

Merseyside Jewish Community ***Demographics***

Population Projection Technical Report - November 2022 (release 1.0)

1 Introduction

The principal reason for conducting the Community Census 2021 and other demographic analysis is to assist community organisations to plan for the future, by assessing the likely size and shape of Our Community in years to come.

The population of a community changes over time due to births, deaths, people moving away (out-migration) and people moving into the area (in-migration). Population projections assess how fertility, mortality, and migratory pressures impact on each age group. The approach relies on there being an estimate of the numbers of males and females in each age band in a starting year (in our case, 2021, based on our Community Census); developing fertility or birth rates for women of child-bearing age groups, and mortality or survival rates for men and women by age; and accessing sufficient additional information to allow the impact of in-migration and out-migration to be assessed.

In simple terms, based on the findings of our Census, these changes may be summarised as:

- How many babies will be born?
- How many of our young adults (generally 18 to 25 year olds) will move away from the area for educational, employment, or other reasons and not return?
- How many adults (generally 25 to 49 years olds) will move into the area primarily for employment reasons?
- How many of our households will move away during their working lives because of opportunities elsewhere or (for those not brought up locally) to move closer to elderly parents or other family?
- How many of our adults will move away at or beyond the end of their working lives to live near their children?
- How many of our parents, currently living elsewhere, may move here, primarily after retirement, to live near us?
- At what age are we likely to die?

By answering these questions, a 'model' to predict the future size and shape of Our Community can be built. Below, we set out relevant information we can glean from our Community Census 2021 and other sources.

1.1 How many babies are born?

Conventional demographic studies would assess likely birth numbers by utilising Age Specific Fertility Rates (ASFRs), calculated by comparing the number of births occurring with the numbers of women in five-year age bands (typically 15-19, 20-24, and so on, usually up to 45-49). The number of births in our community is far too low to allow such an assessment to be carried out, so an alternative approach is needed. Analysis of our census returns indicates that, in the last decade, 80% of children in Our Community were born when their mothers were aged between 28 and 40 inclusive. If we look at respondents to the census (that is, NOT the whole community), we find that the number of 0 to 9 year olds (ie, children born in the last 10 years) sums to 63 – that is, on average 6.3 per annum and, over the last ten years, the number of women aged 28 to 40 has averaged 39.6. Comparing these figures allows us to conclude that, on average, the number of children born each year in the last decade is equivalent to 16% of the number of women aged 28 to 40. Note that

the equivalent analysis conducted on the results of our 2011 census produced a figure of 14% to 18% of the number of women aged 27 to 38 living in Our Community, for the previous decade. The birth rate derived from our 2021 community census is thus within the range derived from our earlier census.

Across England and Wales as a whole, during the last 10 years, 105 boys have been born for each 100 girls (Source: ONS: Birth summary tables, England and Wales, 2020, Table 1) – that is, more boys are born than girls. Our census sample of 63 0 to 9 year olds is heavily skewed in favour of boys. However, the number of births in the community as a whole (about 17 per year in the last decade) is too small to warrant detailed consideration of gender balance.

1.2 How many of our young adults have been moving away?

The Community Census 2021 indicates that the proportion of our adult children who move away from the area by the time they reach the 25+ age band is around 57%. This is well below the equivalent figure found in our 2011 census – which was 75%. It may be that recent economic/Covid issues have made it difficult for the current generation to leave the parental home or move away from the Merseyside area, and that a figure of 75% (as found for older age bands in our 2021 census) will not be achieved until a slightly later stage in their lives.

1.3 How many adults have been moving into the area?

Analysis of our 2021 census shows that, in the last decade, 50 census respondents had moved here from outside of the area. Their primary reason for moving to Merseyside is for employment reasons, rather than because a person met and married someone from the area (the main reason in earlier periods). That analysis also demonstrated that recent arrivals constitute a material proportion of the total number of 30 to 49 year olds in the community as a whole (about half of 30 to 39 year olds, and a quarter of 40 to 49 year olds). In absolute numbers, expanding our census responses indicates the arrival of about nine 30 to 49 year olds per annum during the 2010s. This is somewhat higher than the figure of four young adult arrivals per annum in the 2000s, based on our 2011 census. (Note that section 6.3 of the Community Census 2021 Analysis and Results Technical Report, available at repcouncil.co.uk, provides a more detailed analysis of in-migration).

As job opportunities are now the largest driver of in-migration, whether future levels of in-migration mimic those achieved in recent years will be dependent on the performance of the economy and employment market both locally and nationally. Given the impact of the Covid pandemic and current economic uncertainties, caution is needed in simply applying past experience to future projections. It should also be noted that the in-migration of working age adults is focused on Liverpool. The number of census respondents moving into the Wirral, Chester, and Southport areas in the last ten years is too small for meaningful analysis to be carried out.

In addition to younger adults moving to the area, a second potential source of in-migration is the movement of out-of-town parents to live closer to their Merseyside children, at or after retirement. However, analysis of our 2021 census indicates that the numbers are too small to warrant specific consideration in a forecasting model.

1.4 Will we still live here in 10 years' time?

Families who have already moved away could not, of course, feature in our census, so we have little objective data to base an assessment of future out-migration of working age and pensioner households. So, in order to provide some indication of the level of out-migration, one of the 2021 community census questions asked respondents to state whether they

expect to move away from the Merseyside area in the next 10 years, and if so to where, and why.

A full analysis of the responses is provided in Section 6.4 of the Community Census 2021 Analysis and Results Technical Report, accessible via repcouncil.co.uk. In summary, the likelihood of moving away reduces with age – from around one in four of under-45 year old adults predicting that they will move away from the area in the next decade, to one in fifty of those aged 85 or more. As might be expected, for those aged 60 or more, the dominant reason for moving is to move closer to children, and for under 60s, the leading driver is to move closer to parents and family living elsewhere.

Overall, the census analysis points to about 2% of under-45 year olds (and their children) moving away per annum, together with about 1% of 45 to 84 year olds. As regards the destination of the move, about 15% indicated that the Manchester area would be their new home; 45% would be bound for the London area; and about 20% to Israel, and 20% to a variety of other (mainly overseas) locations.

1.5 How long do we live?

Information on deaths is derived from the community’s annual demographics report rather than from the community census. To assist with understanding this last piece of the demographic jigsaw, the table below summarises death rates by age band and gender for our community, derived from the community deaths data and the population estimate produced from the community census, together with comparative figures for England and Wales as a whole. The table shows that members of Our Community tend to live (on average) a few years longer than the public at large (compare the mean or median ages at death) and thus demonstrate slightly lower death rates at each age.

Death rates 2012-2021

age band	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95+	Age at death	
									mean	median
Our Community (%age of people dying per annum in age band)										
men	0	1	1	2	4	9	18	44	84	86
women	1	1	1	2	2	6	18	22	85	89
both	1	1	1	2	3	8	18	27		
England and Wales (%age of people dying per annum in age band)										
men	1	1	2	4	7	13	24		76	79
women	1	1	2	3	5	10	21		81	84
both	1	1	2	3	6	11	22			

Source of England & W data: ONS: Deaths registered in England and Wales 2020 - various tables:
 death rates are average over 2011 to 2020 period (from Table 3)
 mean ages are for 2020 (from Table 12)
 median ages are for 2020 (from Tables 4 and 5)

2 The Projection model

Based on the information set out above, we can develop a set of ‘rules’ that can be built into a projection model. The analysis presented above is largely based on the analysis of our Community Census 2021. Clearly, we cannot be sure that the underlying determinants of childbearing and migration and, indeed, death rates that applied in the 2010s will continue to apply in the 2020s and 2030s. Similarly, much of the analysis is based only on a selection of our community – those who responded to the census (albeit adjusted to minimise any

bias in the sample). Thus, as well as a ‘central’ forecast, a ‘low-high’ range has been built into the model to give an indication of the sensitivity of the projection to some variation in the underlying assumptions; this should NOT be considered as a statistically-based confidence interval.

The ‘rules’ or assumptions built into the model are thus as follows:

Rule 1 – the number of births (persons aged 0) in year n+1 shall be **0.16** times the number of women aged 28 to 40 inclusive in year n; half the births will be assumed to be boys, and half, girls. (‘low-high’ range: 0.148 to 0.172)

Rule 2 – the number of persons aged x+1 in year n+1 shall be the number of persons aged x in year n, subject to a number of adjustments.

Rule 3 – for persons aged 60 and over in year n, the number of persons aged x will be reduced by the following factors to allow for deaths, with the remainder representing the number aged x+1 in year n+1:

Age	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100+
Men	0%	1%	1%	2%	4%	9%	18%	44%	60%
Women	1%	1%	1%	2%	2%	6%	18%	22%	50%

(‘low-high’ range: 1.1 to 0.9 times these rates)

Rule 4 – the number of 23 year olds in year n+1 shall be **0.43** times the number of 22 year olds in year n, representing out-migration of our young adults. (‘low-high’ range: 0.30 to 0.50).

Rule 5 – Each year, **3** persons in their thirties and **2** in their forties will be added (representing in-migration of young adults (aged 30 to 49) primarily for employment reasons). (‘low-high’ range: 1 (30s) and 1 (40s), to 5 (30s) and 4 (40s)). *Note that as the figures derived from our 2021 census were materially in excess of those from our 2011 census, and that the Covid pandemic and continuing economic uncertainty may well dampen future in-migration for employment reasons, the figures derived from our 2021 census have been used for the ‘high’ end of the ‘low-high’ range, with a rate close to the 2011 census outputs used for the central forecast.*

Rule 6 – The projected number of people aged 25 to 44, and aged 0-9, in year n+1 will be reduced by **2%**, and those aged 45 to 64, and aged 10 to 22 will be reduced by **1%** (representing out migration of households for work, to move to a larger community, to make aliyah, or to return ‘home’). (‘low-high’ range: 2.25% & 1.25%, to 1.75% & 0.75% respectively).

Rule 7 – The projected number of people aged 65 to 84 in year n+1 will be reduced by **1%** in each age (representing out migration around or after retirement, largely to move nearer to children). (‘low-high’ range: 1.25% to 0.75%).

Of course, we need a ‘base’ population to which these rules can be applied. The Community Census 2021 has provided us with a suitable population estimate. The census reports subdivide the population between Greater Liverpool and the Southport area, as shown in the table below.

2021 Base Population (from Community Census 2021)

Age Range (Years)	Estimate for Our Greater Liverpool Community 2021				Estimate for Our Southport Community 2021			
	Male	Female	All People		Male	Female	All People	
0-19	200	150	350	18%	<10	<10	10	5%
20-39	60	140	190	10%	<10	<10	10	5%
40-59	170	210	370	19%	10	20	40	20%
60-69	170	150	320	16%	20	20	40	20%
70-79	220	220	440	22%	30	30	60	30%
80 & +	140	170	310	16%	10	20	30	15%
TOTAL	950	1040	1980	100%	90	100	200	100%
Median Age	64				70			

For the purpose of carrying out the population projection, the Greater Liverpool element has been split between Wirral and Chester on one hand, and the Liverpool area on the other. In addition, although the published census results group the population by 10 or 20 year age bands, these were built up from single year figures. To produce the figures to be used in the model, the single year raw figures from the census have been smoothed, generally by applying a five-year moving average.

Each of the three base year (2021) sub-models (for the Liverpool area, Wirral/Chester, and Southport area, respectively) has had the 'rules' listed above applied to them, noting that 'Rule 5' (in-migration of working age adults) has been applied only to the Liverpool area sub-model. As well as a 'central forecast' model, 'low forecast' and 'high forecast' models have also been built, using the same base population, but with the 'rules' varied as set out above.

3 Model Results – Population by Age

Applying the central, low, and high rules to the 2021 base population (and re-combining the Liverpool area with the Wirral/Chester sub-models) produces population estimates for the Greater Liverpool area for future years. The results of the modelling are summarised in the table below.

The table shows the central forecast in bold figures, with the low-high range in standard text below. As mentioned already, the low-high range demonstrates the sensitivity of the results to small changes in assumptions; it does NOT represent a statistically calculated confidence interval. In addition, it assumes that the 'rules' developed in 2021 remain in force over the next 20 years. In reality, the issues that determine the extent of in- and out-migration may change in that period – for example, improved or worsening economic and employment prospects on Merseyside compared with other parts of the country, or an increase or decrease in desire to move closer to children. The further into the future, the less reliable any projection will become.

The table includes the percentage share of each age group for 2021 and 2041 – showing an expected major fall in the proportion of people in their 70s, and the large increase in the proportion in their 80s and above, within a gradually reducing total population.

Projection for Our Greater Liverpool Community

Age Range (Years)	Central Forecast				
	Low-High Range				
Year	2021	2026	2031	2036	2041
0-19	350 18%	320	260	210	170 16%
		310-330	240-290	180-240	140-220
20-39	190 10%	170	160	160	140 13%
		150-190	140-190	120-190	100-170
40-59	370 19%	310	290	250	190 18%
		300-330	260-320	220-300	150-250
60-69	320 16%	220	160	130	150 14%
		220-230	160-170	130-140	130-160
70-79	440 22%	380	270	180	130 12%
		370-380	260-280	170-190	120-140
80 & +	310 16%	350	390	350	280 26%
		340-370	360-410	320-390	250-310
TOTAL	1980 100%	1760	1530	1290	1060 100%
		1700-1820	1420-1650	1140-1450	890-1260
Median Age	64	64	63	61	61

The table below represents the results of the modelling for the Southport area. As the numbers are much smaller than the Greater Liverpool area, the low-high range for each age group is too narrow to show in the table – only the total figure for each year shows the low-high range as well as the central forecast.

Projection for Our Southport Community

Age Range (Years)	Central Forecast				
	Low-High Range				
Year	2021	2026	2031	2036	2041
0-39	20	15	10	10	10
40-59	40	30	20	15	5
60-69	40	20	20	10	10
70-79	60	60	30	15	15
80 & +	40	40	50	55	40
TOTAL	200	160	130	100	80
low-high		160-170	120-135	90-110	70-85
Median Age	70	72	77	80	79

All the 'warnings' that have been mentioned in connection with the Greater Liverpool forecast apply even more strongly to the Southport forecast. This is because the overall numbers are much smaller – and therefore the number of census respondents that the underlying analysis is based on is quite small, and may not fully represent the overall age structure of the current Southport community, necessitating the 'borrowing' of some Liverpool data in developing the Southport model. The modelling for Southport shows a continuation of the quite rapid contraction of the Jewish population, and an expectation that the over 80s proportion of the population will increase to 50%. This is likely to increase the

likelihood that assumptions developed in 2021 will change in the future. A particular issue (see the next section) is the future viability of both Southport congregations. Should one or both be forced to close in the time period covered by the population forecast, that could have a major impact on the rate of out-migration from the area.

From a community perspective, the consequences of the population projection on and for services provided in and by the community are more important than the forecasts themselves. These are considered in the next section.

4 Model Results – Consequences for Community Service provision

The detail contained within the projection model allows some indications to be given of the likely impact on demand for community services brought about by changes in the age profile and size of our community. The table below gives a flavour of how the level of demand for various services might change over the next 20 years. In some cases (King David school pupil and shul membership numbers), the table shows an absolute numerical estimate or range. For other matters, the table shows a likely level of demand compared with the level in 2021, which represents 100%.

		Projected Demand for Services				
		Low-High range				
Service		Absolute numbers or comparison with 2021				
	Year	2021	2026	2031	2036	2041
KDPS pupils		99	75-80	65-80	45-70	30-55
KDHS pupils		80	85-90	75-80	55-65	45-65
Youth activities (Liverpool)		100%	95%-100%	70%-80%	60%-75%	40%-65%
Liverpool Shul members		1114	940-1000	770-880	600-750	470-650
Southport Shul members		120	95-100	75-85	55-65	35-45
Welfare services (Liverpool)		100%	105%-110%	100%-110%	80%-95%	60%-75%
Community funders (L'pool)		100%	80%-90%	65%-80%	50%-75%	45%-70%
Welfare services (Southport)		100%	120%-125%	125%-135%	90%-110%	70%-85%
Community funders (S'port)		100%	75%-80%	50%-55%	40%-45%	35%-45%
Residential Care places		100%	95%-105%	95%-110%	90%-115%	80%-105%
Cumulative Orthodox burial plot demand (Liverpool)		-	170-210	370-410	570-610	760-800

For clarity, the school pupil and shul member estimates are calculated based on those categories representing a particular proportion of school-age children in Liverpool, and an adult age range in Liverpool and Southport respectively. The demand for youth activities is based on change in the number of 8 to 16 year olds; welfare demand is assumed to vary in line with the number of people aged over 75; residential care place demand is based on assuming that the proportion of people in the oldest age groups who choose to live in Stapely and the Southport Rest Home remains constant into the future.

The 'community funders' entries are intended to highlight the extent of potential difficulty in funding future welfare needs. The table indicates that (particularly in Southport) that the demand for welfare help is likely to increase in the next ten years before falling back. However, the population available to fund this essential work is likely fall quite rapidly, (again particularly in Southport) raising the question of the financial viability of care services.

(Whilst it is clearly a significant over-simplification, the change in community funders is assumed to vary in line with the number of 30 to 64 year olds in the community).

All the caveats that apply to the population projections themselves apply even more strongly to these estimates of service demand. This is because only demographic changes have been allowed for in developing these estimates. However, each of these services has a range of other factors that influence the level of demand. For example: the proportion of Liverpool Jewish children who attend the King David schools may be influenced by the proportion of pupils who are Jewish, the extent of Jewish education, and the view parents take of competing schools; the demand for residential care will depend on the availability and quality of, and degree of preference for, at-home or live-in care, and the degree to which other family members live near-by; burial plot numbers will be influenced by the extent to which those who have already moved away (or do so in the future) choose to be returned to Merseyside for burial, which is likely to be influenced by the presence or absence of family still living in the area.

It is thus important that the values in the table should be viewed as providing an indication of what might arise in the future, due to demographic change, and should be only one of the factors that those responsible for providing community services should take into account when looking to the future.

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