around 100 to 625 people. From these very small building blocks, statistics can be put together for larger geographies such as wards, local authority areas or regions, and ultimately for the whole of England and Wales.

Outside of the census, the ONS publishes annual mid-year estimates (MYEs) at the local authority level, around 12 months after the date to which they refer. For example, MYEs referring to the population in June 2020 were published in June 2021. MYEs are also typically published for smaller geographies, including at the 'Lower-Layer Super Output Area' (LSOA)[7] level of around 1,000 to 3,000 people, 15 months after the date to which they refer.

MYEs are based on 'rolled-forward' census estimates[8], combined with data on births, deaths and migration. The accuracy and reliability of the MYEs is high immediately after each census before declining over the course of the decade until they are rebased after the following census, with this cycle repeating every ten years. The quality can diminish because of the challenges of estimating international migration, an important contributor to population statistics. The ONS's estimates of international migration are now published using administrative data from the Home Office about actual observed movements, rather than intentions gathered from survey respondents. Administrative data also provide the opportunity to improve estimates of internal migration, for example using more timely information on moves of university students between term-time and non-term-time addresses.

The ONS's research indicates that it can produce reliable admin-based population and migration estimates that have a more consistent level of quality over the ten-year period than current mid-year estimates.

These admin-based estimates employ innovative techniques in a Dynamic Population Model (DPM) to produce a reliable estimate from a range of data sources. Crucially, this includes information about the size of the population calculated separately each year, rather than simply 'rolling forward' from previous estimates (see Section 4.3 for detail). The ONS expects that using this approach would mean that levels of uncertainty in population estimates would remain more stable over time, compared to the current approach where uncertainty builds up in MYEs across the decade. The DPM and the methods it applies are outlined in greater detail in Section 4 and on the ONS website. If you'd like to read more, please see the following technical box.

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7 See glossary in Annex B
8 See glossary in Annex B

Interpreting uncertainty for MYEs compared with DPM estimates

Census- and DPM-based estimates of uncertainty cannot be directly compared owing to fundamental differences in how estimates are produced. Each has their own advantages and drawbacks.

The method for producing MYE uncertainty intervals involves 'rolling forward' the uncertainty year-on-year. For example, the uncertainty present in 2011 estimates is rolled forward into the estimate for 2012. As a result, uncertainty is cumulative in MYEs, and will therefore increase over time, as can be seen in Figure 1.

Figure 1: MYE uncertainty is cumulative and increases across the decade

Average uncertainty for MYEs at local authority level across England and Wales, 2011 to 2020
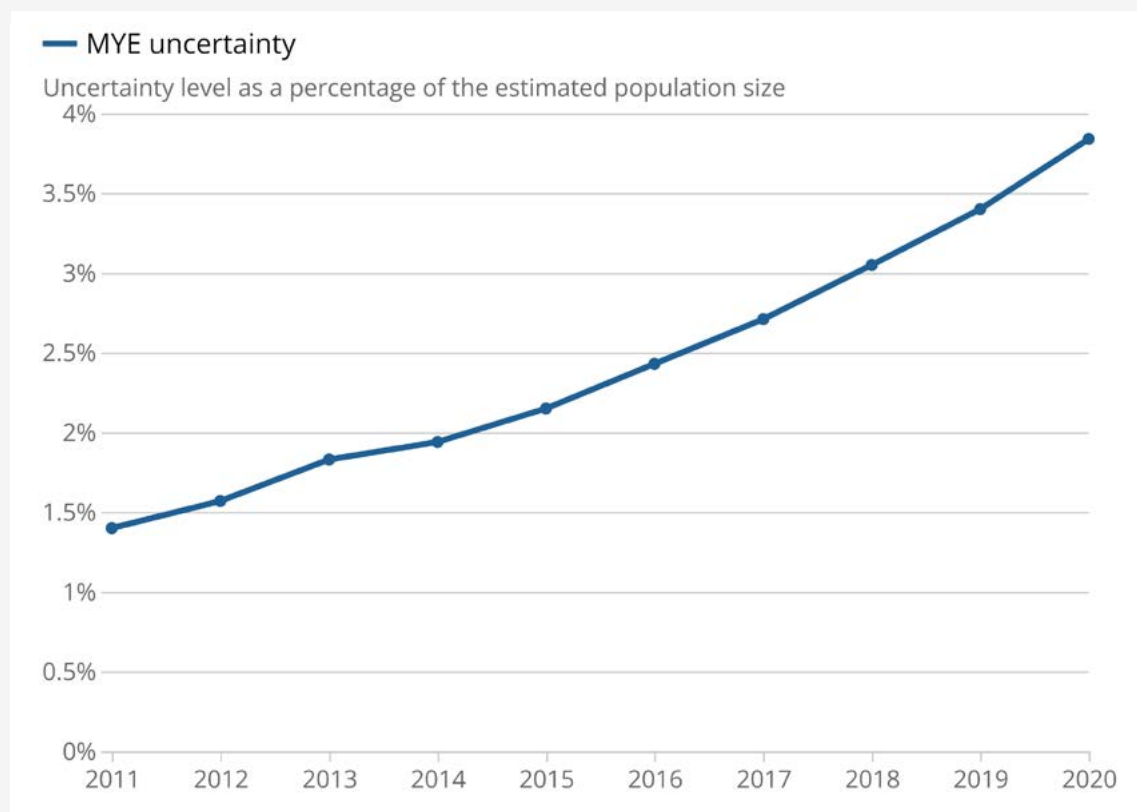
Source: Office for National Statistics

MYE uncertainty levels are reset with each new census, meaning the level of uncertainty would not continue to rise. 2021 MYE uncertainty data are not yet available, but 2021 census data put the average uncertainty at local authority level in England and Wales at plus or minus 1.26 percent (a similar level of uncertainty as in 2011).

Population size is estimated differently using the DPM method. Uncertainty in DPM estimates predominantly reflects the uncertainty present in stocks data at a given point in time. Consequently, DPM uncertainty is not cumulative in the same way as MYE uncertainty, as shown at Figure 2.

Figure 2: DPM uncertainty is broadly stable across the decade, increasing slightly with provisional estimates

Average uncertainty for DPM estimates at local authority level across England and Wales, 2011 to 2022
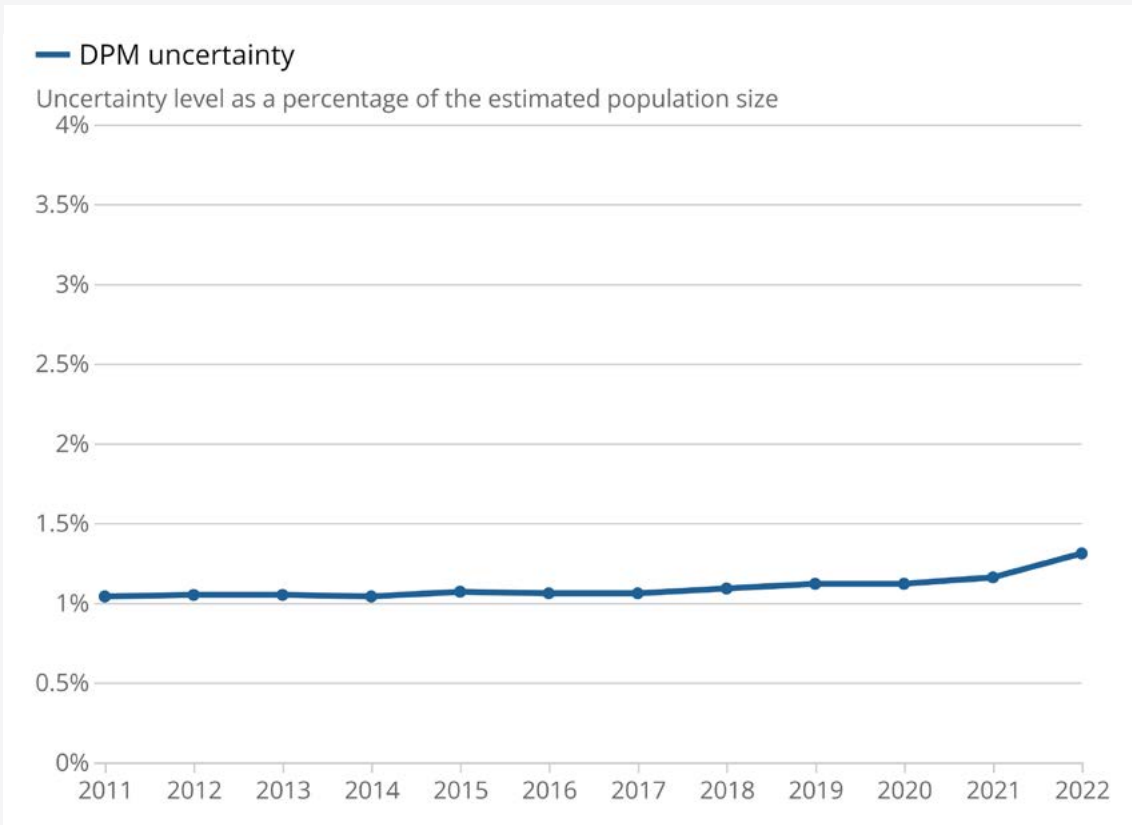
Source: Office for National Statistics

The greater stability of DPM uncertainty over time is a strength of the method. The ONS is still developing how it produces DPM uncertainty for local authorities; this method is only approximate and probably underestimates DPM uncertainty. In addition, DPM uncertainty is lower because of the way the methodology provides a smooth time series, borrowing strength across time as well as different data sources. Further information on the method for producing DPM uncertainty can be found on the ONS website.

Figure 2 also shows increased DPM uncertainty in 2022. The increase in uncertainty reflects the fact the 2022 DPM estimate is a provisional estimate and produced without full data, but only six months after the reference point.

It is also important to note that Figure 2 shows uncertainty calculated using data from the Census 2021-based MYE to adjust for any under-coverage or over-coverage in the admin-based stock data. Its resultant high quality reduces the bias and makes the population estimates more reliable, reducing the uncertainty.

The DPM will use the Census 2021-based coverage adjustment for the next few years, as it will be the highest quality data source available for this purpose. However, around the decade mid-point, Census 2021 data will begin to decrease in quality (as set out above and shown at Figure 1). The ONS has outlined its approach for future, more sustainable coverage adjustment options. In the future, with a different coverage adjustment data source, the pattern of uncertainty may differ from that shown at Figure 2, with a reduced difference between MYE and DPM uncertainty. Nonetheless, the uncertainty of DPM estimates should continue to be stable over time.

Using the DPM, the ONS proposes to produce more flexible annual population statistics. In keeping with ONS's economic statistics, these estimates would be published as:

- more timely provisional population estimates much closer to the date being described (i.e. estimates about the year to mid-2024 provided in December 2024); followed by
- more reliable updated estimates provided within 12 months when more data are available[9].

These population statistics would be provided at the local authority level alongside improved international and internal migration estimates that also have administrative data at their core. The ONS has started researching the [viability of producing population estimates at the LSOA level](#).

As the DPM is refined further, the ONS will also explore the feasibility of producing population estimates for smaller geographical areas from the DPM, including the Output Area level[10], within the next several years. Over time, this new system would therefore produce population estimates that strike more of a balance between the measures of quality than existing outputs. It would deliver population statistics that are more accurate over the decade and cover national and small area populations. It would also be better able to incorporate population changes as they occur with more timely provisional estimates giving insights soon after the date to which they refer.

3.1.1 Estimating alternative populations

The ONS currently produces population statistics that meet the [United Nations (UN) definition for usual residence and long-term international migration](#). These definitions refer to people residing in the country for 12 months or more, including those who either move to the country or depart for that period of time. Statistics that meet these definitions will continue to be produced.

Additionally, in response to the dynamic population changes seen in today's society, the ONS is exploring the use of administrative data to measure temporary resident populations and a diverse range of migration patterns. For example, seasonal migrants, or migrants who move into and out of areas, such as students, whether they are moving internationally or from one part of the country to another.

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9 Provisional estimates use a limited set of data, which is sometimes incomplete, alongside some assumptions about migration. Updated estimates include additional data that have become available and refined assumptions about migration

10 See glossary in Annex B

This is a complex area that can now be explored better because of opportunities available through the use of administrative data. For example, the ONS is investigating how travel and visa information will enable more flexibility in responding to requests for international migration estimates over a specific period. The publication Population and migration estimates: exploring alternative definitions describes alternative migration and population definitions, including examples of ongoing work, as well as asking for users' suggestions for useful and impactful outputs.

Work in this area is helping the ONS to consider the information it can provide about the 'population present' over a given period. It can reflect much shorter stays in an area: for example, seasonal population change including seasonal work and tourism, the use of second homes, how weekday populations compare with weekends, or how daytime compares to evening or night-time populations. Understanding the 'population present' would better inform provision of local services such as waste collection in city centres or planning for healthcare in tourist destinations.

ONS research has already demonstrated the potential to estimate small-area 'population present' by time of day, using modelled administrative data alongside anonymised and aggregated mobile phone crowd movement data. Figure 3 shows, for Swansea, a comparison between (i) mid-year population estimates, which represent the population at its usual overnight residence, and (ii) the population at 2pm on a weekday using modelled administrative data. It shows a clear pattern of movement from residential areas to non-residential areas such as the marina (53% increase) and city centre (267% increase). The largest difference can be seen in the west of Swansea city in an area that contains a university campus and hospital (1,568% increase). While these experimental statistics currently exclude some key sub-populations and types of population mobility necessary to produce accurate estimates of 'population present', for example tourists and rail travel, they mark the first time that mobile phone data have been used by ONS for daytime population statistics.

Figure 3: Daytime population estimates show a significantly larger population for Swansea city centre than MYEs

Percentage difference between daytime population estimates and MYEs, by LSOA in Swansea, 2019
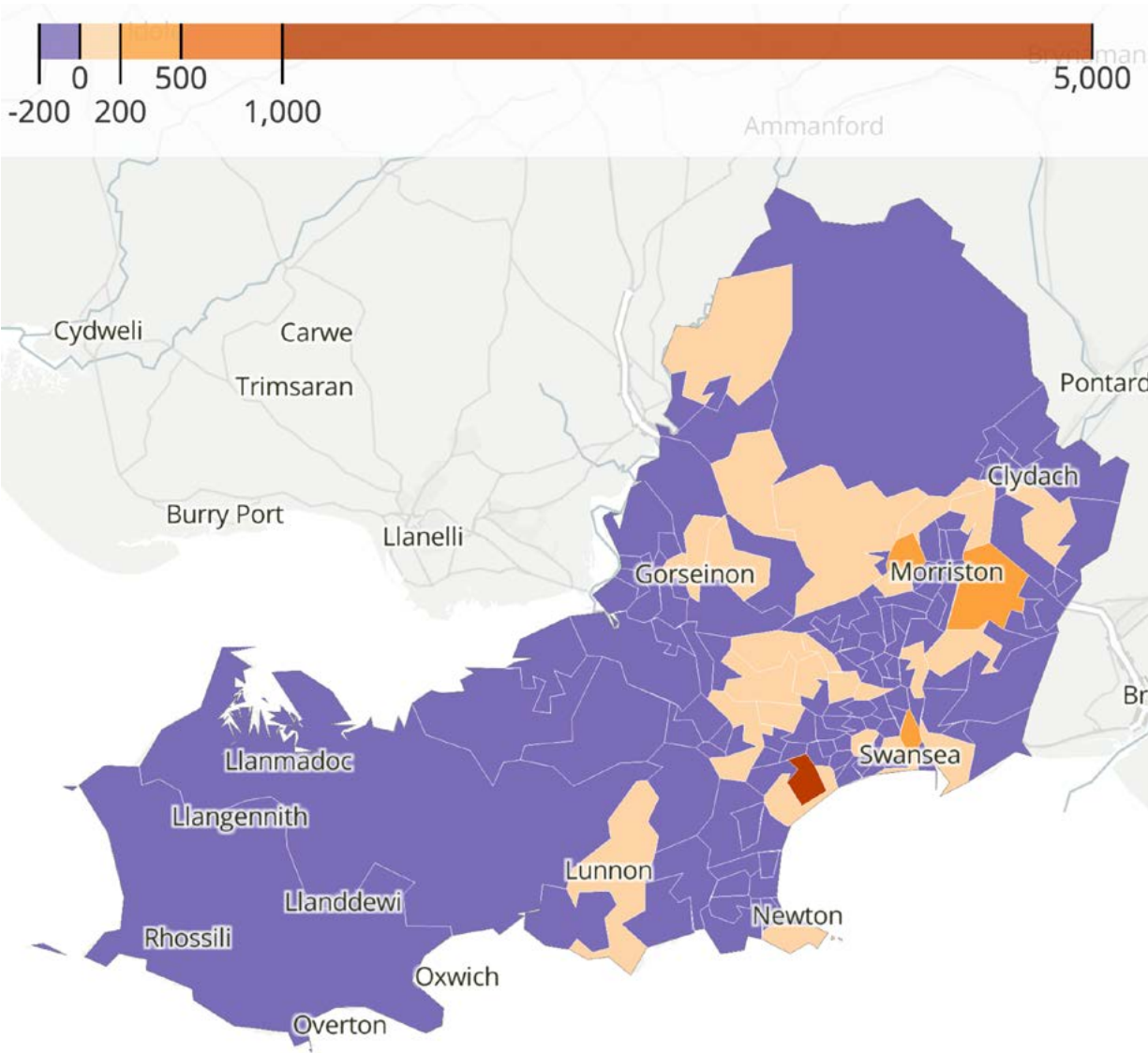
Note (Figure 3): Positive differences show the daytime population estimate is larger than MYEs, negative differences show the daytime population estimate is smaller.

The consultation questionnaire asks about user needs for data on the 'population present' for different reference periods.

3.2 Household estimates

The census provides household estimates down to small areas with an 18-month lag every ten years. In the years between censuses the ONS publishes annual estimates of the number and composition of households and families, including for the UK, its constituent nations and the regions of England. These estimates are produced from the Labour Force Survey and provide information about trends in the number and type of households and families, with and without dependent children, people living alone and people in shared accommodation, broken down by size and type of household.

The ONS currently uses a definition of a household as one person living alone or a group of people living at the same address, whether or not they are related, who share cooking facilities and share a living room, sitting room or dining area. A household can therefore consist of a person living alone, a single family, more than one family or no families in the case of a group of unrelated people.

Administrative data cluster individuals into addresses and can report on the characteristics of the people living in those addresses. These occupied addresses provide a close representation of households and many countries who have a register-based approach to producing census-type statistics (see Section 4.7) use household, address and dwelling definitions interchangeably.

In some cases, there will be a difference between the two approaches, for example where there are multiple households at an address. Less than 1% of addresses responding to Census 2021 contained more than one household, so occupied addresses equate to a household in more than 99% of cases.

Figure 4 compares our admin-based statistics for occupied addresses with census-based household estimates. It shows that occupied addresses with one or two residents were the most common amongst occupied addresses across England and Wales in 2021. Similarly, households with one or two residents were the most common household formation recorded on Census Day in 2021. The minor differences between the data sets can be explained by under-coverage of the population relative to the census in the administrative dataset. This is because some properties were grouped together due to similar addresses and a lack of estimation methodology. To address these issues, the ONS will develop an estimation methodology and improve the quality of the address information and methods for grouping individuals into addresses.

Figure 4: Occupied address and census household statistics show limited differences at national level

Comparison of admin-based occupied address data (ABOAD) with census household data, England and Wales, 2021
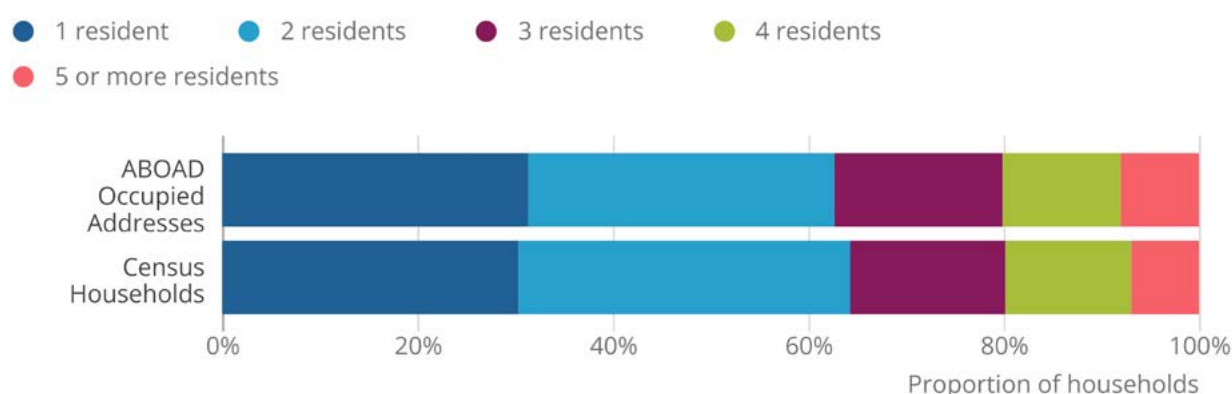
Source: Office for National Statistics

Previous discussions with users on the definition of a household have highlighted both advantages and disadvantages with an address-based definition. The ONS's research programme will explore modelling techniques to provide estimates consistent with the household definition above, alongside address-based statistics. The ONS will also build on existing knowledge to more fully understand the types of people affected by using an address, rather than household, definition.

It is already possible to describe the age and sex of people at an address which can provide insights into inter-generational households. The ONS will explore how it can use familial and household relationships in administrative and survey data as well as modelling to go further to produce estimates that more closely match the census household definition.

In addition, the ONS will explore how to combine the administrative data sources used to produce a total usually resident population by household type (see Section 4.3) with specific sources about residents in communal establishments such as care homes, student halls and prisons. This will enable it to produce estimates of the size of the population living in these and other non-household settings.

3.3 Characteristics of the population and housing

In addition to estimates of population size and of households, the ONS produces a range of information about the characteristics of the population, such as ethnic group, and housing, for example property type.

Every ten years, the census provides very detailed estimates according to a single characteristic, for example numbers identifying with each ethnic group. It also allows the ONS to show two or more different characteristics together, for example the educational or health outcomes for people of different ethnic groups. Census 2021 has produced around five billion data points across its outputs against these different characteristics, which can be explored through the ONS's 'create a custom dataset' functionality. These data are, however, only available once every decade. Maintaining the current model for population and social statistics would mean the next available local data would be available in 2033.

In the years between censuses the ONS collects some of these characteristics in surveys, allowing estimates to be produced to the regional level and, in a small number of cases, at smaller geographies. This limited granularity affects the ONS's ability to provide strong evidence for decision-makers about a range of important population attributes, including protected characteristics[11], in the years between censuses.

Ensuring data are available across relevant groups and populations at differing levels of geography was one of the key principles to improve inclusivity in data and statistics developed by a panel of independent experts. The ONS is committed to enhancing inclusivity, as shown in its annual report on progress which was published in May 2023. Making greater use of administrative data to provide more frequent and timely statistics is part of the ONS's work to improve inclusivity.

By making greater use of administrative data alongside surveys, the ONS could provide more frequent and timely statistics for most characteristics at the local authority level and below that provide a predictable and stable level of detail across the decade. Using these data where they are available can help to target surveys better and produce increasingly detailed estimates.

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11 See glossary in Annex B

Administrative data also open up possibilities for more detailed and insightful analysis by providing more consistent, objective or technical information than a self-completed questionnaire, for example on health and disability, or more detailed or complete information than can be gathered in the limited space of a census form, for example in education. Drawing on a wider range of sources also has the potential to improve composite indicators such as socio-economic status.

What this means will vary across the wide range of characteristics and topic areas, as set out in the following sections.

3.3.1 Single characteristics

As discussed, some of the ONS's estimates describe a single characteristic, for example the numbers of veterans in different parts of the country. The ONS's ambition is to provide this type of estimate for all topics it typically collects via a census, at a frequency and to a geographic level that reflects users' needs. It would also expand beyond the range of topics in the most recent census questionnaire to capture new subjects such as income, and remain flexible to covering new topics that users need as they emerge.

The ONS's ability to produce counts by characteristics using administrative data has already been demonstrated, including for ethnic group, income, housing, labour market status and veterans. These topics have been prioritised for research due to a combination of high user need identified in previous consultations, and their availability in administrative data sources.

The research produced to date has laid the groundwork for the production of annual admin-based estimates on an even broader range of characteristics within the next decade.

Figures 5 and 6 compare the ONS's admin-based ethnicity statistics (ABES) for Manchester and Ceredigion with census data. They show that the ABES are similar to census-based ethnicity statistics. However, there are some differences in the ABES, including higher percentages of those in the white ethnic group, and lower percentages of those in the Asian, black and other ethnic groups.

Admin-based estimates do not give complete coverage of the population. The differences described demonstrate a need to improve the coverage of the population in the data sources and collection practices used to produce these statistics, and to use methods to adjust for missingness[12] and other quality issues. Using additional sources, including surveys, could improve the ABES. Further detail can be found in the publication Population and migration statistics transformation: population characteristics update, England and Wales, 2023. Sections 4.3 and 4.4 describe how the ONS produces these estimates, and how they will be developed in the coming years.

Figure 5: Admin- and census-based ethnicity statistics show small differences at local authority level

ABES population by 5-category ethnicity, Manchester, 2021
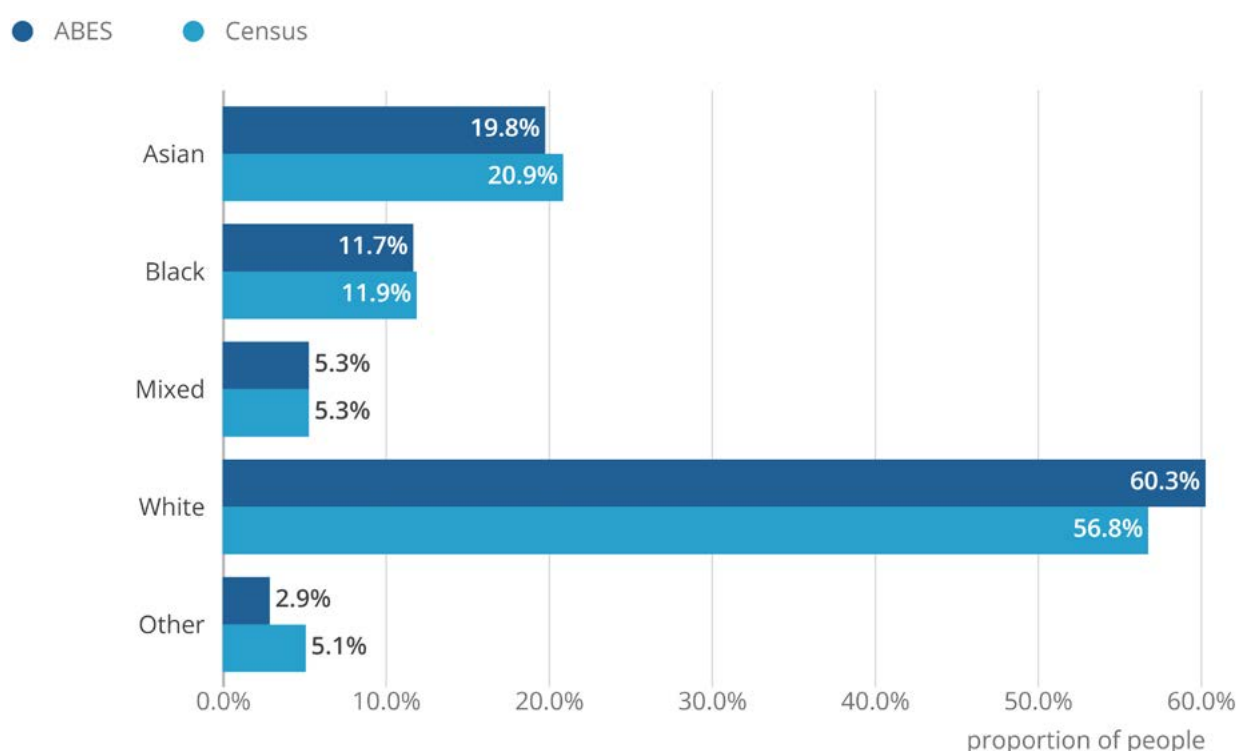
Source: Office for National Statistics

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12 See glossary in Annex B

Figure 6: Admin- and census-based ethnicity statistics show small differences at local authority level

ABES population by 5-category ethnicity, Ceredigion, 2021
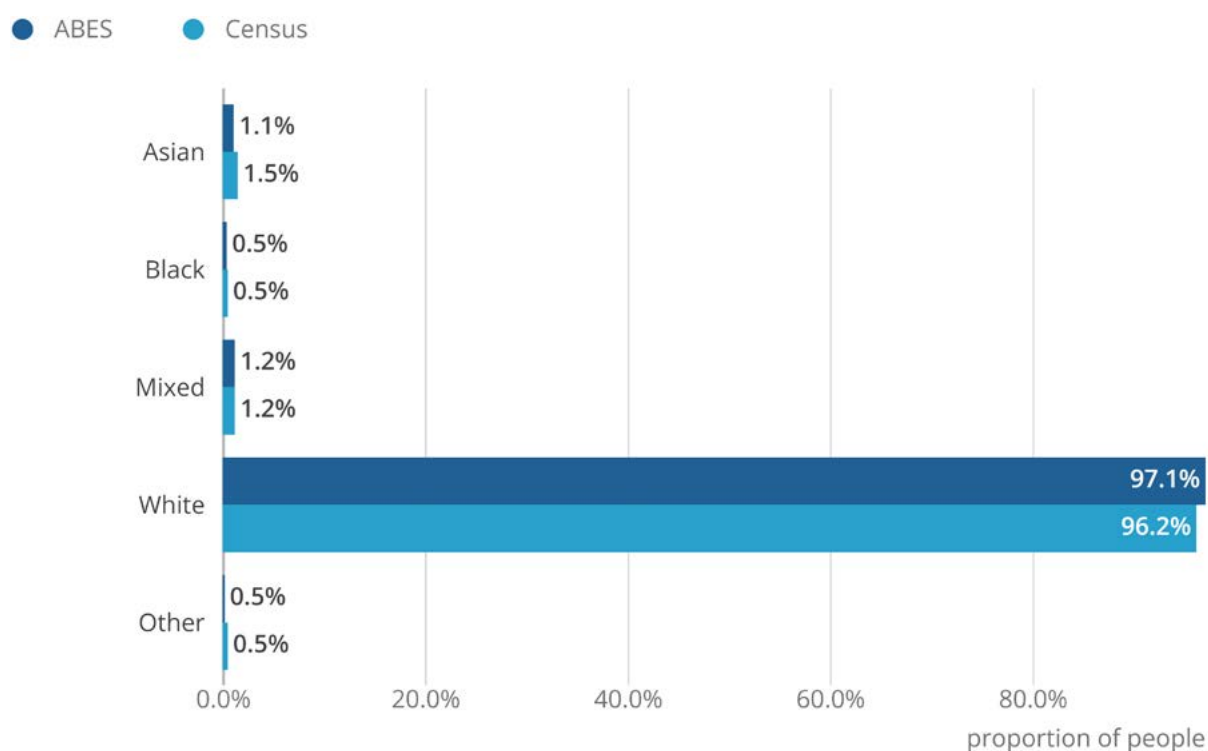
Source: Office for National Statistics

The ONS has also investigated the coherence between health-related variables from the census and measures of morbidity derived from electronic health records. This research has compared the ability of these measures to predict mortality in the population during the COVID-19 pandemic.

For more information on the ONS's ambition for other topics, see Section 3.3.3.

3.3.2 Combining two or more characteristics

Using census data, the ONS also produces statistics that present two or more different characteristics together, to help understand outcomes or life circumstances for different population groups. Using administrative data and with the appropriate application of methods, it is possible to produce this type of information much more frequently for many topics. The high coverage of the population in administrative data compared to survey data means this can be done at lower levels of geography and for smaller population groups than is currently possible through surveys alone. The ONS's ambition is for these to be updated annually where the contributing data are available to deliver this, enabling users to explore the most up-to-date data.

The ONS has demonstrated the feasibility of using administrative data as the starting point for more frequent estimates that show two or more characteristics together at the subnational level. This includes admin-based housing by ethnicity (see Figures 7 and 8) and admin-based income by ethnicity.

Figures 7 and 8 illustrate how the ONS can use administrative data to explore the types of accommodation in which people from different ethnic groups live. This is achieved through the Admin-Based Housing by Ethnicity Dataset version 2.0 (ABHED V2.0). The data are based on occupied addresses, as described in Section 3.2.

In Figure 7, the ABHED V2.0 shows that terraced houses are the most common type of accommodation for all ethnic groups in Manchester.

Figure 7: Administrative data can show the breakdown of accommodation type by ethnicity at the local authority level
Accommodation type by ethnic group, Manchester, 2021
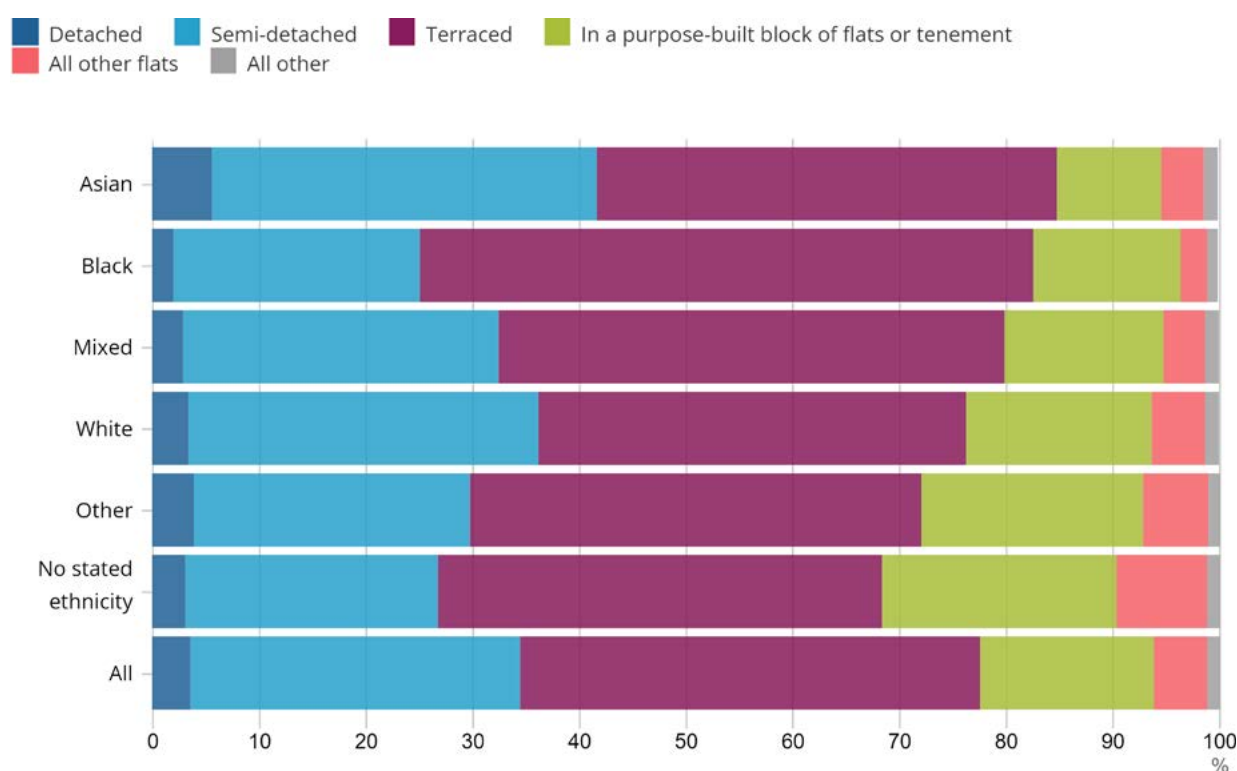
Source: Office for National Statistics

In Figure 8 the ABHED V2.0 shows that in Ceredigion, almost half of people live in detached properties. However, there are differences in the types of accommodation occupied by different ethnic groups, with individuals in the white ethnic group most likely of all ethnic groups to live in detached properties. Those in the black ethnic group were more likely than other groups to live in semi-detached houses.

The data are also based on occupied addresses, as described in Section 3.2.

Figure 8: Administrative data can show the breakdown of accommodation type by ethnicity at the LA level

Accommodation type by ethnic group, Ceredigion, 2021
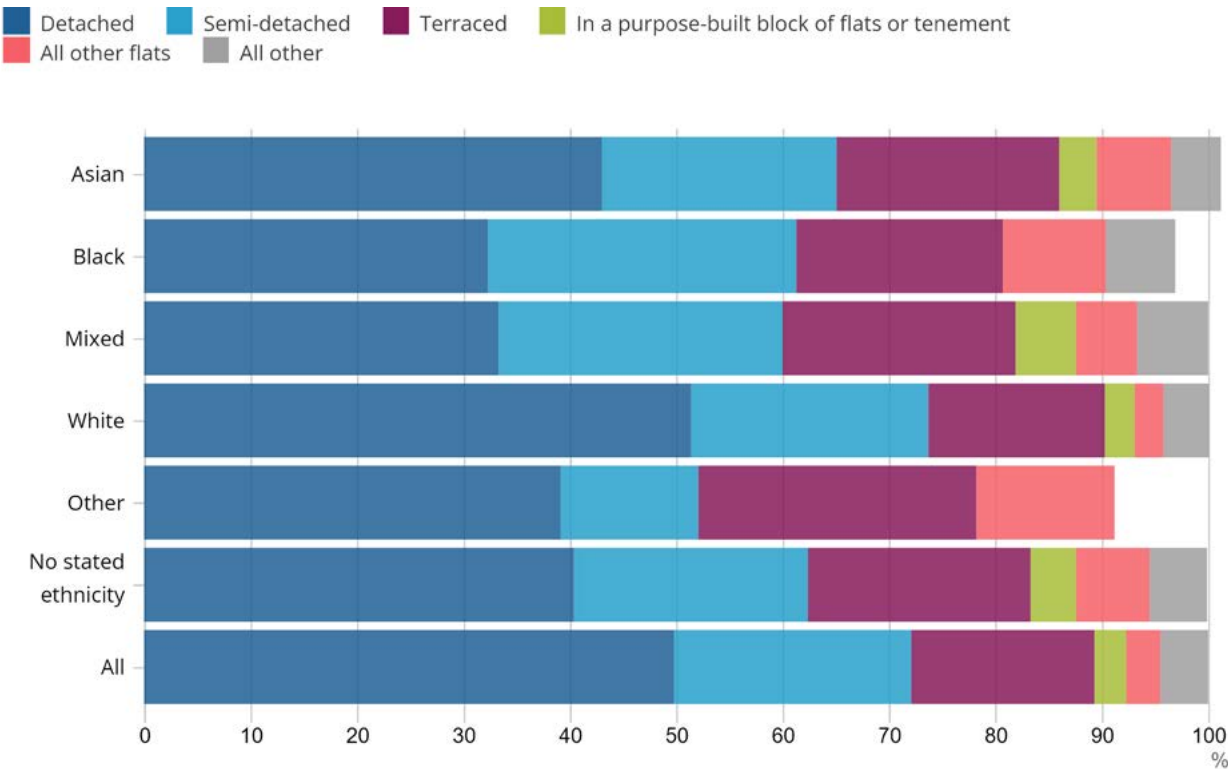
Source: Office for National Statistics

Note (Figure 8): Some categories appear under or over 100% because the figures include suppressed and rounded values. Values for some categories are suppressed when the data cannot be provided for reasons of confidentiality.

Some people do not have a stated ethnicity in administrative sources, meaning they are not fully represented in the admin-based housing by ethnicity statistics. As described in Section 3.3.1, there is a need to improve the coverage of the population in data sources used to produce these statistics, and to use methods to adjust for missingness[13] and other quality issues so that they are fully representative.

Section 4 explores how the ONS would develop from its current position to regular outputs over the next decade.

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13 See glossary in Annex B

3.3.3 Building towards comprehensive characteristics statistics

The ONS has demonstrated that administrative data can be used to produce information about a range of characteristics. So far only a fraction of the insight administrative data could provide has been realised. Working with partners across the public sector will be key to widening and developing the range of administrative data sources that are collected and used. The ONS will continue to seek to expand and strengthen its network of data suppliers in order to improve the quality and relevance of admin-based statistics it can offer.

If the proposals in this document were accepted, for many topics, surveys would continue to play a role whilst the ONS works with partners to support administrative data to reach their full potential. The extent to which survey data are needed would vary from topic to topic. Leveraging survey capability would be particularly important for topics such as country of birth, religion, Welsh language, main language, unpaid care, occupation, national identity, sexual orientation and gender identity.

Building upon the research described in the previous sections, and taking into account the availability of administrative data, the ONS's baseline objective for all topics currently covered by the census is to deliver annual statistics at the local authority level with a 12-month lag from the reference date[14]. It would also aim to expand beyond the full range of census topics.

Based on the current availability of data sources, there are some topics where the ONS can go further than the baseline, and there are others where administrative data are not currently available to meet the baseline. These differences are set out in the following section.

Topics to which the baseline objective applies

The baseline objective applies in full to labour market status, veterans, vehicle ownership, household composition, communal establishment and special populations, tenure of housing (for example rental or ownership), disability and marital and legal partnership status. From this baseline the ONS aims to build towards outputs at the more detailed Lower-Layer Super Output Area (LSOA) level[15] for these topics.

Topics with greater geographic detail than the baseline

For some topics, outputs could have similar frequency and timeliness, but with more geographic detail than the baseline, with outputs at LSOA level. This applies to the topics of age, sex, income, ethnic group, housing characteristics (excluding tenure), health and education.

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14 See glossary in Annex B

15 See glossary in Annex B

Topics with less frequency and timeliness than the baseline

For others, outputs could be less frequent than the baseline but more frequent than census estimates, at most every two years, with a longer lag of around 15 months. This applies to the topic of country of birth.

Topics for which further research is required

Further research is needed to determine the scope for more frequent and timely statistics on the topics of national identity, gender identity, the national statistics socio-economic classification (NS-SEC), occupation, religion, main language, sexual orientation, pregnancy and maternity, and caring responsibilities.

The ONS recognises the importance of Welsh language statistics to statistical users in Wales and it is working with Welsh Government to identify appropriate sources for producing these statistics in future.

The ONS welcomes feedback on users' requirements for statistics on these topics against the measures of quality listed in Section 3. The ONS's objectives for these topics will be influenced by responses to this consultation. As part of its transformation the ONS would also build in flexibility to respond to user needs for statistics on new topics, beyond those currently covered by the census, enabling it to consider producing statistics on new variables more often than once every ten years.

As demonstrated in Section 3.3.2, administrative datasets can be linked to produce outputs that bring together combinations of topics, such as ethnicity and housing. These outputs would continue to be developed, covering a wider range of topics, for example education and labour market status, and topics would be prioritised based on the needs of users. With the insight provided by combining topics, the ONS has the potential to explore societal outcomes for different population groups in a more timely way and at a more granular level, for example combining variables that feed into socio-economic classifications and measures of deprivation.

By further expanding and developing the range of administrative datasets at its disposal, ONS analysis could explore beyond individual questions in the census. For example, it could produce more detailed information about how the presence of individual health conditions can vary by other characteristics. It will also allow a prompt response to other questions of the day.

The ONS continues to research the availability of administrative sources for the topics described in this section, and their coverage. A current assessment of these sources is set out at Figure 9.

Figure 9: Research on the availability of administrative data sources and their expected coverage varies by topic

Rating of administrative data source research (from exploratory to mature) and coverage (from limited to full) for characteristics
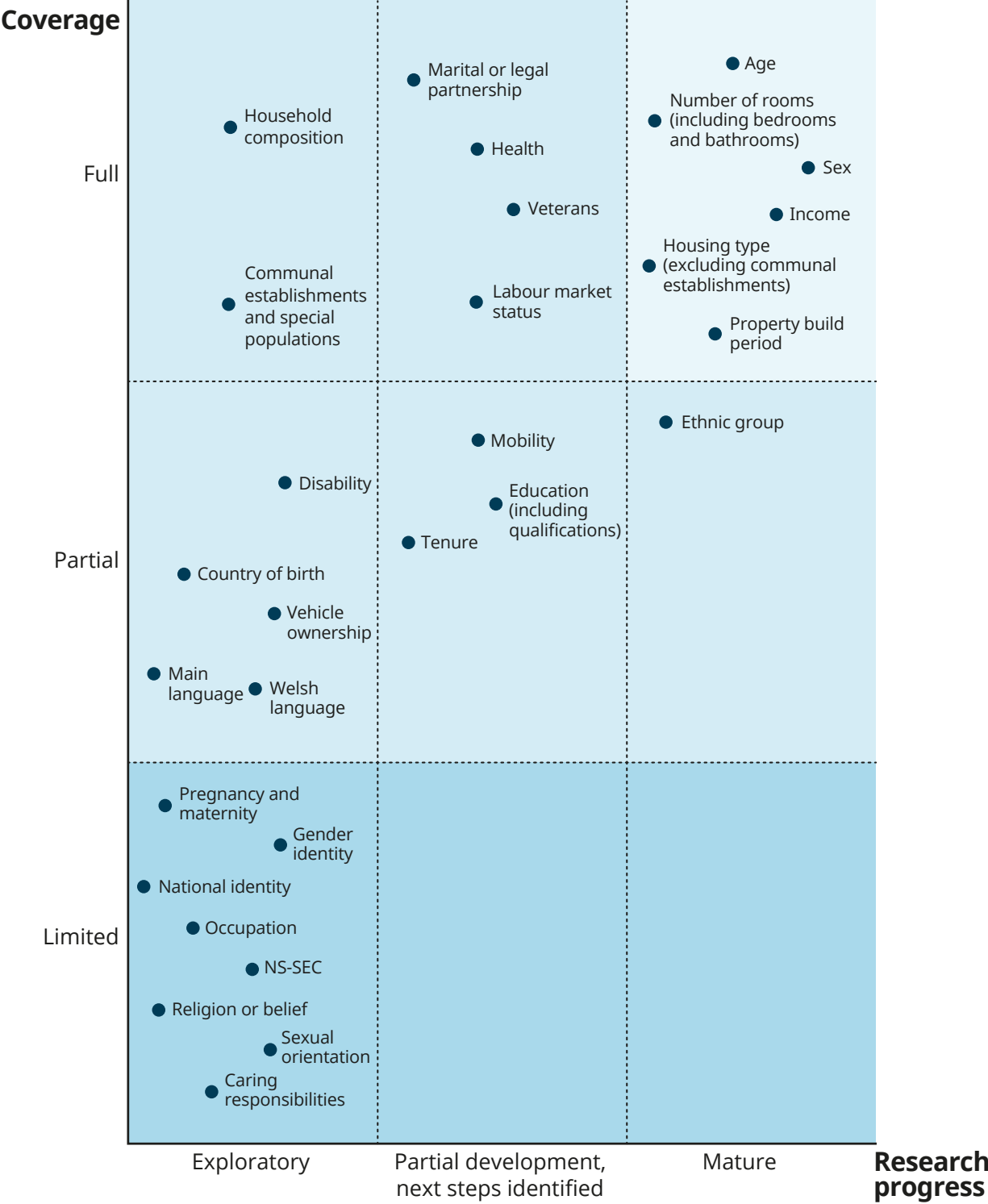
The ONS's research programme following the National Statistician's recommendation will develop fully the strategy for producing these statistics in the future. This will inform how these data could be collected, which may include new collection via administrative data sources or social surveys, and the methods that can help reach robust estimates. (See Section 4 for detail.)

Sections 3.3.1 and 3.3.2 demonstrate the feasibility of producing admin-based characteristics estimates much more frequently than can be achieved through the census, but there are limits to the detail that can be achieved for some topics using administrative data first. For example, when producing statistics on ethnic group using administrative data, it is currently possible to produce statistics across 19 ethnic groups. This is different to the census, from which it has been possible to produce statistics on 287 groups. User responses to this consultation will increase our understanding of the appropriate balance of frequency, timeliness, geography and detail of our characteristics estimates to meet users' needs. This will inform our future work to explore the viability of producing more detailed estimates with administrative data at their core, and where the use of surveys or other sources might be needed.

3.4 Research and longitudinal studies of the population

As well as being used to produce publications for users, de-identified data[16] from the census can also be accessed securely by accredited researchers and are used in the ONS's own research, where a case for the public good and ethical best practice can be shown. Both of these would continue in a transformed system. More information about data protection and research can be found in Section 4.

The existing ONS Longitudinal Study (LS) is based on a 1 percent sample of the population of England and Wales, linking census and administrative data from 1971 to the present. It has supported research across multiple themes, including ageing, care-giving, deprivation, ethnicity, health inequality, migration and social mobility. Further plans include a Longitudinal Population Dataset (LPD) which would enable longitudinal study of the whole resident population. Beginning with anonymised core data from Census 2021, updated to account for births, deaths and migration, it could be linked to other sources to enable study of the population or sub-groups. The value of a large-scale longitudinal dataset was illustrated during the coronavirus pandemic when this approach allowed an understanding of differences in COVID-19 mortality for people with different characteristics or occupations, providing information to decision-makers that could help them to protect population groups with higher risk factors.

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16 See glossary in Annex B

To demonstrate the feasibility of maintaining an LPD to deliver a range of benefits, the ONS, in collaboration with the Home Office, has created the [Refugee Integration Outcomes Cohort Study](#) (RIO). The RIO study explores integration outcomes for refugees resettled via the Vulnerable Persons and Vulnerable Children's Resettlement Schemes and refugees granted asylum in England and Wales between 2015 and 2020. It draws on linked administrative data to show integration outcomes, for example where refugees first lived in England and Wales, and how they have moved around since their arrival. It can help us to understand more about refugees' housing, such as the type of accommodation they are most likely to live in, and over- or undercrowding, by linking to Census 2021 data. Self-reporting is used to provide analysis on characteristics such as refugees' health and disability status. Further linkages are planned to understand labour market outcomes and access to benefits, as well as education and health outcomes. The ONS's vision is for the RIO Cohort Study to become integrated into the LPD, allowing comparisons between the people included in it and other population groups, for example the general migrant population.

3.5 Genealogy and social history

The ONS's role is to produce high-quality statistics that serve the public good. The principal purpose of the census has always been the creation of statistics to inform decision-making. However, the ONS is aware of the value of these data to genealogists and historical and family researchers when the responses are eventually published as historical records.

Currently, personal census information is held securely for 100 years before being made available to the public and this will continue for all censuses up to and including Census 2021[17].

In a transformed system, the ONS would be using administrative data from a range of sources as the foundation of its statistics. The ONS is engaging with partners in the UK Government and the National Archives to assess the possibilities for retaining records from statistical datasets based on administrative data in a similar way.

The ONS's proposals for a Longitudinal Population Dataset present the opportunity to retain a rich historical record of the population to support future genealogical and social research. Such records could take the form of more frequent snapshots of data by individual and address that could also be linked longitudinally. While still covering the full population, the available records would be richer in some instances than others, drawing on a range of sources that could expand over time and also respond to the topical issues of the day.

Data held for historical purposes would be stored securely and ethically, separate from any personal identifiers, until appropriate to be published as historical records.

The consultation questionnaire asks what information is important to be preserved for future researchers.

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17 This does not include the 1931 census, whose questionnaires were destroyed in a fire. No census took place in 1941 due to the Second World War.

Achieving the ONS's vision

To produce the reliable estimates that its users need, the ONS uses a range of data from different sources. As seen in Section 1, this currently revolves around the census as a very large data-collection exercise once per decade and supplemented by surveys and administrative data. In future, the system could be primarily based on administrative data, supplemented by surveys.

This admin-based system would draw strength from using many sources, more often. This would enable the ONS to produce better population statistics and to be more responsive to changes in the population and its profile. This section provides an overview of sources, methods and processes involved. More detail is available on the ONS website.

4.1 Data sources

The term "administrative data" refers to information that is collected when individuals interact with public services. In future the ONS would use select information, securely, from a variety of administrative data sources, including the tax, benefits, education and health systems[18], alongside social surveys (as described in Sections 4.3 and 4.4).

The reason the ONS can make greater use of administrative data today is the Digital Economy Act, which was passed by the UK Parliament in 2017. This Act amended the Statistics and Registration Service Act 2007, enabling different parts of the public sector to securely share administrative data with the ONS for statistics and research.

To access and use these data, the ONS enters into an agreement with the data owner, which specifies the information that will be shared and can place restrictions on how the data can be used. In each case, the ONS only seeks access to the data it needs from a given dataset. For example, information can be shared about people's interactions with the health service for population estimates, but the ONS does not receive the sensitive information about what took place during those interactions. This means that only the specific data needed to produce statistics or support research are shared with the ONS.

Where the ONS identifies ways to improve administrative data quality, it shares this information with the data supplier. In this way the ONS creates positive feedback loops to improve administrative data quality. This has benefits for the ONS, the supplier, and for other statistical users of these data.

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18 The ONS is transparent about the data it uses and what it uses it for – please consult the ONS website for the list of administrative data in scope of this work.

4.2 Data security

The ONS has a proven track record of protecting sensitive data, built over many decades of delivering the census in England and Wales and the UK's biggest regular household surveys.

The ONS complies with data protection legislation, so that when new uses of personal data are considered, it ensures the use is necessary, proportionate, and transparent before proceeding. Where potential risks are identified, the ONS also produces Data Protection Impact Assessments as necessary to understand and mitigate these risks.

Privacy and security are important not only to the ONS, but also to the trust the public has in its work. The ONS protects administrative data to the same high standards as census data: it is a legal duty to maintain confidentiality under the Statistics and Registration Service Act 2007 and the Data Protection Act 2018, and strong sanctions are in place to deter anyone from disclosing or seeking to disclose personal data. For all of the ONS's published statistics, it puts in place processes known as statistical disclosure control methods to prevent the potential identification of an individual, household or business, or attributes relating to them. This is a legal and ethical duty, a requirement of the Code of Practice for Statistics, and an international principle of good statistical practice which is followed at all times.

Alongside the statistics and analysis it produces for the public good, the ONS contributes further benefit from the data it holds by making de-identified data[19] available to accredited external researchers in a Trusted Research Environment (currently the Secure Research Service). All data that the ONS makes available to these accredited researchers are protected by the Five Safes, an internationally recognised framework for data protection that puts very strict controls upon data access, to ensure:

- Safe **data**: steps have been taken to remove individuals' identifiers
- Safe **people**: researchers are accredited to conduct research, having received mandatory training, technical skills, and understand the importance of data confidentiality
- Safe **projects**: the use of the data is appropriate, ethical and for the benefit of the public
- Safe **settings**: research takes place within a Trusted Research Environment so that data are kept safe
- Safe **outputs**: processes are in place to ensure that outputs produced from the data cannot be used to identify individuals

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19 See glossary in Annex B

4.3 Methods

To produce the range of statistics described in Section 2, the ONS has developed a system to provide both a robust base for population estimates, and the capacity to provide detailed statistics across a wide range of characteristics:

Admin-based population estimates

The ONS can produce admin-based population estimates using a Dynamic Population Model (DPM), which produces an estimate using (i) the population recorded in the Statistical Population Dataset (SPD, see the following paragraph), (ii) a regular coverage survey and (iii) information about migration from other sources. Applying modelling based on previous population trends, it produces population estimates that meet the ONS's quality standards[20], currently to the local authority level. Because it uses the frequently-updated SPD as a stock measure, it is expected that the estimates produced will be more accurate over time and less likely to repeat any bias or error in previous years' estimates than current rolled-forward MYEs.

Statistical Population Dataset

The Statistical Population Dataset (SPD) is an annual, anonymous representation of the population that is usually resident in England and Wales at the local level. It is created using administrative data from a range of sources that are frequently updated, including tax and benefits data. Similar to the population counts the ONS gets from the census, but updated annually, it provides a strong foundation or "stock measure" for producing admin-based population estimates.

Admin-based characteristics statistics

Admin-based characteristics statistics are currently produced by securely linking the SPD with de-identified information about the population's characteristics (such as ethnic group, income or housing) held in relevant administrative data sources. Doing this for one characteristic produces univariate statistics, showing how people across the country or in local areas are classified within that characteristic (for example, the ethnic group make-up of a local authority area). Combining two or more characteristics (which may be in the same dataset, or from multiple sources) means that the ONS can produce multivariate statistics, to understand how two variables interact, such as income and ethnic group. In future, these estimates would be developed further with a survey model, as described in brief in Section 4.4. For some topics where administrative sources are yet to reach their full potential, the ONS would continue to use surveys to meet user needs, adjusting sample sizes as necessary.

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20 See glossary in Annex B

In addition to producing estimates, the ONS can facilitate analysis to better understand outcomes over time for specific population groups, and how this can vary across characteristics, such as the outcomes for children with experience of care. As described in Section 3.4, this could be achieved by rolling forward a limited range of anonymised Census 2021 data, updated with births, deaths and migration information, creating a Longitudinal Population Dataset (LPD). Subject to suppliers' and ethical approval, the LPD's de-identified longitudinal data assets could be made available to accredited researchers securely through the Secure Research Service. The LPD also has the capacity to provide a better way of linking data to produce admin-based characteristics estimates.

Further information on these methods and research produced using them can be found on the ONS website.

4.4 Developing methods further over the next decade

Research to date has demonstrated the viability of these methods as proofs of concept. The next steps for the ONS's work would be to develop the admin-based population and migration estimates, and breakdowns by a number of characteristics, into regularly published official statistics, with priorities informed by the responses to this consultation. Based on the results of this consultation and wider engagement, feedback from users will shape the ONS's progress towards the types of outputs described in Sections 2.2 and 3.

Similarly, the ONS proposes to continue to broaden the available statistics on characteristics. The ONS will continue to develop its understanding of user needs, how far those can be met by administrative data, and the role that surveys should play in a long-term model. This would help the ONS to produce research outputs on the topics that users are interested in and ultimately across a broader range of topics than is covered by a census.

To date, the ONS has focused on demonstrating that more frequent and timely population and migration estimates can be produced using administrative data. The ONS proposes to build on this work by developing quality-driven, statistical frameworks for combining administrative and survey data to produce population and characteristics estimates. Research assessing the quality of individual and linked admin-datasets will be particularly important for inputs to the DPM, where information about the data sources' relative quality is used to calculate estimates.

As the ONS expands the range of admin-based outputs it produces, it will continue developing methods to quantify the statistical uncertainty[21] of the new outputs. This will allow users to consider their priorities for balancing the different measures of quality, and inform how the ONS develops new outputs. Some of this work is already underway. The ONS has outlined its proposals for measuring uncertainty in admin-based international migration estimates, and developed strategic options for improving the coverage of admin-based population estimates. More information about the ONS's work on quality is available on the ONS website.

4.5 Continuing to meet users' needs

The ONS engages with users daily, but at present, it follows a ten-year cycle of engagement and consultation about user needs and question development for population and social statistics, corresponding to the once-a-decade cycle of the census. While work on understanding user needs and developing question design is an ongoing process, the design and delivery of the census naturally plays a significant role in the ten-year cycle of user engagement. Most recently, a topic consultation was held in 2015 for Census 2021, almost six years before census day, and recommendations based on this consultation and research were confirmed in a White Paper in 2018.

Considering a move to a system that is not reliant on a census would allow the ONS the opportunity to revamp its approach to user engagement. This would mean it could respond to requirements from different types of users for different topics. This would align with the desire to have rapid and responsive evidence on the matters of the day, as well as proactively focusing on wide-reaching emerging topics based on user needs.

In addition to responding to the evolving needs of users, the ONS would also want to take advantage of opportunities as administrative data sources are updated to better meet existing needs, and to take advantage of new data sources as they become available. The ONS is maintaining an ongoing dialogue with data providers to understand their operational changes, and would continue to work in partnership with them to ensure the data gathered is as relevant and reliable a source for statistics as possible.

The future engagement model would include the full breadth of users to reflect the whole of society to maintain the golden thread from user needs to outputs. It would take a multi-faceted form, through ongoing engagement as well as through more focused dialogue.

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21 See glossary in Annex B

4.6 Producing coherent UK outputs

The Office for National Statistics (ONS), the Northern Ireland Statistics and Research Agency (NISRA), the National Records of Scotland (NRS) and the Welsh Government are responsible for producing statistics about the population across the UK.

There is particular and significant value to users from consistent, coherent and accessible statistics for the UK, for each nation and geographic areas within each nation. Currently, the ONS is preparing UK census outputs from the 2021 censuses in Northern Ireland, England and Wales, and the 2022 census in Scotland. As with existing census arrangements, meeting the need for coherent UK outputs has been an important factor in the development of the ONS's transformation proposals, while recognising different user needs in different nations of the UK. The ONS has sought to consult and collaborate closely with colleagues across the UK and in the devolved administrations throughout this process.

In November 2022, the National Statistician and the Chief Statisticians and Registrars General of the devolved administrations signed a [cooperation agreement on the future of population, migration, housing and social statistics across the UK](). This statement builds on previous cooperation and formalises a shared priority to produce population estimates that are accessible, timely, and coherent, and which users understand, both now and in the future.

The proposals in this consultation have been prepared by the ONS for England and Wales, and the Welsh Government is a partner in this work. Separate decisions, informed by NRS and NISRA respectively, will be made by the Scottish Government and Northern Ireland Executive to their own timescales.

4.7 Population statistics in other countries

Unlike the UK and the USA, where censuses have traditionally been held every ten years, some countries hold a census every five years. These include Japan, Australia, Ireland, New Zealand and Canada.

There are several examples of countries that do not have a 'traditional' census at all, and they have relied primarily on administrative data for their population statistics for decades. These include the Netherlands, Norway and Denmark. All existing examples of this rely on a population register to function, meaning every person living in those countries has some form of personal identification number which enables data relating to them to be easily linked across multiple sources. These registers are usually compulsory and require citizens to register and deregister when they arrive into or leave the country, or when they move locally. This forms a good basis for producing population estimates. However, they are not perfect, and still suffer from similar challenges to ones faced with administrative sources – such as list inflation when people do not deregister,

and definitional differences with the population that is being estimated. They also often do not contain information about structures of households and family relationships, and countries who have a register-based approach to producing census statistics usually have an address or dwellings-based definition for household statistics (as described in Section 3.2).
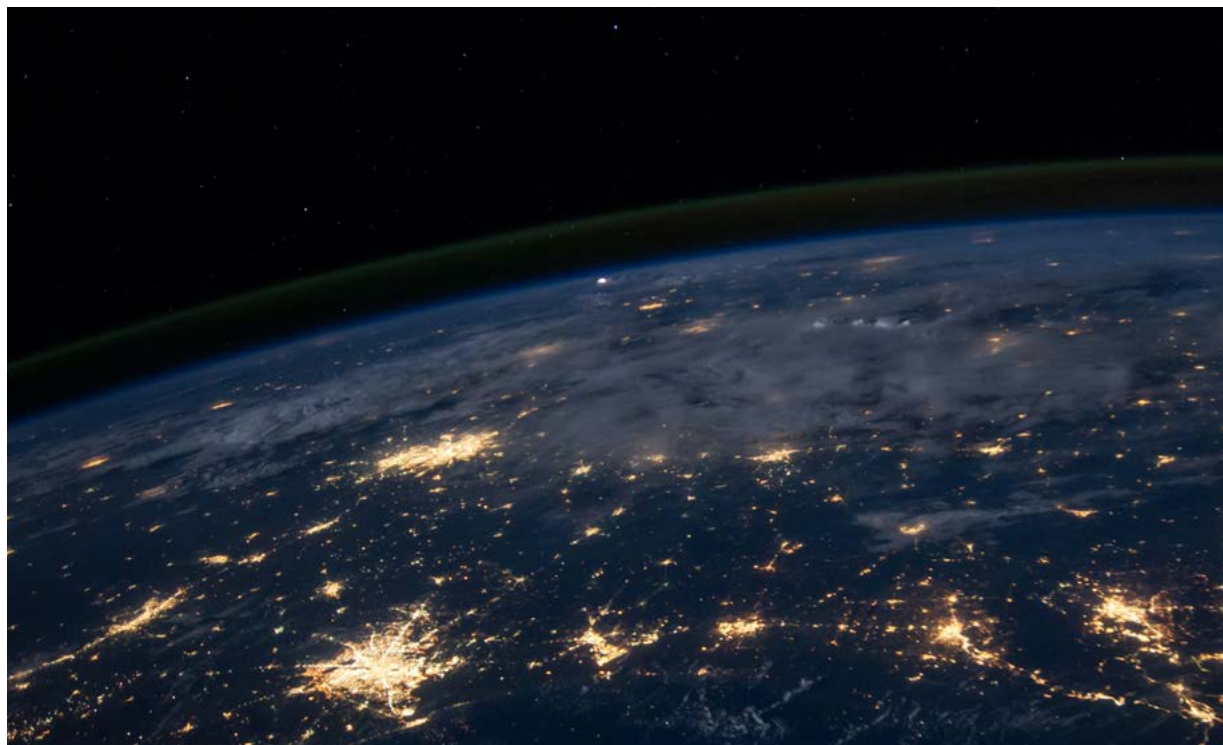
The ONS is developing a system that does not require a population register, functioning instead through the linking of many de-identified data sources and subsequent estimation methods, drawing strength from across a range of data sources to ensure the production of robust, high-quality statistics. These methods include statistical modelling and adjustment through sample surveys. If a population register existed in the UK, it would reduce some of the challenges the ONS faces in linking data from multiple sources that all have different unique identifiers (such as NHS number, National Insurance Number, Pupil ID), and might improve the quality of migration estimates (both internal and international) – but it would face the same challenges that exist with registers discussed previously.

Like the ONS, statistical institutes in several countries are considering moves to 'hybrid' censuses that draw on a range of administrative and survey data sources, for instance in New Zealand, the USA, Canada, and Australia. The ONS regularly contributes to related discussions within the international statistical community. One country to recently move from a traditional census to the hybrid model is Italy in 2018. Their new statistical system employs a range of administrative data in conjunction with mandatory annual sample surveys supported by a population register.

Validation of research and processes

The ONS is independent from Government, with a statutory objective to produce statistics for the public good. The ONS complies with the [Code of Practice for Statistics](#) and with the [UN's Fundamental Principles of Official Statistics](#). The Code's guiding principles of Trustworthiness, Quality and Value underpin the way the ONS produces statistics and how it manages change to these statistics.

For this research, as with all its work, the ONS has built-in assurance around several key themes including:

- understanding public attitudes
- data ethics
- robust methodology

The ONS welcomes the confidence with which the public views its privacy and security measures, with a recent representative household survey[22] finding 90 percent of people believed personal information provided to the ONS would be kept confidential. This record of upholding the best data privacy standards will be maintained into the future.

In focus groups exploring the public's views on its proposals, the ONS has found high levels of support for the use of administrative data for statistical purposes when security and privacy processes were clear and explained alongside benefits to the public. The ONS will continue this engagement around the

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22 [The Public Confidence in Official Statistics survey](#)

use of administrative data in statistics with a broad range of audiences over the coming years. It also abides by the ethical principles of the National Statistician's Data Ethics Advisory Committee (NSDEC), and it is consulting that committee for advice as research continues.

Throughout this transformation programme, ONS research underpinning this consultation has been reviewed by the Methodological Assurance Review Panel. They provide external, independent assurance and guidance on the statistical methodology underpinning ONS statistical production and research.

The panel is chaired by Professor Sir Bernard Silverman and its membership encompasses the skills and expertise to provide robust comprehensive methodological advice on topics including survey design, use of administrative and non-traditional data sources in statistics, statistical modelling, record linkage, small-area multivariate estimation, data science techniques, and demography. Full membership details are available on the UK Statistics Authority website.

The panel has reviewed numerous papers on topics related to the census and to the ONS's transformation programme. Further information can be found in the minutes and papers of panel meetings, which are made available on the UK Statistics Authority website.

The ONS continues to engage with the panel and they will submit a report on their assurance work to the National Statistician ahead of his recommendation. Their report will be made available to the public in due course, in line with other panel papers.

Economic case for change

The proposals in this document set out how the ONS can use administrative data to deliver statistics about the population more often and more quickly, and with a more consistent level of accuracy over time. User feedback from direct engagement and from previous consultations has shaped these proposals and the ONS's vision for the future.

The ONS expects these proposals to deliver the best return on investment while meeting the strategic needs of the ONS and the Government, as well as the users of statistics about the population.
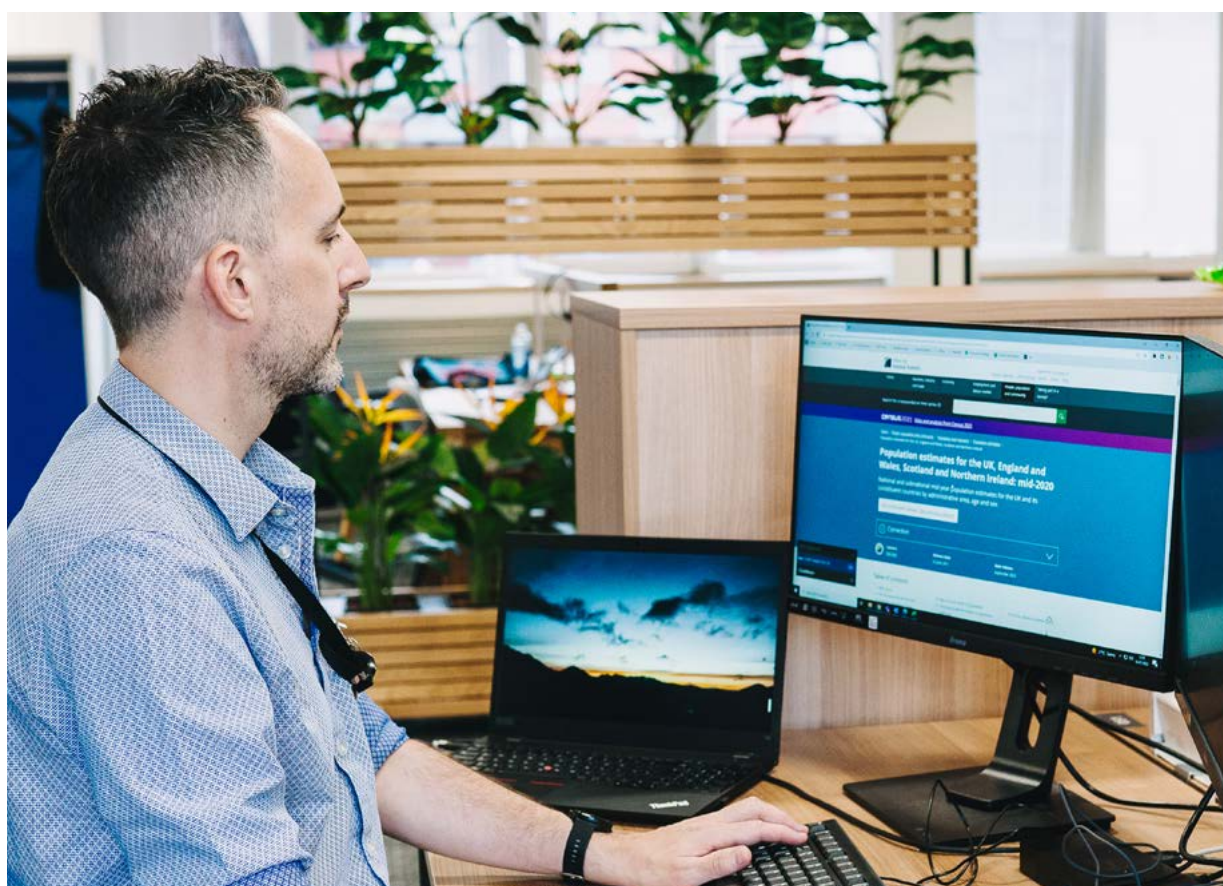
The ONS's proposals have the potential to deliver benefits in excess of the existing census-based system. They would provide users with the ability to identify trends and developments as close as possible to when they happen, and greater flexibility in accessing statistics that answer their questions. This would underpin better investment by decision-makers in central and local government, the private sector and third sector. It would enable public sector bodies to have a better understanding of how the population make-up changes over time and how it relates to other characteristics, improving their ability to tackle the sources of disparities. Improved efficiency through the reuse of existing data would make

the statistical system more sustainable, providing value for money, and reducing the burden on the public by streamlining surveys and questionnaires. The improvements to these statistics would also benefit other ONS statistics that rely on population figures, including economic outputs such as GDP per head, productivity and labour market statistics.

Engagement with users through this consultation will help inform the ONS's analysis of the benefits that more frequent and timely population and migration statistics could deliver. A preliminary analysis, building on the estimated benefits of Census 2021, suggests more up-to-date outputs offer higher present value benefits than the estimated £5.5 billion benefits of a census. The ONS expects to be able to provide a more complete analysis of benefits once potential uses of these data identified in this consultation are taken into account.

The ONS estimates that the proposed transformation would cost less than half the cost of a 2031 census over a ten-year period, with part of this cost being ongoing research and development towards a business-as-usual model. The ONS will continue to refine its estimates of the costs of transformation, in particular considering the needs of users identified through this consultation.

As we continue to see rapid change in the population, these proposals would ensure the ONS is equipped to face the statistical challenges of the future, delivering greater benefits at a reduced cost.

Risks and mitigations

This document sets out the ONS's ambitious proposals for future population and migration statistics. Some challenges remain in realising the ONS's vision fully and quickly. These risks and related mitigations are summarised in the following table:

Risk	Comment and mitigations
Interruptions to supply of data from other organisations	The DPM described in Section 4.3 is designed to draw on a range of sources to minimise reliance on any one source of data. The ONS is working with data owners to create agreements to underpin regular and predictable data supply. Depending on the outcome of this consultation, core requirements surrounding this will form part of the National Statistician's recommendation.
Changes to collection of data upon which ONS statistics rely	It is possible that some data owners may change the data they collect to reflect their operational requirements. Withdrawal of or changes to variables could impact the ONS's ability to produce statistics that rely on such data. The ONS can mitigate this by maintaining close working relationships with data owners in order to understand potential impacts well in advance; conducting audit surveys to better understand the quality of data sources; and by seeking to draw strength from a broad range of data sources such that a change to a single source would not be critical to statistical production.
Inability to meet needs of users through existing sources	The responses to this consultation will inform the ONS's understanding of user requirements across the measures of quality discussed in Section 3. This will influence its data collection strategy over the next decade to meet needs in the most effective way possible, whether through administrative data sources or bespoke data collection.

Risk	Comment and mitigations
"Drift" over time in admin-based estimates	The ONS has already shown that the level of certainty in population estimates is likely to be improved across the ten-year period versus the current model for producing mid-year estimates. Nevertheless, the ONS recognises the importance of independent sources to provide information on the quality and coverage of available data, and this requirement will continue to exist under the proposals set out in this document. Ongoing research and development over the coming decade will determine the best independent sources for this, and this is likely to include an intermittent 'benchmarking' survey.
Effect on data standards in the public sector	The census plays an important role in developing standards for data collection which are harmonised across the Government Statistical Service (GSS). Work is underway within the GSS to consider how this work can inform administrative data collection, consistent with the National Data Strategy.

The ONS has also considered the risks of taking no action to change its statistical system, and continuing with a full-scale census once per decade, supported primarily by surveys. These risks and potential mitigations are summarised in the following table.

Risk	Comment and available mitigations
Uncertainty around response rates to full-scale censuses	While Census 2021 in England and Wales enjoyed a high level of public engagement and response, this is an outlier in a wider trend of population censuses and social surveys across the world. In recent cases where response rates to censuses have been below targets, mitigations have included the deadline for responses to census being extended, increased communication campaigns, and greater use of administrative data to enable the production of robust estimates.
Lack of flexibility in responding to new priority needs, including inclusive data needs or needs for local information	In the years between censuses many ONS social statistics do not provide data at a local level. This means that when new priority needs for information emerge, the only options outside using administrative data are to wait for the next census to ask a related question, or to make use of social surveys. In many cases at present surveys do not allow the ONS to reach below the regional level.
Increasing levels of uncertainty in mid-year population estimates	Without making use of administrative data sources, there is currently no mitigation to combat the increasing levels of uncertainty in our population statistics across the decade. This means that over the ten-year period, mid-year estimates for some local authorities can be over- or underestimated by up to 10%.
Increasing levels of cost	Should a full-scale census be required in 2031, it is estimated that its cost will increase by at least 33% based on known costs for the most recent census operation, and accounting for optimism bias and inflation.
Duplication of effort in data collection	Currently, a significant portion of the data collected through the census is already collected by organisations across the public sector. Continuing to hold a census every ten years would duplicate this data collection and miss the opportunity to make the public sector's approach to data more joined-up and sustainable.

SECTION 8:

Next steps and how to take part

Thank you for taking the time to read through this consultation. The ONS has set out its proposals to embed administrative data at the core of its statistics, and the progress made in demonstrating the viability and quality of the proposed system.

Following this consultation, the UK Statistics Authority, on the advice of the National Statistician, will make a recommendation on the future production of high-quality population and migration statistics that serve the public good, including a recommendation on the future of the census in England and Wales. Responses to this recommendation are expected from Ministers in the UK and Welsh Governments, with the decision whether to call a census in England and Wales resting with the UK Government, as set out in the Census Act 1920

This recommendation will be based on the evaluation of progress against three high-level criteria:

1. The ONS's plan for the future statistical system is supported by users as meeting their core user needs for statistics about the size and composition of the population of England and Wales, its characteristics and housing stock.

2. This statistical system will be flexible and resilient enough to respond at pace to future and emerging user needs, adapting to changes in available data sources; and will be capable of going beyond core needs.

3. Methods and approaches are peer-reviewed and compliant with relevant legislative and ethical considerations, and the ONS's plans are accepted by the public, with a business case and programme plan in place to deliver a sustainable statistical system.

Your responses to this consultation will help inform this evaluation, and the development of the National Statistician's recommendation.

The ONS will provide an update within 12 weeks of the consultation's closing date and publish a dedicated report on the responses to this consultation. This will inform the recommendation.

You are invited to respond to the consultation questionnaire before its closing date of Thursday 26 October 2023. You can complete the consultation questionnaire online or at the end of this document. The consultation document and questionnaire are also available physically and in large print on request.

Enquiries can be addressed to **2023consultation@ons.gov.uk**, ONS Customer Services on **01329 444 972**, or by post at:

ONS Consultations Team
Post Room
Office for National Statistics
Segensworth Road
Fareham PO15 5RR

We look forward to hearing from you.

Confidentiality and data protection

The Office for National Statistics (ONS) needs your name and email address to receive your response. We may contact you about your response to the consultation.

We aim to be as open as possible in our decision-making process. As part of this, we plan to publish an anonymised summary of the responses we receive. We will not publish the personal name of any respondent. Names of individuals, organisations and groups will not be linked to any comments that you give.

The names of all organisations and groups responding to the consultation will be published in a list of respondents.

Please be aware that, as a public authority, we are subject to the Freedom of Information Act and can never completely guarantee that names and responses will not be published. We will not publish personal contact details, such as email addresses. To find out more, read our Privacy Policy.

This consultation has been carried out in accordance with the government's consultation principles. If you have any complaints about the way this consultation has been conducted, please email: **2023consultation@ons.gov.uk**.

Questionnaire

General information

Our transformation plans

At the Office for National Statistics (ONS), we want your views on our ambitious plans for the transformation of our population and migration statistics. These statistics cover a wide range of areas, including household characteristics, employment, health, religion and international migration.

High-quality, timely population statistics are essential to ensure people get the services and support they need within communities and nationwide. We are consulting to ensure that the population and migration statistics and analysis we produce continue to meet the changing needs of policy makers, citizens, and other data users. Our statistics should give you frequent, clear, timely and detailed insights into society. We also want to improve the coverage and accuracy of our statistics over time. To make sure that we meet your needs, we need your feedback on our proposals.

The consultation document explains the ONS's proposals to create a sustainable system for producing essential, up-to-date statistics about the population. To do this, the system would primarily use administrative data such as tax or benefit data, complemented by survey data and a wider range of data sources. This could radically improve the statistics that the ONS produces each year and could replace the current reliance on the census every ten years. This consultation is seeking views on how these proposals meet the needs of users of ONS statistics compared to a system based on a census.

Learn more about how we will deliver population and social statistics in the future by watching our [transformation journey video](#).

Who should take part?

We welcome contributions from all users. This includes those who are experienced users of ONS's statistics, through to those who are looking to use ONS population and migration data for the first time. We value everyone's feedback.

How to take part

When you complete the questionnaire, only the first section, 'About you' is mandatory, all other sections are optional. This means that you can choose what you comment on.

We ask you to consider our proposals and respond to this consultation before 11:59pm on Thursday 26 October 2023. A better understanding of your needs and priorities will help us shape our plans for these important statistics.

You can contact the ONS for help or further information about this consultation at **2023consultation@ons.gov.uk**

Thank you.

About you

The ONS needs your name and email address to use your consultation response. We may contact you about your response to the consultation.

We aim to be as open as possible in our decision-making process. As part of this, we plan to publish an anonymised summary of the responses we receive. We will not publish names or other personal data of any individual respondent. However, the names of all organisations and groups responding to the consultation will be published in a list of respondents. Names of organisations and groups will not be linked to any comments given.

Please be aware that, as a public authority, we are subject to the Freedom of Information Act and can never completely guarantee that names and responses will not be published. To find out more, read our Privacy Policy Privacy – Office for National Statistics – Citizen Space (ons.gov.uk)

Full name
Required

....

Email address
We will use this to confirm your response has been received.
Required

....

Are you answering this questionnaire on behalf of an organisation?
Required

☐ Yes

☐ No

If you are responding on behalf of an organisation:
What is the name of the organisation?
Required

....

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What sector does the organisation belong to?
Required

☐ Central government

☐ Devolved administration

☐ Local government

☐ Other public body, for example health, transport, or emergency services

☐ Academia or research

☐ Religion or faith

☐ Charity or voluntary

☐ Business, industry or commercial

☐ Journalism or media

☐ Think tank

☐ No sector, I am responding in a personal capacity

☐ Other

If you selected 'Other', please provide your organisation's sector below.

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In the last 12 months, approximately how often have you used or referred to statistics from the ONS?

☐ Daily

☐ A few times a week

☐ A few times a month

☐ A few times a year

☐ Less frequently than a few times a year

☐ Never

What do you currently use the ONS's population statistics for?

☐ Academic research

☐ Service provision or business planning

☐ Personal use

☐ Public policy

☐ Other

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Your population and migration statistical needs

1a. Please explain how you currently use ONS population and migration statistics.

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1b. Throughout the consultation document we have outlined our proposals for changes to our population and migration statistics, with detail provided in Section 3.

To what extent do these proposals meet your needs?

☐ The proposals meet all of my needs

☐ The proposals meet some of my needs

☐ The proposals do not meet any of my needs

1c. We have outlined the potential benefits of the transformed system within Section 6 of the consultation document.

Are your current information needs better met by these proposals?

☐ Yes

☐ No

If 'No', please go to question 1d. If 'yes', please continue.

Which of your information needs are better met by these proposals? Please explain the reasons for your answer.

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1d. Would these proposals allow you to do anything new that you have not previously been able to do?

☐ Yes

☐ No

☐ I don't know

☐ I have no need to do anything new

Please explain the reasons for your answer.

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See Section 6 of the consultation document for further detail

If you answered 'These proposals meet all of my needs' in question 1b, please go to Section 3. Otherwise, please continue.

1e. Which of your current needs would not be met by these proposals?
Please include reasons for your answer. For example, information around levels of detail, accuracy, timeliness or geography.

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Impact on your information needs

We are interested in how our proposal will impact your information needs.

2a. In the consultation document we have outlined our ambition to deliver characteristics estimates at Local Authority level, with some being available at lower levels (for example Lower Super Output Area). See Section 3.3.3 of the consultation document for further detail.

Do the proposed levels of geographic breakdown meet your information needs?

☐ Yes

☐ No

☐ I don't know

What additional geographic breakdowns would you need?
Please explain the reasons for your answer.

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2b. The use of administrative data could result in less detailed breakdowns for characteristics being available, particularly where more detailed breakdowns are collected in the census beyond standard tick-box options. See Section 3.3.3 of the consultation document for further detail.

Would this change in available detail still meet your needs?

☐ Yes

☐ No

☐ I don't know

What impact would this change in available detail have on your use of our population and migration statistics?
Please explain your answer.

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Population definitions and estimates

3a. Section 3.1.1 of the consultation document explains that we will continue to produce population and migration estimates based on our current 'usual resident' definition but are exploring alternative definitions.

Do you need definitions for population estimates other than 'usual resident'?

☐ Yes

☐ No

If 'No', go to question 4a. If 'Yes', please continue.

3b. Section 3.1.1 of the consultation document outlines the potential to also provide estimates of populations based on different reference periods, these are termed "population present".

For population present estimates, what is of interest to you? Please select all that apply and explain the reason for needing each definition.

☐ Overnight

☐ By day of week

☐ Daytime

☐ By weekday or weekend

☐ Average

☐ As a weekly average

☐ Other

☐ I don't need data on "population present".

Please explain why you need this definition of "population present".

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3c. What, if any, other definitions could we use to estimate population and migration that would better meet your needs?

Please explain the reasons for needing any additional definitions.

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Delivering future population estimates

4a. Section 3.1 of the consultation document sets out our plans for future population estimates. **For the usual resident population how frequently would you like population estimates?**
Please select the most important frequency for you.

☐ More frequently than once a year

☐ Annually

☐ I don't use population estimates

☐ Other

If you ticked 'Other', please specify.

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Please explain the reasons for your selected frequency and how it would meet your needs.

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4b. Section 3.1 sets out our plans for delivering provisional and final estimates**. How timely would you like population estimates to be?**

☐ Early provisional estimates, followed by updated estimates 12 months after the reference period

☐ Final estimates only, 12 months after the reference period.

☐ I don't know

☐ I do not use population estimates

Please explain the reason for your answer.

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Data needs for historical purposes

5a. Section 3.5 of the consultation document outlines the potential to securely retain personal information obtained from administrative data used to create our statistics, for historical purposes.

What details from population and social characteristics data do you see as being important to be preserved for future generations, if any?
Please explain why this data is important to be preserved.

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Other comments

6a. Is there anything else about the transformation of population and migration statistics proposal that you wish to add to your response?

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This consultation relates to ONS population and migration statistics for England and Wales, which contribute to the production of UK statistics.

Which of these geographies do you mainly use ONS population statistics for? If you use more than one, please select all that apply.

☐ England and Wales

☐ Wales only

☐ England only

☐ UK-wide

☐ None of these

Thank you for taking the time to complete this consultation.

Can ONS contact you for further information on your answers?

☐ Yes

☐ No

Glossary

Administrative data, or admin data:

Information that is collected for administrative or operational purposes, such as through the tax, benefits, health and education systems.

Accuracy (quality):

How close statistics are to true values.

Bias:

The degree to which a statistic under- or over-estimates, relative to a 'true' value.

Characteristics estimates:

Statistics about the number of people with a given characteristic, such as ethnic group or specific levels of qualifications. Univariate estimates describe a single characteristic, and multivariate estimates describe two or more.

De-identified data:

Data from which direct identifiers (such as name, address, date of birth or operational IDs, such as National Insurance number) have been removed.

Detail (quality):

The level of detail of classifications available in statistics (for example whether 'age' can be broken down into single years, or age bands).

Dynamic Population Model (DPM):

A statistical modelling approach that uses a range of data to measure the population and population changes in a fully coherent way. Described further in Section 4.3.

Frequency (quality):

How often statistics in a series are produced.

Geography (quality):

How detailed statistics are, in terms of geographic coverage (see LSOA, MSOA and OA below).

Longitudinal Population Dataset (LPD):

A dataset that would allow the understanding of outcomes over time in different population groups, such as the outcomes of children with experience of care. Described further in Section 4.3.

Lower-Layer Super Output Area (LSOA):

Geographical area for ONS statistics, usually comprising four or five Output Areas (OAs) and containing between 400 to 1,200 households (1,000 to 3,000 people).

Middle-Layer Super Output Area (MSOA):

Geographical area for ONS statistics, usually comprising four or five LSOAs, and containing between 2,000 and 6,000 households (5,000 to 15,000 people).

Missingness:

The absence of information about individuals with certain characteristics in administrative data sources. Using additional sources and methods can help to produce estimates that account for missingness.

Multivariate estimates:

Statistics that combine variables together, allowing the comparison of, for example, the numbers of people in different ethnic groups and the types of housing they live in.

Output Area (OA):

The lowest level of geographical area for census statistics, consisting of between 40 to 250 households (100 to 625 people).

Population estimates:

Statistics about the numbers of people in a given geographic area, including information about how these numbers break down by age and sex.

Protected characteristics:

Nine characteristics which are protected by law under the Equality Act 2010. These are: age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation.

Quality standards:

The intended level of statistical quality for estimates. In the case of the proposed transformed population and migration statistics, these standards are based on those achieved by the current census- and mid-year estimates-based system across the decade between the 2011 census and the year before Census 2021. This period incorporates both the high statistical quality of census outputs, and the decline in quality moving further away from the census year. In this case the quality standard is based on the quality estimated for the 2016 mid-year estimates, which reflects the average over the decade. Further information on the quality standards can be found in a paper for the Methodological Assurance Review Panel.

Reference date:

The date about which statistics relate. For example, the reference date for Census 2021 estimates is Census Day (21 March 2021).

'Rolled-forward' estimates:

Estimates that are produced by amending estimates for previous reference dates with data from other sources to create a new estimate, rather than each estimate being based on fresh data. Currently, mid-year estimates are produced by rolling forward data from the most recent census, and complementing it with data from administrative and survey sources, year on year.

Statistical Population Dataset (SPD):

An anonymised dataset that forms the basis for estimation of the size of the resident population through the Dynamic Population Model (DPM). It is produced by securely linking records across multiple administrative data sources and applying a set of inclusion and distribution rules. These were formerly referred to as Admin-based Population Estimates (ABPEs). Described further in Section 4.3.

Timeliness (quality):

How soon statistics are published after the reference date (the date they describe).

Uncertainty:

How precise an estimate is, also known as 'variance'. For example, we might say an area has a population estimate of 100,000 people, with a 95% confidence interval of plus or minus 2%. This means we are 95% sure that the 'true' population count is somewhere between 98,000 and 102,000. The narrower the confidence interval width, the more certain we are in the precision of the estimate.

Univariate estimates:

Statistics that describe a single variable, such as the numbers of people in different ethnic groups, or the numbers of different types of housing in a certain area. Combinations of univariate data make up multivariate estimates.

Comparison of current and future outputs in England and Wales

The following tables use the measures of quality to summarise the broad strengths and weaknesses of (i) estimates from the census, (ii) estimates currently produced between censuses, and (iii) the baseline ambition for future outputs the ONS could produce with its proposed methods. The ONS's baseline ambition is based on its current assessment of user needs and data availability, there are some topics where the ONS can go further than the baseline, and there are others where further development is needed to meet the baseline using administrative data sources. No measures of accuracy are currently available for characteristics estimates. Differences in detail are discussed in Section 3.3.3.

Population estimates

Current census estimates	Current 'intercensal' estimates	Future estimates
Frequency: Every 10 years.	**Frequency:** Annual.	**Frequency:** Annual.
Timeliness and geography: 15-month lag at the Output Area level (100 to 625 people).	**Timeliness and geography:** 12-month lag at the local authority level (LA); 15-month lag at the LSOA level (about 1,000 to 3000 people).	**Timeliness and geography:** 6-month lag for provisional estimates, 12-month lag for updated estimates, at the LA level, with the potential for LSOA level dependent on the quality of input data.
Accuracy: Highly accurate estimates.	**Accuracy:** Estimates decline in accuracy over the 10-year period.	**Accuracy:** Consistent level of accuracy across the 10-year period.

Household estimates

Current census estimates	Current 'intercensal' estimates	Future estimates
Frequency: Every 10 years.	**Frequency:** Annual.	**Frequency:** Annual.
Timeliness: 18-month lag.	**Timeliness**: 5-month lag.	**Timeliness:** 12-month lag.
Geography: Output Area level.	**Geography:** Regional.	**Geography:** Local authority level demonstrated with ambition to reach LSOA level.

Housing estimates

Current census estimates	Current 'intercensal' estimates	Future estimates
Frequency: Every 10 years.	**Frequency:** Varies for different variables, between every 1 to 5 years, or not available.	**Frequency:** Annual.
Timeliness: 22-month lag.	Varies from 1 month to five years.	**Timeliness:** 12 to 18 month lag with the potential for shorter lags for some topics (3 to 6 month lag).
Geography: Output Area level.	**Geography:** From individual address to LA level.	**Geography:** LSOA level with the potential for OA level.

Univariate characteristics estimates

Current census estimates	Current 'intercensal' estimates	Future estimates
Frequency and timeliness: Every 10 years, with a lag of 18 to 24 months.	**Frequency and timeliness:** Varies for different topics Statistics may be produced annually, biennially, or not produced at all, with lags of between 6 and 24 months.	**Frequency and timeliness:** Varies for different topics. Section 3.3 details our realistic ambition across all existing census topics, with many anticipated to be produced annually or every two years, mostly with a 12 to 15 month lag.
Geography: OA or LSOA level.	**Geography:** Mostly regional, some LA level.	**Geography:** Varies for different topics. Section 3.3 details our realistic ambition across all census topics, generally between LSOA and LA level.

Multivariate characteristics estimates

Current census estimates	Current 'intercensal' estimates	Future estimates
Frequency: Every 10 years.	**Frequency:** Varies for different topics, with many not produced between censuses.	**Frequency:** As often as possible, depending on contributing univariate data; our realistic ambition for most topics is for annual or biennial outputs (see Section 3.3).
Timeliness: 2-year lag.	**Timeliness:** Varies, up to a lag of 24 months.	**Timeliness:** As timely as possible, depending on contributing univariate data (Section 3.3). This would result in a 15 to 18 month lag for most topics.
Geography: LSOA to LA level.	**Geography:** Mostly regional, some LA level.	**Geography:** LSOA to LA level for most topics (based on contributing univariate data – see Section 3.3)

Longitudinal capability

Current census estimates	Current 'intercensal' estimates	Future estimates
1% Longitudinal Study using census data and a selection of administrative sources to understand how life events vary by characteristics.	N/A	Anonymous Longitudinal Population Dataset, which aims to be representative of the population in England and Wales. The comprehensive coverage means the potential for studies and research is vastly expanded, particularly for minority groups and populations at lower levels of geography.