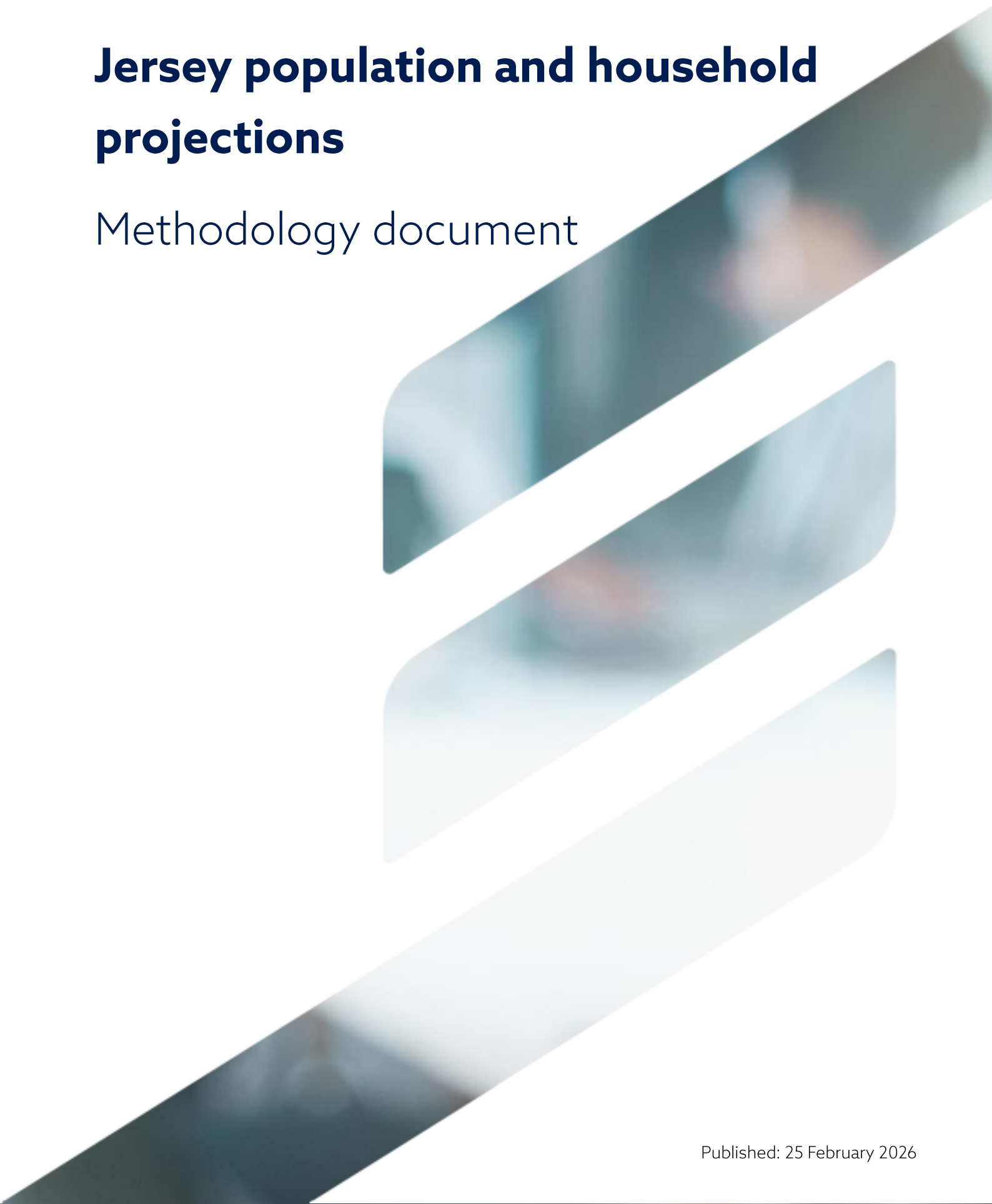
Statistics Jersey

Jersey population and household projections

Methodology document



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1 Introduction

This document describes the methodology behind the Population projections 2025 to 2080 and Households and housing needs projections 2025 to 2040 reports. These outputs provide data on the projected future size and structure of Jersey's resident population, and numbers of households, that would arise under particular scenarios of migration, and assumptions of fertility and mortality.

The population projections use the 2024 end-of-year population figures from the latest Jersey population and migration statistics as a baseline. The projection model uses this baseline population and projects the population forwards year by year, by adding births, subtracting deaths and adjusting for inward and outward migration. Some changes have been made in the methodology since the previous projections report, which are described in more detail in a separate explainer document:

- an updated set of five net migration scenarios
- an updated mid-range fertility assumption
- the addition of four alternative assumptions for both fertility and life expectancy

Household projections take the population projections and use information from census years around changes to household composition to estimate the number of households that correspond to the projected population size and make-up.

It is important to note that the projections are not forecasts and so will differ from the actual future outcomes. Changes to the assumptions will impact the results, therefore the findings should be considered an estimate based on recent trends to inform decision making.

Contents

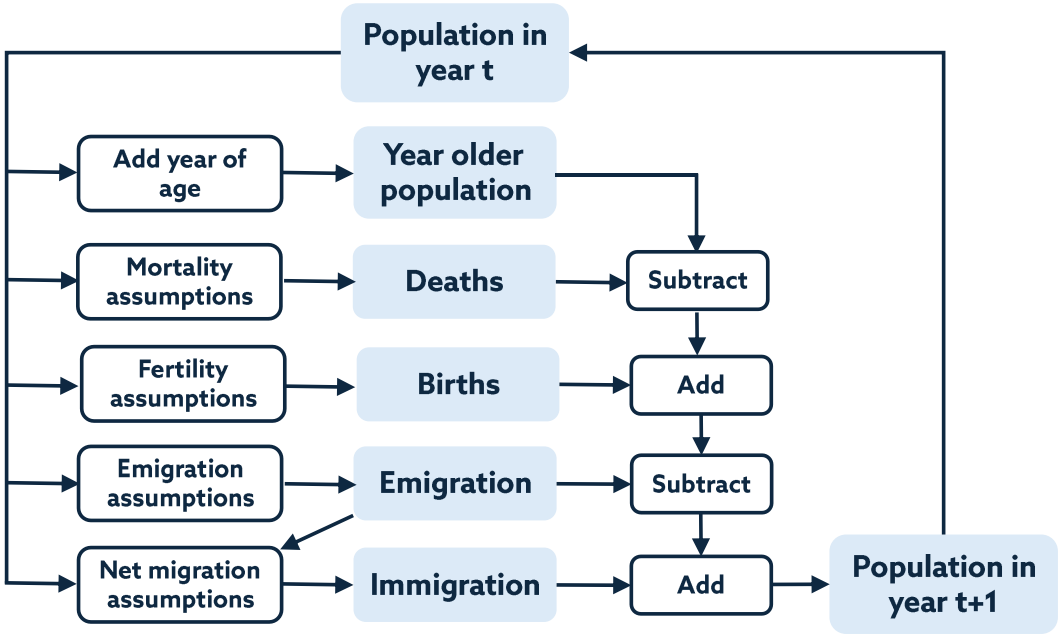
2 Methodology

2.1 Population projections: cohort component method

The population projections use the cohort component method. The projections use a baseline of residents in Jersey based on the 2024 Jersey population and migration statistics. The model uses this baseline population and projects the population forwards year by year, by adding births, subtracting deaths and adjusting for outward and inward migration.

These projections model the end-of-year population by single year of age, sex, residential and employment status, and years continuously resident and projects forward one year at a time. The basic process is illustrated in the diagram below.

Figure 1: The cohort component method



2.2 Household projections

Census data from 2011 and 2021 was used to analyse how the composition of households is changing over time. To do this, the proportion of people who were the 'head' of their household (the 'headship rate') was calculated for six age groups separately for men and women.[1] This was repeated for each of six household types, such as single adult households or adult couple households. The household types were further subdivided into two groups, those living in non-qualified accommodation and those living in qualified accommodation (this includes owner-occupied, social and private rental).

The change in headship rates between the 2011 census and the 2021 census were projected forwards using the following two-point exponential model:

$$y_t = k + ab^{x_t}$$

where t = the year, from 2025 to 2040
y_t = headship rate in year t
$k = 1$ if $y_{2021} \geq y_{2011}$; 0 if $y_{2021} < y_{2011}$
$a = y_{2011} - k$
$b = \dfrac{y_{2021} - k}{y_{2011} - k}$
$x_t = \dfrac{t - 2011}{2021 - 2011}$

Projected headship (and non-headship) rates were constrained to sum to one within each age group. The age groups used in the analysis were:

- 0 – 15 years
- 16 – 29 years
- 30 – 44 years
- 45 – 59 years
- 60 – 74 years
- 75+ years

The household projections were then calculated by applying these projected headship rates to the projected population living in private households to give an estimate of the number of heads of household (and therefore the number of households) in each of the projection years for each age group, sex, household type and whether qualified or non-qualified.

The projected population living in private households is determined from the full projected population adjusted for the projected number of people living in communal establishments (such as care homes or the prison). This is assumed to remain a constant number for the under 75 years, and a constant proportion of the 75 years and over population.

This household projection method assumes that changes in household formation for households seen from 2011 and 2021 will continue, which may not necessarily be the case (see Section 3). However, the methodology provides a more detailed picture of future household numbers by household size than simply projecting the change in average household size and applying this to the population projections.

[1] In this case the head of household was identified using the 'first on form' method where the person who filled in the census form for the household was categorised as the 'head of their household'.

2.3 Housing needs projections

The housing needs projections build upon the above housing projections. They use additional information from the 2021 Census that identifies the relationship between different accommodation types (size and type) and the characteristics of the heads of household groups used in the household projections.

The household / head of household characteristics used are summarised below:

Table 1: Household and head of household characteristics used in housing projections

Sex	Age	Household type they live in	Residential status
Male	16-29	Single adult	Qualified (Entitled, Licensed, and 50% of Entitled for work*)
Female	30-44	Two adults	Non-qualified (Registered and 50% of Entitled for work*)
	45-59	One adult & one child	
	60-74	Three or more adults	
	75+	One adult & two or more children	
		Two adults & one or more children	

*analysis of the 2021 Census identified that around half of people with Entitled for work status were living in qualified housing (as a spouse of a qualified person), and half were living in non-qualified housing.

For each unique household type, the proportions that reside in different accommodation types and residential statuses are then obtained from the 2021 Census. The different housing types used are summarised below:

- Flat, 1-bed
- Flat, 2-bed
- Flat, 3+ bed
- House, 1-bed
- House, 2-bed
- House, 3-bed
- House, 4-bed
- House, 5+ bed

Each projected household is then assumed to require one unit of accommodation, and these are proportioned based on these ratios. The difference in the projected number of each housing type compared to the starting point at the beginning of the projections then gives the final assessment of housing need.

2.4 Net migration scenarios

Net migration is the number of people immigrating to live in Jersey minus the number emigrating from Jersey. Annual net migration has averaged:

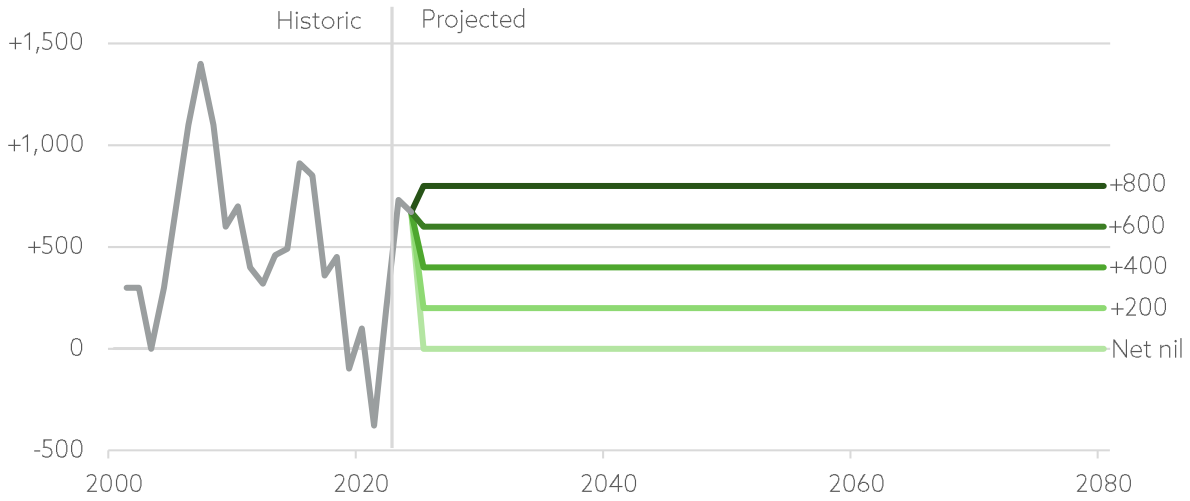
- +530 over the last 3 years
- +260 over the last 5 years
- +380 over the last 10 years
- +550 over the last 20 years

The following net migration scenarios have been chosen based on recent trends and their utility for decision-making. The mid-range assumption is +400. The four alternative assumptions are evenly spaced around the mid-range assumption, in intervals of ±200.

Table 2: The range of migration scenarios

Net migration scenario
Net nil
+200
+400
+600
+800

Figure 2: Net migration, historic, and the different assumptions



2.5 Emigration scenarios

For the projections, emigration probabilities were calculated using a logistic regression model based on data recorded between 2017 and 2023 for the administrative data-based population estimates. Emigration data for the year 2024 was not included in the regression model because this data is provisional and subject to a wider degree of uncertainty.

Analysis of the data found that the preferred model used age, residential status, the number of years someone has been continuously resident in Jersey, and interaction terms between these variables as the best predictors of whether someone would emigrate.

2.6 Immigration scenarios

The methodology used in this report produces a range of net migration scenarios. These are produced by first establishing the level of outward migration for each individual year being considered and then setting the level of immigration to achieve that scenario's level of net migration.

The age, sex, and residential status characteristics of the inward migrants is estimated based on the actual numbers of inward migrants that have been recorded between 2017 and 2023 for the administrative data-based population estimates. Immigration data for the year 2024 was not included because this data is provisional and subject to a wider degree of uncertainty.

2.6.1 Fixed and variable immigration

Immigration data is separated in the modelling into two categories: fixed and variable immigration.

Fixed immigration is that which tends not to vary when total levels of immigration are varying and is projected at a constant level year-on-year for the projections. For example, this includes previously resident Islanders with Entitled status moving back to Jersey, or spouses and children joining Islanders with Entitled status. These spouses or children will usually have Entitled for work status or no residential status if they are under 16.

Variable immigration is all other immigration and is varied year-on-year to achieve the required levels of net migration for a given scenario. For example, people moving to Jersey with Registered or Licensed status, or spouses or children of people without Entitled status. Spouses will usually have Entitled for work status if they are joining a spouse or parent with Licensed status. The annual amount of such people moving to Jersey is highly dependent on the total levels of immigration.

The level of fixed immigration to use in the projections is calculated by taking the average annual number immigrating to Jersey between 2017 and 2023 with Entitled status, and half the number with Entitled for work status and under 16. This amount of immigration is added in every year of the projections, regardless of a scenario's level of net migration.

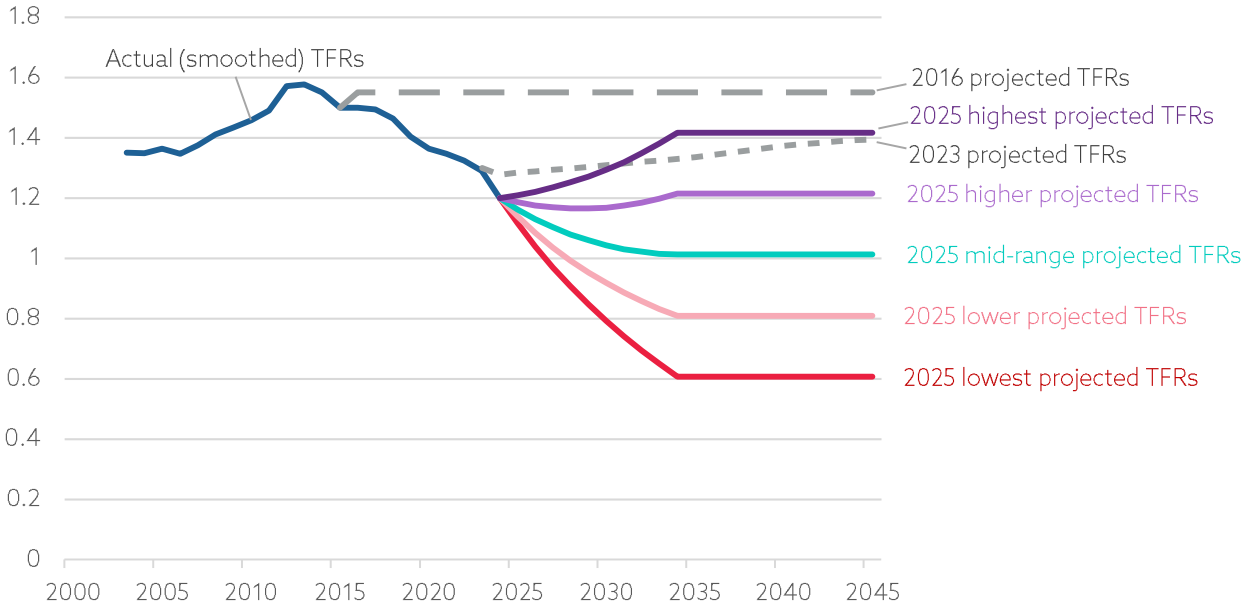
The remaining immigration required to achieve each scenario's level of net migration is then attributed to Licensed, Registered, and the other half of those with Entitled for work status and aged under 16, in the same proportion as was seen, on average, between 2017 and 2023.

The age distributions of fixed immigration levels and variable immigration proportions were smoothed using LOESS (Locally Estimated Scatterplot Smoothing) regression to reduce variability due to randomness in the historic immigration.

2.7 Fertility assumptions

The mid-range fertility assumption in the previous projections was based on the ONS' UK fertility projections. This source projected that the fertility rate in the UK would steadily increase. In contrast, the fertility rates in Jersey are lower than in the UK and have continued to decline since the previous projections report, which applied the UK projected trend to the Jersey fertility baseline rates (see Figure 3). This continuing trend, together with consultation with stakeholders prompted a review of past fertility assumptions, and the development of a new mid-range assumption following the Jersey most recent 10-year trend, with upper and lower variants.

Figure 3: Actual versus historic, past and the current projected fertility assumptions



The fertility assumptions are summarised below using the period total fertility rate (TFR): the expected number of children a woman would have in her life if she experienced that year's age-specific fertility rates throughout her childbearing years.

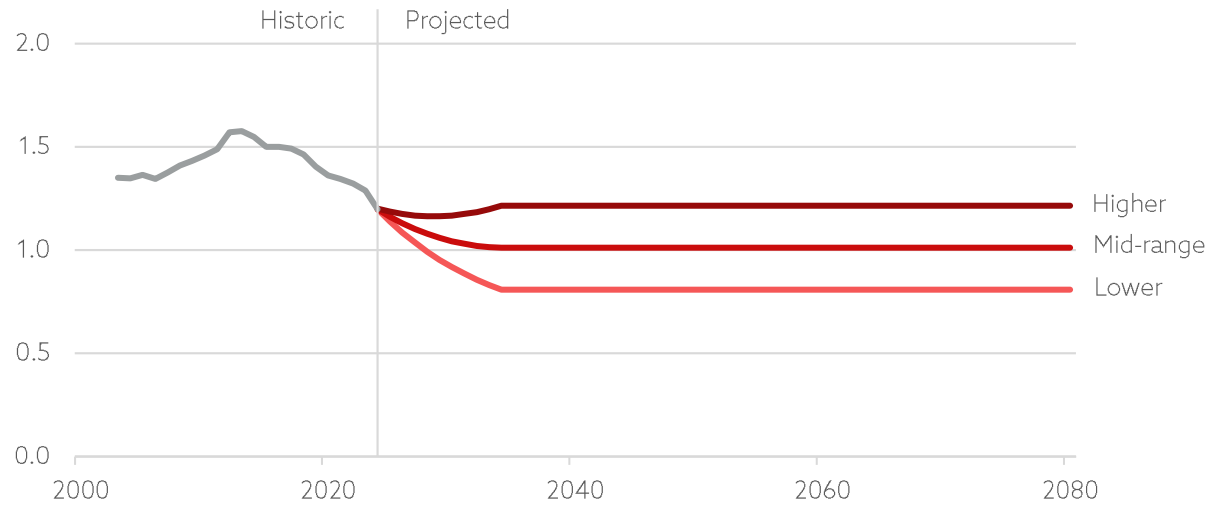
The TFR in Jersey was 1.20 children per woman in the period 2022-2024, among the lowest in Europe, and has been decreasing since 2011-13. The mid-range assumption is that this downward trend will continue in the short term, stabilising at a constant 1.01 children per women 10 years after the projection base year (by 2034). The lower and higher alternative assumptions are 20% lower or higher, with total fertility rates stabilising at constant values of 0.81 and 1.21 by 2034, respectively.

Table 3: The mid-range and alternative fertility assumptions

Fertility (TFR)	Comment
0.81 from 2034 (lower)	20% lower than mid-range assumption*
1.01 from 2034 (mid-range)	Most reflective of recent 10-year trend
1.21 from 2034 (higher)	20% higher than mid-range assumption*

*Difference increases or decreases over time, reaching maximum percentage difference of ±20% in 2034 (10 years).

Figure 4: Total fertility rate, historic, and under the different fertility assumptions



Source for historic total fertility rates: Public Health Intelligence

The mid-range assumption was produced by modelling current age-specific fertility rates using data from 2022 to 2024 and a LOESS regression to reduce variability due to randomness. Separately, the annual changes in age-specific rates between 2014 and 2024 were modelled using a log-linear regression model. These average annual changes were applied to the current rates to project age-specific fertility rates forwards. The amount of annual change was reduced by 10% each year after the start of the projection period, reaching constant levels from 2034.

The alternative scenarios were produced by applying percentage differences to the mid-range assumption. These differences increase or decrease over time, reaching the maximum difference of ±20% in 2034 (after 10 years).

To provide users with a wider range of assumptions, two more alternative scenarios (±40%) are available in the projections data explorer and Open Data, see Figure 3.

2.8 Life expectancy assumptions

The projected number of deaths in Jersey each year are based on assumptions of mortality rates, applied to the projected number of people by age and sex. The mortality assumptions are based on Jersey's recent rates, projected forwards using trends seen in the UK projections (produced by the ONS), of age-specific mortality rates (the expected number of deaths per year per male or female population of different ages).

The mortality assumptions are summarised below using the period life expectancy at birth: the expected lifespan of a person if they experienced that year's age-specific mortality rates throughout their life.

Life expectancy in Jersey was 83.2 years during the period 2022-2024, among the highest in Europe. Between 2000-2002 and 2013-2015 this increased by an average of 0.3 per year. Between 2013-2015, and 2022-2024 this increase slowed to less than 0.1 per year on average.

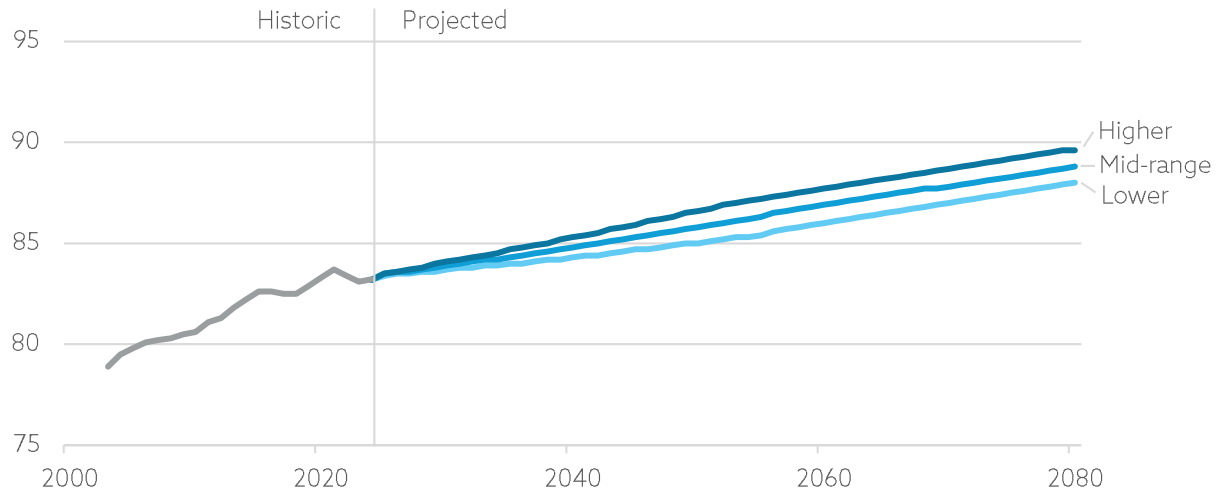
Nonetheless, life expectancy in Jersey is projected to continue increasing in the long term, with the mid-range assumption rising to 86.2 over the first 30 years of the projection period (by 2054). This corresponds to average increases of 0.1 years of life per year. The lower and higher alternative assumptions apply 10% lower or higher mortality rates, with life expectancies of 85.3 and 87.1 by 2054, respectively.

Table 4: The mid-range and alternative life expectancy assumptions

Life expectancy	Comment
85.3 by 2054 (lower)	10% higher than mid-range assumption*
86.2 by 2054 (mid-range)	Most reflective of UK projected trends
87.1 by 2054 (higher)	10% lower than mid-range assumption*

*Higher/lower age-specific mortality rates. Difference increases or decreases over time, reaching maximum percentage of ±10% over the 30 years after projections base year (by 2054).

Figure 5: Life expectancy, historic, and under the different assumptions



Source for historic life expectancy: Public Health Intelligence

Jersey's current age-specific mortality rates (2022 to 2024) were first modelled using LOESS regression. Projected rates for the UK (from the ONS) were then used to project Jersey's current rates forwards by applying the projected odds ratios by single-year-of-age.

Two further alternative scenarios (±20%) are available in the projections data explorer and Open Data.

3 Future Improvements

The availability of more frequent and granular statistics on Jersey's population and migration provides an opportunity for increased evaluation of the projections. During the work to produce the 2025 population and household projections, two areas were particularly noted as key future improvements, based on this evaluation:

1. Improving the modelling of emigration probabilities. In the 2025 projections, a logistic regression was used to incorporate a number of characteristics (single year of age, sex, number of years of residency and residential and employment status) into the model of emigration probabilities. Evaluation of the outcome of the modelling, compared to reality, for the most recent two years, indicated that the model underestimated the outward migration of 16- to 29-year-olds, and overestimated the outward migration of 30- to 59-year-olds. This impacted on the projected number of older ages in the population projections, and also the projected numbers of households in the household projections (because 16- to 29-year-olds are more likely to be living in a household headed up by someone else, whereas 30- to 59-year-olds are more likely to be a 'head' of their own household).

2. The household projections are based on the projected population (both size and characteristics) combined with 'headship rates'. Headship rates are the proportions of each age and sex group that were recorded as the 'head' of a household in the census. Adding up the number of 'heads of household' gives the number of households. Headship rates change over time, but are currently only available from the censuses. Therefore, projected change in headship rates is calculated using data from the 2011 and 2021 census. The 2021 census took place during a time when migration and household patterns were disrupted by the Covid-19 pandemic. A future improvement to household projections is to access a more up to date and regularly available source of household data in order to calculate and project headship rates, so that they no longer rely on household formation behaviour at the time of the decennial census.