

Response summary: New mortality assumptions method for national population projections

User engagement exercise

Population and household projections
Demographic analysis unit

Office for National Statistics

May 2023



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Contact information

Please send enquiries to projections@ons.gov.uk.

Accessibility

This engagement exercise response can be provided in alternative formats upon request.

If you have any feedback about the way this engagement exercise has been conducted, please email external.affairs@ons.gov.uk.

About the engagement exercise

This document summarises the responses received to the Office for National Statistics (ONS) “New mortality assumptions method for national population projections” engagement exercise and sets out what actions we plan to take as a result.

The engagement exercise ran for six weeks, from 9 January to 20 February 2023. It allowed us to gather feedback on the planned use of our statistics that could arise from the prospective change to the new mortality projection methodology. The engagement exercise was conducted in line with the [Code of Practice for Statistics](#).

We thank everybody who shared their views by responding to the engagement exercise.

As a result of this feedback and with agreement from the national population projections (NPP) Committee, we will adopt the new mortality projection methodology and provide guidance to users on its use in the next round of NPPs, which will incorporate Census 2021 data for England, Wales and Northern Ireland.

Background

The national population projections (NPPs) are used within and outside of government as the definitive set of national population projections. The primary purpose of the projections is to provide information on potential future population levels. They are used as a common framework for national planning and policymaking. Examples of their uses include forming fiscal projections, identifying future demand for health and education services, and estimating the future cost of state pensions. They are also used in the production of subnational population projections and household projections.

We normally publish NPPs by age and sex for the UK and its constituent countries every two years; this changed around the time of the recent census. We base NPPs on the latest mid-year population estimates, together with assumptions about future levels of fertility, mortality and migration. We published the 2020-based NPPs in January 2022. These were subsequently superseded by a data only release in January 2023: [2020-based interim national population projections: year ending June 2022 estimated international migration variant](#). The next NPPs will incorporate Census 2021 data (for England, Wales and Northern Ireland) and we will update the [ONS release calendar](#) to reflect the latest information available.

We produce NPPs on behalf of the National Statistician and the Registrars General for Scotland and Northern Ireland. We agree the underlying assumptions with the devolved administrations – Welsh Government, National Records of Scotland (NRS) and Northern Ireland Statistics and Research Agency (NISRA). Information on our mortality assumption

setting process, which is always kept under review, can be found in Section 3 of our [National population projections, mortality assumptions: 2020-based interim article](#).

We developed the new mortality projection methodology for the NPPs as part of our strategy to continuously review and improve our methods. This new mortality projection method offers improvements in efficiency, replicability, and greater transparency than the current method.

The proposed new mortality projection method uses an age-period-cohort (APC) model that is a well-established approach for projecting mortality improvements. This model has been developed by the ONS, Methods and Quality Directorate in collaboration with the University of Southampton and the University of Warwick. The method fits linear models to historical data (separately for males and females, for both the UK and Scotland). The fitted values from the model are then used to project mortality improvement rates into the future, constrained to expert opinion on mortality improvement in the long term.

We explain the prospective new mortality projection method in more detail in our [Prospective new method for setting mortality assumptions for national population projections, UK: January 2023 article](#). It also highlights initial comparative results between the current method and the proposed model for 2018-based and 2020-based NPPs.

Summary of responses

We promoted the engagement exercise on social media and also informed users through our regular communication channels including email. We received a total of 23 responses.

In the following analyses, the response totals do not sum to 23 as the questions were not answered by all.

Questions about the respondent

Questionnaire section 2: About your response questions 3, 4, and 5

Are you responding to this survey in a personal or a professional capacity?

A total of 10 individuals reported responding in a personal capacity, 10 in a professional capacity, while for 3 respondents it was unknown as these respondents provided selective feedback by email.

Are you answering this survey on behalf of an organisation or a group?

Responses included individuals providing a personal view, individuals representing organisations or informal groups, and collective responses from organisations. Overall, 7 respondents were reporting feedback on behalf of an organisation or an informal group, such as a community or social media group, and 16 were not.

If responding in a professional capacity, what sector do you work in?

The following table shows the sectors respondents worked in.

Table 1: Responses by the sector the respondent worked in

Sector	Number of responses
Academia and research	3
Business	6
Government, including local government and public bodies	6
Think tanks	0
Voluntary, community and social enterprise	0
Other	0
Total	15

There were 8 respondents where the sector categories did not apply because they responded in a personal capacity.

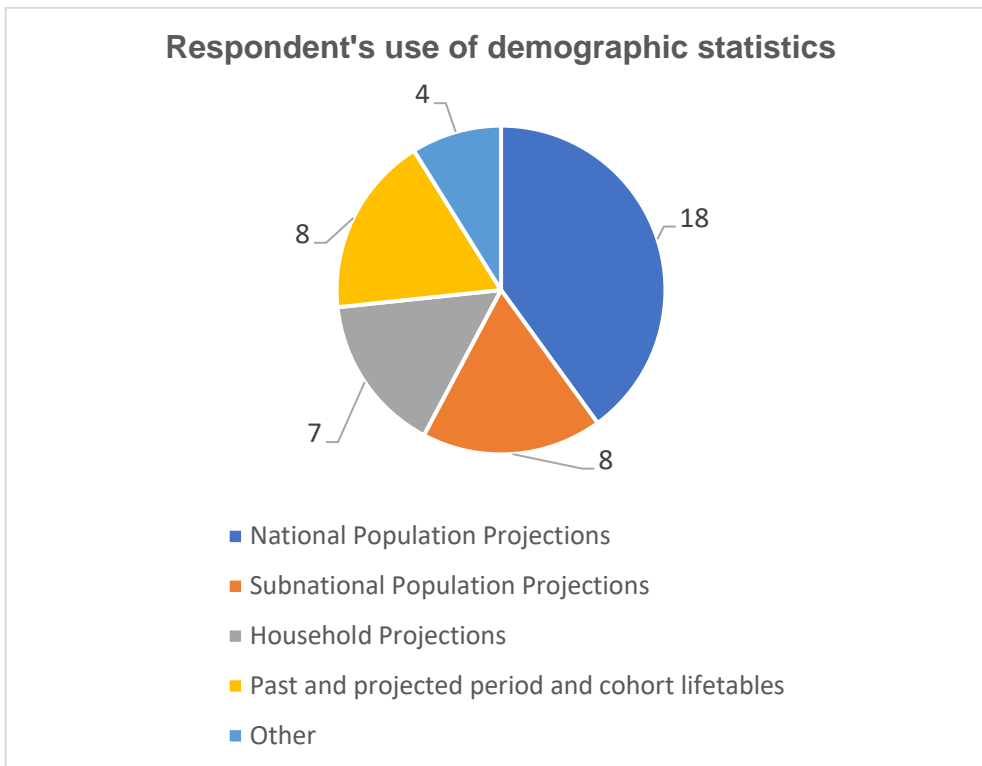
Questions about the respondent's use of statistics and comments on the new mortality projection methodology

Questionnaire section 3: Your use of our statistics questions: 6, 7, 8, 9, 10, and 11

What demographic statistics do you use?

Figure 1 shows the proportion of all demographic statistics used by respondents.

Figure 1: Respondent's use of demographic statistics



For what purpose(s) do you use the demographic statistics stated in question 6?

Respondents use our demographic statistics for:

- assessing future needs and demand for services such as health provision, public transport, and housing
- incorporating information from various projections into assessment work for local planning
- forecasting the future level of population at the local level and projecting the number of pupils in need of school provision in the local area
- assessing household plans using household projections with future levels of population and pupil projections

Other purposes included:

- producing forecasts used by policy analysts in national level planning

- calculating healthy life expectancy
- using projections as a benchmark for other models (for example, in other government bodies) regarding their own strategic plans and institutional remits
- using to either inform or comment on current or proposed governmental policies
- developing strategic plans for local business and educational purposes
- projecting future contributed income and expenditure and mortality improvement projections in national level planning
- use for various academic research and publications including areas of health, demography, and population projections
- estimating population levels in future years
- personal interest in the UK's demographic statistics

What are your overall comments on the prospective mortality projection methodology?

The majority of responses were supportive and in approval of the new proposed mortality model. Some responses highlighted that it:

- appears to be sensible and adjusts for shocks such as the coronavirus (COVID-19) pandemic
- is statistically sound, in line with microsimulation models across population cohorts
- provides an opportunity to make further developments to take account of other potential mortality shocks over time (for example, climate change, natural disasters, or war)
- is a sensible approach for a data driven fitted model that incorporates experts' inputs
- provides an added flexibility through incorporation of weighting within the model
- would benefit from worked examples in our methodology information

Some of the respondents thought it would be beneficial if the proposed model could be applied retrospectively, to test its accuracy and how it would have performed in the past (for example, in comparison with observed mortality). One respondent suggested considering recovery rates from mortality shocks, and another respondent mentioned that the weighting of the input data should be reviewed across years.

Some respondents requested that other factors which affect mortality (other than age and sex) are incorporated into the model for example, ethnic group, deprivation decile, drug use and medical advancements. Respondents also provided some detailed comments on specific aspects of the methodology and how these could be investigated further.

Other comments from respondents highlighted support for these changes and they noted how the approach is like many of these suites of models, in particular fitting an age-period-cohort model to mortality improvements.

Are there any impacts for your use of the statistics stated in question 7 from the prospective change in methodology?

Most of the respondents mentioned that the prospective change in methodology has no direct impact on their work. However, some noted they would not be able to reproduce the ONS model for small areas, which is instrumental in business planning. One mentioned a direct shift in the calculated liabilities that would differ from results derived from the current methodology. Also, one respondent highlighted the importance of assessing the sensitivity of life expectancy to the weighting of the input data.

Are there any implications for your use of the statistics stated in question 7 from the prospective change in methodology?

Most of the respondents mentioned that the prospective change in methodology has no implications for their use of the statistics. However, one respondent mentioned that the change in methodology could affect planning the right provision of services and infrastructure in the transport sector. Another respondent mentioned that changes in the adult population could have implications in adult social care provision. One respondent commented on how the change in methodology would affect comparisons of life expectancies over time. Another respondent reported on the implications of cohort effects, and the potential for investigating recovery rates further after mortality shocks.

Are there any further changes, explanations, or suggestions that you would welcome from the new methodology?

Respondents were content with the new proposed methodology and appreciated that it enables incorporation of:

- age effects, changes in mortality over time at a particular age
- period effects, reflecting external factors affecting mortality
- cohort effects, impact of birth cohort on mortality

There were a number of further suggestions, including:

- applying the new proposed methodology retrospectively to allow re-evaluation of previous runs of projections and assess the improvement rates obtained from using the new model
- providing open data tables for the 2018 and 2020 projections using the new methodology as an evaluation piece of work
- sharing the data and code used in the new mortality projection, so that the provisional results could be replicated and better understood by users
- expanding on the reasons provided by the expert panel to justify the 1.2% long term mortality improvement rate at most ages
- exploring the option of producing a more comprehensive package of variants
- publishing the full model with flexibility of user input for some parameters, for example, long term improvement rates, speed of convergence from the base year improvements to the long-term rates and weighting

Questions about population projections or other demographic statistics and the engagement exercise

Section 4: And finally...

Do you have any other comments about population projections or other demographic statistics from the Office for National Statistics (ONS)?

One respondent recommended the production of more variants when there is more uncertainty around demographic behaviour, and another commented on the need to explore the degree of uncertainty in measuring international outmigration. Another respondent showed an interest in our rationale behind plans for returning to a two-year cycle of production for 2021-based NPPs, because they considered that it would be possible to incorporate 2022 data more in-line with demographic behaviour after the coronavirus pandemic. Another respondent would like to see NPPs being more visible in news articles. Lastly, there were a few responses that were not directly covering projections or demographic statistics.

Do you have any other comments about this user engagement?

Most of the respondents showed an appreciation for being given an opportunity to provide feedback on the new mortality projection model and were thankful for being included in the engagement process.

One respondent provided feedback that they had found navigating across links and the questionnaire not a fully friction free experience. Another respondent mentioned that it would have been beneficial if the proposal had been communicated more clearly. This would help them provide further and more thorough feedback.

Two responses demonstrated a degree of distrust of government and user engagement exercises.

How did you, or the organisation or group that you are responding on behalf of, hear about this user engagement?

Most responses were prompted by our official communication channels such as ONS email (10 responses), website and blog post (5 responses). One respondent reported being invited to take part in our consultation exercise through social media. A total of 7 respondents did not specify how they heard about this user engagement. Please see Table 2 for a full breakdown.

Table 2: Responses by the method the respondent heard about the user engagement

Method	Number of responses
ONS email	10
ONS website or blog	5
Social Media	1

Other	2
Unknown or no answer	5

Our actions

The purpose of this engagement exercise was to gather feedback on the planned use of our statistics among users, that could arise from the prospective change to the new mortality projection method.

We have concluded from the results of the feedback that the mortality projection method is an improvement compared with our current method and will produce outputs that will broadly meet users' needs. We plan to implement this method for the next round of national population projections (NPPs).

We have noted that users require more information about the model. We will publish detailed guidance and an updated NPP Quality and Methodology Information (QMI) report, including information about the strengths and weaknesses of any projections produced and guidance on how to use them.

We will consider how we can make the model code publicly available. The input data are largely already in the public domain.

We will review the specification of the model as part of our regular production of projections, including weighting and shock adjustments and will be transparent with users about any changes that we make.

We will continue to make a summary of the NPP expert advisory panel meeting minutes and the membership available to users on request, to ensure that the assumption setting process is transparent. This will include information on the evidence to support the assumed long-term rates of mortality improvement by age and sex and the speed of convergence to these long-term rates.

Getting in touch

We welcome feedback on the results of this engagement exercise. Please email projections@ons.gov.uk.

We will communicate updates through our Demography newsletter. Please email pop.info@ons.gov.uk if you would like to sign up to receive these newsletters. The [Office for National Statistics \(ONS\) release calendar](#) contains information on the next national population projections provisional release and will be updated accordingly.

See further information on [ONS consultations](#).
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