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Assessing the Current Demography and Future Shape of a Minority Sub-Population: the Case of Liverpool UK Jewry

Philip Sapiro[1]

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Abstract
The paper sets out how a small religion-based sub-population based in a UK city, Liverpool Jewry, underpinned its planning for the future in the light of its reducing size and the consequent strain on the community's infrastructure and resources. This was achieved by carrying out a voluntary census to provide information on the community's current size (about 1800 individuals living in 900 households) and its age profile, household types and other characteristics. The census questions were designed to provide data that allowed future population projections to be developed. The low number of births in the community necessitated the devising of a novel approach to the fertility assessment, though mortality rates were derived in a traditional way. In particular, the various elements of migration were investigated via historical information and stated preference responses. The analysis facilitated the estimation of levels of future demand for educational, youth, cultural, religious, welfare and burial services, and the community's ability to continue to provide those services. Whilst the subject of this paper is the Jewish community in the city of Liverpool, the approach set out here could be adopted by other minority groups, whether shrinking, growing or stable, in other localities and in other countries.

Keywords Census · Demography · Population projection · Minorities · Jewish · Liverpool

Introduction

This paper sets out how a small religion-based sub-population, based in a UK city, underpinned its planning for the future in the light of its reducing size and the consequent strain on the community's infrastructure and resources. This was achieved

✉ Philip Sapiro
psapiro@liv.ac.uk; philsapiro@aol.com

[1] Department of Geography and Planning, Roxby Building, University of Liverpool, Liverpool L69 7ZT, UK

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by carrying out a voluntary census to provide information on the community's current size and shape and its demographic characteristics. The census questions were designed to provide data that allowed future population projections to be developed. The responses facilitated the estimation of levels of future demand for educational, youth, cultural, religious, welfare and burial services, and the community's ability to continue to provide those services. Whilst the subject of this paper is the Jewish community in the city of Liverpool, the approach set out here could be adopted by other minority groups, whether shrinking, growing or stable, in other localities and in other countries. For an international perspective on Jewish community population studies, see Sheskin (2016) and Ukeles (2016).

Background

The City of Liverpool is an important UK commercial centre and port located at the mouth of the River Mersey, about 300 km north-west of London. It is the focal point of the Merseyside area – a metropolitan conurbation with a population of about 1.5 million people. For centuries Liverpool was a small town until around 1700, when its population was about 5000 (Butterworth 1841). The development of the town as a port, brought about through the conversion of the Pool of Liverpool into a wet dock in 1708, led to the development of international trade (Aughton 1990). The population of Liverpool doubled every 20–30 years throughout the eighteenth century, driven primarily by in-migration (Butterworth 1841). The Industrial Revolution continued the town's growth, focussed on the port, on import and export businesses, and as a major center for banking, insurance and other finance sector employment, serving the major industrial centres of Lancashire and other parts of northern England (Aughton 1990). Indeed, Liverpool was the most populous provincial Borough in England for the whole of the nineteenth century, and of major importance to the commercial success of the British Empire (Littlefield 2009; Thompson and MacKenzie 2008).

The development of the Liverpool Jewish community paralleled that of the town itself. The founding of a synagogue in Liverpool in the 1740s meant that Liverpool was in the first wave of provincial Jewish communities, and uniquely located in the north of England (Endelman 2017). The 1805–1816 Register of the Jews of Liverpool,[1] which lists only those individuals wealthy enough to afford a subscription to the synagogue, records 350 individuals in 70 households, suggesting that Liverpool was the largest provincial community by the start of the nineteenth century. Both Endelman (2017) and Lipman (1951) conclude that Liverpool was the largest provincial community in 1851, so it likely that the town was home to the largest Jewish community outside of London for at least the first half of the nineteenth century.

By the end of the twentieth century it had fallen well behind the Manchester area (22,000) and Leeds (8000) as regards the population of English provincial Jewish

[1] Manuscript, prepared by the Liverpool Jewish community *c*. 1816, now held in the Liverpool Record Office in the Central Library, Liverpool, UK.

communities; however, it remained one of five communities with a population of between 2500 and 3500, together with Brighton, Southend, Bournemouth and Birmingham. All of these aforementioned communities, with the exception of the Manchester area, have contracted by between a fifth and a third in the first two decades of the twenty-first century (Sapiro 2023), due to out-migration and an excess of deaths over births.

In the face of such a high rate of contraction, it is not surprising that it becomes more and more difficult to maintain the infrastructure of a community. A proper understanding of the demography of the Jewish population and how the size and shape of the community may change in the future increases in importance, if community organizations are to plan sensibly for the future. Outputs from the England and Wales censuses can provide some useful information to assist with this, but the national censuses are not specifically tailored to address the scale of future needs, or the ability of communities to meet those needs.

The Merseyside Jewish Representative Council (MJRC) is the umbrella organization for the Jewish community in Liverpool and surrounding areas. It has carried out a voluntary census of the community in 2011 and 2021 (following a pilot in 2006) to provide a broader range of information to allow community organizations to plan for the future – by providing a snapshot of the community in 2021, and developing estimates of rates of fertility, mortality and migration to allow future population projections to be made. This paper describes the conduct of the census and presents analysis of the returns, as well as subsequent future projection development. It combines the information with data extracted from the published outputs from the Office for National Statistics (ONS) England and Wales (E&W) census of 2021 to provide a comprehensive picture of the Liverpool Jewish community. Note that although the MJRC census covered the wider Merseyside area, the analysis presented here focusses on the City of Liverpool, where the overwhelming majority of community members are to be found.

Superficially, this study might be thought of as an extension of a series of population studies of provincial Jewish communities in England, following on from studies of Sheffield (Kosmin et al. 1976); Leeds (Freedman 1988; Waterman 2003); and Broughton Park, Salford (Vulkan and Graham 2008). Each of those studies developed its own methodology, but the current study is ground-breaking in that it has deliberately set out to gather sufficient information to allow for future levels of migration to be estimated, population projections to be made and to assess the likely impact on the community of those changes, in an objective way.

Jewish Community and Population Study Context

The importance of carrying out demographic studies, and comprehensively understanding both the changes that are occurring in a population and the causes of these changes, assessed in an objective and forward-looking way, if planning for the future can be successfully achieved, has been very amply expressed by the European Jewish Demography Unit (Staetsky and DellaPergola 2019). Although the report relates

to Europe as a whole and each country within that continent, the message applies equally to individual communities.

The current study needs to be viewed within the context of Jewish population studies more generally. The most extensive examinations of Jewish numbers have focussed on the USA – home to by far the largest Jewish population outside of Israel (DellaPergola 2023b). The latest major study is that carried out by the Pew Research Center in 2020 (Pew Research Center 2021). As with all studies which produce estimates of Jewish population, the authors needed to wrestle with the question, who should be counted as Jewish? This aspect of Jewish demographic studies has become more critical during the course of the twentieth and twenty-first centuries with an increasing secularization of society in general (see, for example, Wilson 2004; Turner 2011); for an in depth perspective on how Jews do and have seen themselves, see Kosmin (2022). Clearly, there is no absolute answer to this question – it depends on the purpose for which the survey/study is being carried out – as can be vouched for by the number of papers which have reviewed the Pew Center's approach, which sub-divided the population under scrutiny between Jews by religion and Jews of no religion (see, for example, Tighe et al. 2023; DellaPergola 2023a).

Insofar as the European sphere is concerned, detailed population studies are yet to reach the level of maturity that have been developed in the USA. Indeed, one of the aims of the European Jewish Demography unit, set up in 2019 within the London-based Institute for Jewish Policy Research, is to raise the status and quality of European research (Staetsky and DellaPergola 2019). As a starting point, an overview report, pulling together current and historic population and attitudinal information at a country level from a number of sources, has been produced (DellaPergola and Staetsky 2020). One interesting finding from that report is that a far greater proportion of UK Jewry, compared with other countries, see their Jewishness as a matter of religion, rather than, for example, ethnicity or culture. That report also indicates that the Jewish population in the UK has been contracting at a faster rate since 1970 than any other western European nation. This initial report was followed by a more detailed pan-European report looking at Jewish identities (DellaPergola and Staetsky 2021) using data from 'the second survey on discrimination and hate crime against Jews in the EU' (EU 2018). More recently, the demography unit has published reports on the demographic and socio-economic analyses of Austrian and Belgian Jewry (Staetsky and DellaPergola 2020, 2022) on the basis of information from the same EU study, other administrative datasets, records and information collected by the local Jewish communities, national census data (in the case of Austria) and synagogue membership numbers (for Antwerp and Brussels in the case of Belgium). The collection of synagogue membership information mirrored that already carried out in the UK (see, for example, Casale Mashiah and Boyd 2017). In the study reported in the current paper, 2021 synagogue membership information for the Liverpool and Southport synagogues has been used as part of the validation process, and national census data have been used to complement the study findings.

Twentieth-century assessments of the Jewish population of the UK were primarily based on assessments which extrapolated from death and burial data – the only reasonably comprehensive information available within the community (Rosenbaum 1905; Trachtenberg 1933; Prais and Schmool 1968; Haberman and Schmool 1995).

These estimates implicitly defined a Jew as a person who would choose to be buried in a Jewish cemetery. However, the decision to include a question about religion in the UK national censuses of 2001 (and subsequently 2011 and 2021) has completely changed the UK approach. The London-based Institute for Jewish Policy Research has taken the lead in disseminating and interpreting the census tabulations of results for persons who ticked the "Jewish" box on the census form religion question (Graham et al. 2007, 2012; Graham 2013a, b, c; Graham and Boyd 2024). Sapiro (2023) provides a complementary analysis of England and Wales Jewry, community by community (rather than by local government unit or electoral ward) covering all three twenty-first century England and Wales national censuses. However, this apparently comprehensive data source (completion of the census return is mandatory) has merely re-opened the debate as to who should be counted. Completing the religion question was voluntary (so how many Jews were amongst the 6–7% of people who chose not to answer the question?), and what about individuals who see their Jewishness as a secular matter of ethnic/cultural/heritage significance rather than a religion and thus ticked the 'No religion' answer to the religion question (Graham and Waterman 2005)? Indeed, the view that being Jewish has a race/ethnicity element to it rather than solely a question of religious belief has been accepted in English law (Cohn-Sherbok 2016; Klaff 2023).

The purpose of the study presented in this paper was to enable community organizations to plan for the future. The population of interest, therefore, are persons likely to avail themselves of the services of the community at some point in their lifetime in the Liverpool area. Issues of how individuals view their Jewishness, the extent to which Jewish religious authorities consider them to be Jewish, or which box was ticked in the national censuses are thus irrelevant to this study. How the survey sample was constructed is discussed shortly, but if it led to people who consider themselves to be Jewish, but have no intention of using the community's facilities, being omitted, then this should be regarded as a positive, rather than a weakness in the approach.

There are no comprehensive central registries of Jewish individuals in the UK, so any survey or census that seeks to find factual or attitudinal information about Jewish people must be based on only a sample of the population. Care must be taken in selecting the interview sample, so that the extent of any bias can be assessed, and potential distortion in the results understood. Marker (2016) provides an overview of current thinking on the quality of Jewish surveys based on different sampling techniques (albeit in an American context, and recognizing the high costs involved). It is clear that developing samples via random digit dialing (RDD) has previously been seen as the most statistically sound approach to avoid bias in samples, though the presence of households with only mobile phones with no geographic markers has now rendered this approach less reliable. Marker recommends address-based sampling (using the postal system rather than the telephone system) as an alternative approach. Both of these approaches require considerable financial and human time input, and might be suitable in areas with a high proportion of Jewish residents, but in Liverpool (and almost all of the UK) the density of Jewish households (below 0.5% of the population) – the "rarity" issue – the costs would be disproportionate to any benefit gained. Indeed, Staetsky (2019) confirms that due to the rarity issue, the use of non-probability convenience samples

has become a necessity if UK/European populations are to be studied. His analysis is that convenience samples (e.g. use of membership lists of communal organizations, or snowballing – where prominent members of the community encourage others to take part) are not as statistically reliable as more random sampling approaches. However, he differentiates between population studies (where the aim is to reflect the numbers and views of all Jews, however defined, in an area) and community studies, which are to be used for community planning. Convenience samples will inevitably under-sample persons not strongly attached to the community, but this may be of little significance to the type of study reported on in this paper, and some form of benchmarking is necessary to understand the extent to which there may be bias in the survey results. The Liverpool study used a convenience sample with some benchmark values. On a wider geographic scale, this type of approach has also been satisfactorily used by the Institute for Jewish Policy Research for a number of surveys recently undertaken in the UK (see, for example, Graham and Boyd 2024) and across Europe (DellaPergola and Staetsky 2021).

The next section of the paper describes the MJRC census and the expansion of the surveyed sample to represent the totality of the Liverpool Jewish Community. Following this, the basic demography of the community in 2021, as determined from the census, is set out. This forms the base position from which projections for the future can be explored. Future changes to the population arise from just three elements: births/fertility, deaths/mortality and re-location/migration of people into or out of the area (Holdsworth et al. 2013). Derivation of rates for these parameters are discussed in the subsequent sections of the paper.

The MJRC Census

The MJRC voluntary census remained open for a 2-month period in 2021, and to avoid any confidentiality issues, no full address or name information was requested. The census could be completed on-line and a paper-based version (see Appendix) was also available. The census was publicized via a number of community organisations and newsletters, synagogue and MJRC email and postal lists and in the press. By the end of November 2021, responses had been received from 366 households located within the boundaries of the City of Liverpool, covering 758 Jewish individuals (and about 50 other persons). More than 80% of the forms were completed on-line, and almost all of on-line and paper returns were fully or largely complete – fewer than ten provided only the number of persons in the household. In addition to these replies, 69 responses were received from residents of the local area but beyond the city limits; the analysis of those returns is not included here.

Expansion of the Census Sample to Cover the Community Population

As the MJRC census was voluntary (and therefore only a proportion of the community responded), it was important to ensure that any bias in the sample was assessed and accounted for prior to making use of the results (Stopher 2012). Certain total values for the entire community were known – synagogue membership numbers

Table 1 Comparison of census respondents and known community totals

	Members of Liverpool synagogues (households)	MJRC Year Book recipients in Liverpool (households)	King David Schools pupils (pupils)
Census respondents	328	236	72
Known community total	761	413	179
Proportion taking part	43%	57%	40%

(in various categories), Jewish children at the King David Schools (by year group) and recipients of the MJRC Year Book (by postal district). Questions were included in the MJRC census, asking about these aspects to check for bias and to allow for calculation of expansion factors to project results for the entire community. Table 1 provides a simplified summary of this information.

The conclusion of this process was that the census returns provided a representative sample of about 40% of households and individuals in the Liverpool Jewish community, and that the community in total consisted of around 900 households and about 1800 Jewish individuals in 2021. In the analysis which follows, results are presented for the census sample, and where appropriate, expanded and rounded to provide estimates for the community as a whole (together with 95% confidence intervals for the proportion of the population falling into the categories into which the population has been sub-divided).

The analysis of the MJRC census was completed prior to the release of outputs from the E&W census, thus E&W census data played no part in the expansion of the MJRC census sample to represent the totality of the Liverpool Jewish community. In the following sections some comparison with subsequent outputs from the E&W census[2] are shown. Material differences between the census outputs should not be regarded as suggesting that either census is incorrect, as the two censuses were measuring different populations – the MJRC census sought to identify the numbers of people who might wish to avail themselves of the services of Jewish communal organisations and the E&W census results tabulate individuals who chose to select "Jewish" as their answer to the census voluntary question on religion.[3] The latter will exclude individuals who chose not to respond to the question, but will include individuals who have little or no association with the Jewish community or its organizations.

[2] Data from the E&W 2021 census have been derived from customized datasets created by the author via https://www.ons.gov.uk/datasets/create.

[3] See https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/religion/bulletins/religionenglandandwales/census2021.

Table 2 Age profile by gender

Age range (years)	MJRC census respondents 2021			Projection for Liverpool Jewish community 2021				E&W census Jewish Liverpool	E&W census All religions Liverpool
	Male	Female	Total	Male	Female	Total			
0–9	38	21	59	100	60	160	9% ± 2%	8%	11%
10–19	31	34	65	80	80	160	9% ± 2%	8%	12%
20–29	10	16	26	30	40	70	4% ± 1%	11%	18%
30–39	8	22	30	20	80	110	6% ± 2%	7%	14%
40–49	21	35	56	70	100	160	9% ± 2%	9%	11%
50–59	31	34	65	90	90	180	10% ± 2%	13%	12%
60–69	56	58	114	160	140	300	16% ± 2%	14%	10%
70–79	84	95	179	200	200	400	22% ± 3%	18%	7%
80–89	42	51	93	100	120	220	16% ± 2%	12%	4%
90 & +	8	23	31	20	40	60			
Not stated	17	22	39						
Total	346	411	757	870	950	1810		1800	486,100

The Liverpool Jewish Community in 2021

Age Distribution by Gender

Looking to the future, the most important current demographic characteristic of a population to understand is the age distribution by gender. Table 2 sets out these data for MJRC census respondents; and also expansion of that information to represent the whole community. The table also presents the age profile for Jewish individuals (and all residents) in Liverpool taken from the religion dataset from the E&W census. Both censuses indicate that women and girls make up 52% of the total Jewish population.

People in their 70s are by far the largest age group in the Liverpool community, with relatively few people in the main child-bearing 30–39 age range (see later). This results in the contraction of the community alluded to earlier in this paper. There is a broad convergence between the expanded MJRC and E&W age profiles. The MJRC proportion of 20–29 year olds is, however, markedly lower; this is not at all unexpected. The majority of locally brought-up teenagers leave the area on finishing their secondary education, and most 20–29 year olds are new to the area (see later), arriving as students or to take up professional employment. Generally they do not have school-age children and choose not to come into contact with community organizations – they were thus a "hard to reach" cohort as regards the MJRC census; however, insofar as identifying persons who make use of community services, the proportion is not unrealistic.

Table 3 Household types

Household type	Number or proportion of households				
	MJRC census Respondents	Projection for Liverpool Jewish Community		E&W census Jewish HRPs Liverpool	E&W census All HRPs Liverpool
	2021	2021			
One-person households	100	290	31% ± 5%	44%	37%
Pensioner (age 65 and older)	91	260	28% ± 4%	24%	12%
Other (age 64 and younger)	8	30	3% ± 2%	20%	24%
Age not specified	1				
Couples with no children at home	169	370	41% ± 5%	29%	19%
Pensioner couple (mean age 65 and older)	130	280	31% ± 5%	18%	6%
Other couple (mean age 64 and younger)	35	90	10% ± 3%	11%	13%
Age not specified couple	4				
Couples with child(ren) at home	71	180	21% ± 4%	16%	20%
With one dependent child at home	19	50	6% ± 2%	11%	14%
With two or more dependent children	40	100	12% ± 3%		
With only non-dependent child(ren)	12	30	3% ± 2%	4%	6%
Lone parent with child(ren) at home	14	50	5% ± 2%	6%	15%
With one dependent child at home	3	10	1% ± 1%	2%	9%
With two or more dependent children	6	20	2% ± 1%		
With only non-dependent child(ren)	5	20	2% ± 1%	4%	6%
Other household types	5	20	2% ± 1%	4%	9%
All students, all pensioners, miscellaneous	5	20	2% ± 1%	4%	9%
All households	359	910	100%	900	207,500

HRP household reference person

Living Arrangements/Household Types

Another demographic element, important to organizations which provide welfare and social services to a community, is knowledge about the balance of various household types and living arrangements found. Table 3 sets out this information for those responding to the MJRC census. As with the age profile, the table presents an estimate for the whole community on the basis of an expansion of the MJRC census returns and some data from the 2021 E&W census.

However, it is important to be clear what is being shown here. The MJRC census includes households in which at least one Jewish person resides. The nearest equivalent output from the E&W census are households which have a Jewish household reference person (HRP). ONS selects the most economically active person in a household (ranking people in work above those not in work) as the HRP. Thus in

households (whether they include only one person or a family) where all members are Jewish, the HRP will be Jewish, but in mixed religion households, the HRP will only be Jewish if ONS regards a Jewish person as the most economically active. If a person of a different religion is deemed to be the most economically active, then that household will not be included in the E&W census Jewish HRP tabulation. The 900 households summarized in the E&W Jewish HRP Liverpool column in Table 3 include about 150 mixed religion households, in which 70% of HRPs are male (as men are more likely to be selected as the HRP than women due to their economic activity ranking). Thus, insofar as mixed religion households are concerned, households where the Jewish individual is male are more likely to be included in the Jewish HRP category than households in which the Jewish person is female. In contrast, only 30% of the mixed religion households who responded to the MJRC census included a Jewish adult male – largely because under Jewish law the mother's religion determines whether a child can be regarded as Jewish (Karo 1565) – thus Jewish women with a non-Jewish partner are more likely to interact with the Jewish community through the education of their children at the King David schools.

Notwithstanding the different populations represented by the MJRC and E&W columns in Table 3, there are some material differences in the split of household types which warrant comment. In particular, the proportion of younger single person households in the MJRC census is considerably smaller than in the E&W census. This is to be expected, as younger single persons are unlikely to avail themselves of the educational, social, welfare or synagogal services provided by the community, and are thus invisible to the community; conversely, older couples do make use of these services and form a larger proportion of households in the MJRC census than in the E&W census. Note that to a smaller extent, different definitions used by the MJRC census, where older couples are defined as having an average age of 65 or more (for consistency with MJRC's 2011 census), and ONS requiring all household members to be aged 66 or more to be placed in the older category, contribute to the different proportions found in the table.

Geographic Distribution of Place of Residence

Information on the geographic distribution of the Jewish population within Liverpool is shown in Fig. 1. The data shown in the diagram are extracted from the E&W 2021 census, and are based on middle layer super output area (MSOA) census geography, of which Liverpool is divided into 61, each with an average total population of around 8000 persons. The principal area of Jewish residence is in south-east Liverpool, with a small presence on the city center waterfront. Jewish individuals make up fewer than 4% of the total population, even in the heart of the community area; and across most of the city (where the individual MSOAs are not shown in Fig. 1), they form fewer than 1 in 400 residents. In these latter areas, the median age of MJRC census respondents is around 40 years. The median age increases towards

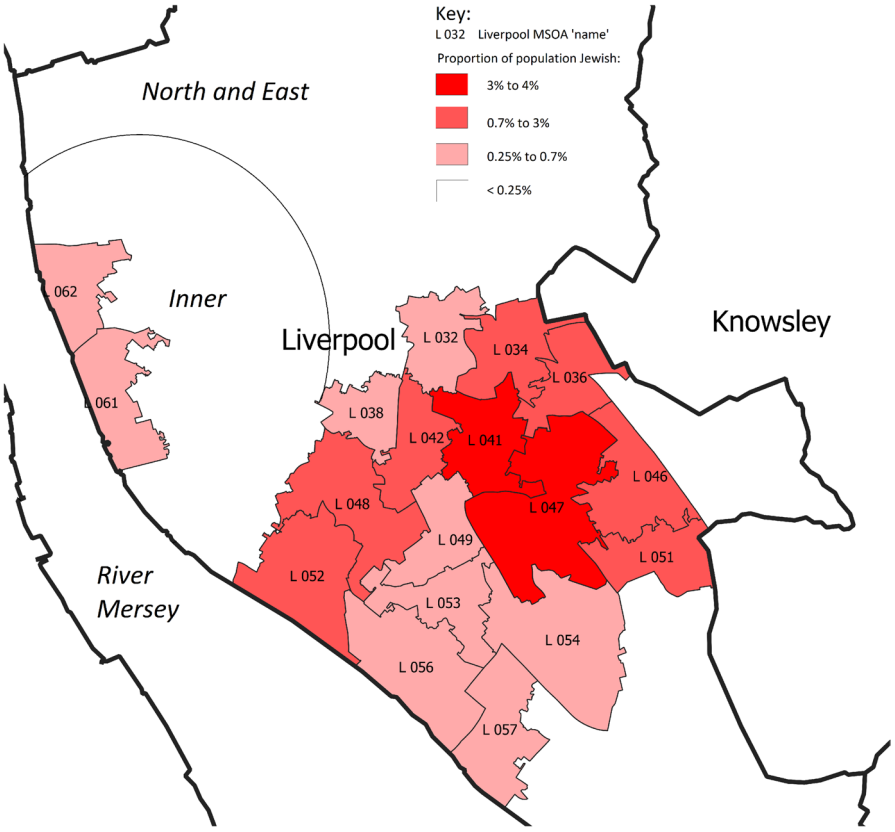

Fig. 1 Population density of Liverpool Jewry by MSOA 2021

the center of the community, and is over 60 in the two MSOAs at the heart of the community.

The place of residence information is presented to provide a more complete picture of the Liverpool Jewish Community, but does not form part of the future projections process. In addition, the MJRC census asked many more questions, relating to economic activity and employment status, health and disability, access to transport and technology, and communications within the community. These aspects are not reported on in this paper, for reasons of space.

Fertility

In most studies, the expected future number of births would be estimated through the use of age-specific fertility rates (ASFRs), calculated by comparing the number of births in recent years with the number of women in the population – typically in 5-year age bands from age 15–19 through to 45–49 (Hinde 2014; Holdsworth et al.

Table 4 Range and mean mother's age at children's birth

Birth year of child	Number of children	Mothers' age range covering 80% of births (census respondents)	Mean age of mother		
			MJRC census respondents	All England and Wales	Married E&W
Children born to MJRC Census respondents only					
1950s–1960s	112	22–31	**26.0**	27.5	27.7
1970s	139	23–32	**27.0**	26.6	26.6
1980s	90	24–35	**29.3**	27.3	27.7
1990s	64	26–40	**32.4**	28.1	29.7
2000s	64	27–40	**32.9**	29.0	31.2
2010+	70	28–40	**34.5**	30.2	–
Total	539	23–37	**29.5**	28.1	–

Source for E&W columns:

ONS: Information on births by parents' characteristics, January 2022 release, Table 4

ONS: Birth Summary tables, England and Wales, 2010, Table 3

2013). The number of births in the Liverpool Jewish Community is too few for a conventional approach to be adopted, even too low for the approach developed by Williamson and Norman (2011); thus, an alternative approach is needed. In addition to investigating fertility levels for recent years, a historical analysis has also been carried out to ensure that rates developed from the limited extent of recent data are compatible with trends over time. The MJRC census asked a number of questions about children within the household, and also about the children of the householders who now live in their own homes, allowing analysis of 539 children born between 1951 and 2021 to be carried out.

Prior to 1970, the youngest mother was aged 18 years, and a quarter of all children were born when their mothers were 23 or younger; no child was born after the mother reached 38. In contrast, in the most recent 10 years, the age of the youngest mother was 23, and more than a quarter of children were born after their mothers had reached the age of 38.

Table 4 summarises this change in pattern. For each 10-year period, it tabulates the mean age of mothers and also the age range at the birth of their children (excluding the highest and lowest 10% of birth ages). A comparison with data for England and Wales as a whole, both for all births and births within marriage (as most Jewish births are within marriage[4]) is also shown. The rate of increase for the Liverpool Jewish Community appears to have been faster than for the wider England and Wales population.

To emphasize the change for the community graphically, Fig. 2 contrasts the pattern of mother's birth ages for the 1980s with those for the next generation. The peak age for giving birth has advanced by around 10 years, from the late 20s to the late 30s in only 30 years, reflecting the changing role and position of women in

[4] According to the E&W 2021 census, only 12 of the 126 Jewish HRP households in Liverpool, in which dependent children were recorded, were co-habiting couple households.

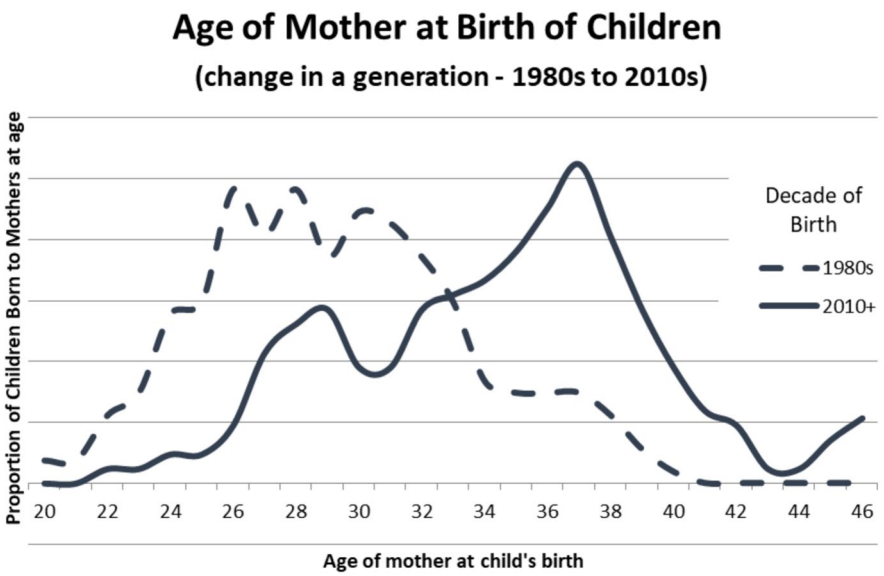

Fig. 2 Generational change in mother's age at birth

modern society – The Second Demographic Transition (Lesthaeghe 2010, 2020). Women's opportunities and their salaries are now more important in maintaining a modern standard of living, and the formation of partnerships and marriages, together with child-bearing, are delayed. This trend can be found in most parts of the world see, for example, Booth (2001), Mathews and Hamilton (2016), and Zakharov and Ivanova (1996).

However, it is important to understand whether this delay in child-bearing has had any influence on the numbers of children born per community family. The information we have about mothers and children presented in Table 4 can, instead, be summarized by family, by the birth decade of the mother. Analyzing the data that way shows that the number of children per MJRC census responding family with children has consistently been around 2.2 for mothers born in each decade from the 1930s to the 1970s. This contrasts with the position for England and Wales as a whole, where the number of children per family with children has fallen from 2.66 in the 1930s to 2.33 in the 1970s.[5] Thus, although family size has been reducing across the country as a whole, the MJRC census sample indicated that families in the Liverpool Jewish community have been smaller for many decades and do not (yet) seem to have been affected by delayed child-bearing in recent times.

As reported in Table 4, in the 2010s most mothers were aged 28–40 years at the birth of their children. During that period the mean number of children born to census respondents was 6.3 per annum. In each year in the same decade the mean number of women census respondents aged 28–40 was 39.6. Thus, on average, the

[5] Source – ONS: Childbearing statistics for women born in different years, published January 2022, Tables 1 and 2.

number of children born per annum was 16% (±3% 95% confidence interval) of the number of women aged 28–40 in the community. This figure can act as a fertility measure substitute for the ASFRs that a study based on a much larger population might produce.

Mortality

Mortality rates cannot be derived from census data. Fortunately, details of Liverpool Jewish burials are collated by MJRC; this information allows death rates to be calculated.

The deaths data for the community for the 2012–2021 period is summarized in Table 5. Combining this information with the age profile summarized in Table 2 has allowed for the mortality rates presented in the table to be derived. The table also includes equivalent figures for England and Wales as a whole. Note that although age-specific mortality rates are usually quoted per 1000 persons (Holdsworth et al. 2013), here they are expressed as percentages, given the small size of the community.

The mean and median ages at death for the Liverpool Jewish Community are higher than for the country as a whole, and this is reflected in the community's slightly lower age-specific death rates.

Migration

In the previous sections we have developed fertility and mortality rates by examining recent data on births and deaths. This is an accepted way forward, as trends in child-bearing practice and longevity evolve quite slowly. Migration patterns are more difficult to assess, as they are influenced by a wide range of personal, family, social, economic and political environments, which can change quite quickly (Fielding 2012; Disney et al. 2015). In any event, current and recent migration patterns, particularly for a small sub-population (such as Liverpool Jewry) can be difficult to measure. In most cases, including this study, direct information and opinions can only be requested from people currently living in Liverpool – gathering information from people who have already moved away is difficult, doubly so regarding persons who might move into an area in the future. The MJRC census included a number of questions to attempt to shed some light on migratory patters. Qualitatively (and informed by MJRC's earlier censuses) the principal timing of, and reasons for, relocation are: school-leavers moving to another locality for university/college study, usually not returning; young adults moving to Liverpool (sometimes temporarily) for employment, often in academia or the health sector; working-age adults and families moving away from the area for job opportunities, or to live closer to their (elderly) parents; retirees relocating to live near their children and/or grandchildren based elsewhere. The follow subsections seek to illuminate/quantify these patterns.

Table 5 Deaths and death rates

Liverpool Jewish burials (inc cremations) of local residents 2012–2021

Age at death	Up to 59	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99	100+	Total	Mean	Median
Men	5	0	10	10	21	30	34	37	20	2	170	84	86
Women	10	7	12	12	17	18	31	52	32	6	197	84	88
Total	15	7	22	22	38	48	65	89	52	8	367	84	87

Death rates 2012–2021

Age band	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95+		
Liverpool Jewish 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	84	88
Combined	1	1	1	2	3	8	18	27	84	87
England and Wales										
Men	1	1	2	4	7	13		24	76	79
Women	1	1	2	3	5	10		21	81	84
Combined	1	1	2	3	6	11		22		

Source of E&W data – ONS: Deaths registered in England and Wales 2020 – various tables:

Death rates are average over 2011–2020 period (from Table 3)

Mean ages are for 2020 (from Table 12)

Median ages are for 2020 (from Tables 4 and 5)

Out-Migration of School Leavers and Adult Children

In addition to asking about children living in the household, the MJRC census also sought information about children of the adults of the household who now live elsewhere. The information on the location of children is summarized in Table 6. All those aged 0–17 years live in the parental home; most of the 18–24 year olds were either still at home or away at college. Older "children" are found mainly in their own homes – the majority having moved away from the local area. Indeed, the proportion not living locally is presented in the table. A more detailed breakdown of home location for those aged over 25 years is shown in Fig. 3, which emphasises the draw of the London and Hertfordshire area (and to a lesser extent the Manchester area) with its vibrant Jewish communities.

The proportion of the sample who have moved away peaks at 80% for the 35–44 age band, reducing to two-thirds for the oldest group. The lower rate for the 25–34 age group may be a reflection of a more difficult economic environment, leading to remaining in the parental home for longer and delaying partnership formation. A comparison with MJRC's 2011 census suggests that the proportion of the community who chose to locate away from the local area by their early 20s (at the end of tertiary education or as a career step or lifestyle choice) may have been higher in previous years; however, the analysis of the 2021 MJRC census indicates that currently, of the order of 56% of that age group out-migrate.

Note that about 10 of the sample of over 600 'children' under consideration here may have left their family home before their parents moved to the Liverpool area, and thus never lived locally and cannot be regarded as having moved away. The number is not sufficiently large to distort the overall picture described here.

From Where and Why Have Adults Moved into the Community in the Past?

To help predict how or why individuals and households might relocate to Liverpool in the future, the MJRC census questionnaire enquired about the birth places of adults, and why those not born locally had moved to Liverpool.

The place of birth data are summarized in Table 7 by age group. The table presents that of the over 50s in the sample, two-thirds were born locally, increasing to three-quarters for the sample in their 80s. For the under 50s, the distribution of birth places is somewhat different to the older groups, with a local proportion less than two in five. For the youngest group, a quarter were born beyond Europe (the majority in Israel), compared with the older groups where this proportion is minimal. Note that the table is based on place of birth – the move to Liverpool may be from an intermediate location (perhaps London) rather than directly from country of birth.

In the recent past the community has been able to attract people to move to Liverpool; indeed, it seems reliant on in-migration of adults aged under 50 years (and their children) if its contraction is to be mitigated.

Table 6 Place of residence of children of MJRC census respondents

Age of child	Living in parental home	Away at college	In their own home in			All children	Proportion NOT living locally	
			local area	Rest of England	Elsewhere		MJRC census respondents	Projection for Liverpool Jewish Community
0–17	115					115	0%	
18–24	11	12	4	6	1	34	56%	58% ± 9%
25–34	11	1	23	33	15	83	59%	
35–44	1		26	88	17	132	80%	73% ± 4%
45–54	2		39	73	28	142	71%	
55+	1		29	41	14	85	65%	
All ages (including	**151**	**13**	**124**	**248**	**78**	**614**	**55%**	**55% ± 4%**
unknown)	25%	2%	20%	40%	13%	100%		
All aged 25+	**3%**	**0%**	**26%**	**53%**	**17%**	**100%**	**70%**	**70% ± 4%**

The MJRC census questions also sought to establish when and why people have moved to Liverpool. That information (for 157 of the 186 remotely born responding adults who have moved to Liverpool) is set out in Table 8.

Two categories cover more than two-thirds of moves – meeting/marrying someone from the area, or due to a job opportunity. The meeting/marrying category is, however, on the wane – due to school leavers moving away, there is now a much smaller pool of potential partners than there was in the 1960s and 1970s. Conversely, moves for employment are on the rise; however, if the move to Liverpool has, in the past, been a stepping stone on the career path, then those moving on again will be missing from earlier decades' figures. However, it is worth noting that overseas-born individuals make up a major portion of those relocating to Liverpool for employment reasons.

It is clear that the reasons for migrating to the Liverpool area have varied over time. As job opportunities are now the largest single 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, nationally and internationally; it is worth noting that Grizzard (2019) reaches a similar conclusion about in-migration to Leeds. A closer examination of the MJRC census responses shows that recent arrivals (that is, in the last 10 years) constitute about half of 30–39-year-old and a quarter of 40–49-year-old respondents. Expanding these proportions to the total Liverpool Jewish community would imply about nine new adult arrivals in the area per annum. However, the equivalent analysis of the 2011 MJRC census produced a figure of only four per annum. Caution is thus needed in looking to the future as this element of migration is clearly volatile, and the current level could represent a high point.

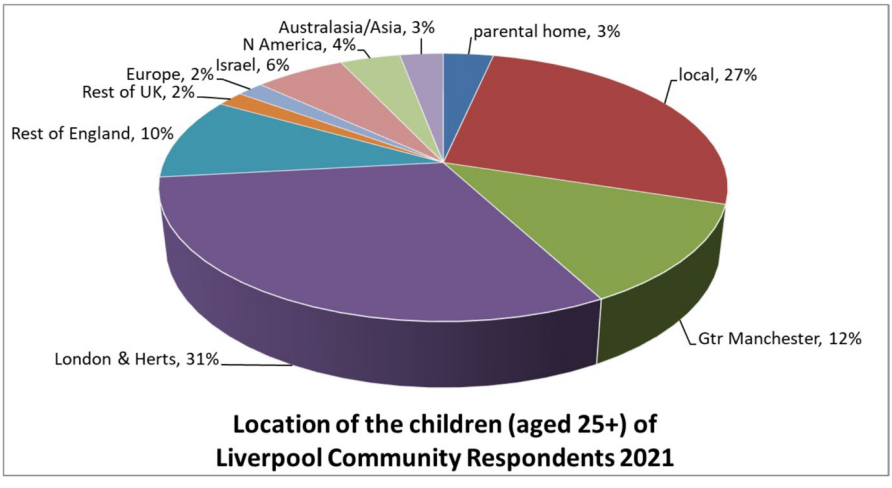

Fig. 3 Location of children of MJRC Census respondents

Table 7 Place of birth

Age group	Birth decade	Birthplace of main adults in responding households (Proportion of age group)							Number of respondents
		Local	Manchester area	London area	Rest of UK/Ireland	Continental Europe	Israel	Rest of world	
22–49	1970s/1980s/1990s	38%	9%	10%	15%	4%	16%	9%	81
50–69	1950s/1960s	67%	8%	10%	10%	2%	1%	2%	172
70–79	1940s	72%	9%	2%	14%	1%	1%	1%	167
80 plus	1920s/1930s	75%	2%	6%	13%	3%	0%	2%	106
All ages (including unknown)		65%	7%	7%	13%	2%	3%	3%	
Number of respondents		353	39	36	68	10	18	15	539

Estimating the Level of Out-Migration of Adults and Retirees

The most problematic element of migration is the assessment of out-migration from an area. There is no practical way in which an objective sample of individuals and families who have already left an area can be put together, and although we have information on the locations of children of Liverpool-based adults who do not live in the local area, we have no information on when or why they out-migrated. The MJRC census did, however, include some questions to enable some quantitative and some opinion-based analysis to be carried out.

The likelihood of an individual or family moving away from the area in the future may be influenced by the extent that adults have parents living the area, or older persons having non-dependent children resident locally. (Dependent children are assumed to be tied to their parents, so are assumed not to act as a significant restraint on movement – though those of an age close to public examinations may temporarily limit options for moving away).

Table 9 subdivides the households who responded to the MJRC census into those where the adults in the household have either parents or non-dependent children living in only in the local area, only outside of the local area, or both locally and remotely, or have no living parents or non-dependent children. The final two columns of the table summarize the proportion of responding households who do not have locally living connections, and the proportion with only locally living close family. In the context of family ties, the former can be considered to have minimal limitation on moving away from the area, and the latter, the maximum level of restraint on out-migration. Households where the average age of the adults is below 65 years have a higher level of connection with the local area, particularly the 45–54-year age group, where half have close family connections only in the local area, and only a quarter have no local family tie. Conversely, more than half of those aged 65 years or older have no local close family, and only 1 in 6 to 1 in 8 have only local ties. Subject to the extent that family ties are an important influence on decisions to relocate, we would anticipate that the likelihood of moving away from the area will be higher for those in the older age groups.

From a welfare perspective it should be noted that more than two-thirds of respondents aged 85 years or older, living in households, do not have locally based children. This may necessitate increased provision for residential care for the very elderly in the future, because fewer will have close family available to assist them to continue to live independently.

This quantitative assessment is intended to act as a backdrop to the analysis of MJRC census questions which asked whether the respondents anticipated moving away from the Merseyside area in the next 10 years, and if so, what might drive that decision. Of course, it is important to recognize the potential difference between opinions given at the start of a period of time, and the actual reality which emerges in the next 10 years. Nevertheless, it is worth examining the responses to these questions.

Only those respondents who were able to provide a definite ‘yes/no’ response were included in the assessment. The proportion firmly expecting to move away in the next 10 years fell fairly evenly from 17% for those aged 20–44, to only 4% for

Table 8 Move to Liverpool—When and why?

Decade of arrival	Adult MJRC census respondents not born in Merseyside/Chester							
	Met someone/ marriage	Employment	Family here	To study then stayed	Life-style change	Jewish environ-ment	Other reasons	All reasons
1930s–1960s	15	4	4	3		1	2	29
1970s	13	10	3	4		1		31
1980s	6	8				2	1	17
1990s	13	6		2				21
2000s	3	4	5	2	1	1	1	17
2010s	7	18	3	2	6		6	42
Total	57	50	15	13	7	5	10	157
By reason	36%	32%	10%	8%	4%	3%	6%	100%

Table 9 Location of parents and non-dependent children

MJRC Census-responding households							
Age of household adults	Location of parents and non-dependent children of main adults in respondent households				All households	Proportion without locally living parents or non-dependent children	Proportion with only locally living parents or non-dependent children
	Only living locally	Only living remotely	Locally and remotely	No living parents or non-dependent children			
20–44	8	14	13		35	**40%**	**23%**
45–54	18	7	9	2	36	**25%**	**50%**
55–64	16	10	14	6	46	**35%**	**35%**
65–74	17	32	30	20	99	**53%**	**17%**
75–84	10	36	23	9	78	**58%**	**13%**
85+	5	16	7	11	39	**69%**	**13%**
All ages	**76**	**117**	**97**	**48**	**338**	**49%**	**22%**
(including unknown)	**22%**	**35%**	**29%**	**14%**	**100%**		

the 85+ age group. Expanding the sample response to represent the whole community indicates a probability of moving away of 15% ± 6% for the under 65 year olds, and only 7% ± 3% for those aged 65 or older. This may appear contrary to conclusions on the basis of family ties. However, breaking the data down in terms of family ties shows that the number of 'yes' and 'no' responses for households with only local ties was 1 'yes' and 53 'no' (2% expecting to move away); and for those with only remote or no ties was 16 and 82 (16%), respectively.

There are different pressures at various points in the life-cycle, so reasons for moving away may depend on the age of the adults in the household. However, from a community planning perspective, it is worth noting that, effectively independent of age, the driver of a quarter of those planning to move was either a dissatisfaction with elements of Liverpool community life or a desire to live in a larger Jewish community. The main reason to move expressed by 20–44 year olds was job related; for 45–64 year olds there was an even split between moving closer to children and moving closer to parents or other family. Unsurprisingly, for the 65+ age group the main driver was moving to live near children. As regards the destination of all moves, about 50% would be bound for the London area.

Developing and Assessing Population Projections for the Future

In the previous sections a community population estimate for 2021, by gender and age, has been developed (as set out in Table 2). This can act as a base point for the development of future predictions. The issue of fertility and the number of births per annum has been discussed, leading to an estimated number of births per annum of 16% ± 3% of the number of women aged 28–40 years in the community. Across England and Wales, slightly more boys than girls are born.[6] However, given the small number of annual births in the Liverpool Jewish community, allowing for an uneven gender split is unnecessary.

Mortality rates and thus the number of deaths expected in each age band per annum have been set out in Table 8. Fertility and mortality rates do not remain constant; however, the number of children per family within the community has barely changed over a number of decades. In view of the age profile of the community (somewhat biased towards the older age bands), any evolution of fertility rates over say, the next 20 years will have only a minimal impact on projected population numbers. Life expectancy in the UK has been slowly increasing over recent decades, however, age at death of community members is greater than for the wider population, so any increases for the Jewish community can be expected to be small; again on looking 20 years forward slightly reduced death rates would have minimal impact. Thus no changes to the established fertility and mortality parameters are proposed.

The discussion on migration has established that the principal elements comprise:

[6] Source – ONS: Birth summary tables, England and Wales, 2020, Table 1.

a. young adults (mainly before the age of 25) moving away from the area for educational, employment, or other reasons and not returning;
b. working age adults (generally 25–49 year olds) moving into the area primarily for employment reasons;
c. households moving 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;
d. adults who will move away at or beyond the end of their working lives to live near their children.

A combination of quantitative and stated-expectation analysis has allowed these elements to be estimated as follows:

a. $58\% \pm 9\%$ of young adults out-migrating, by age 34, but primarily following tertiary education;
b. 4–9 working age adults arriving into the area per annum (6.5 ± 2.5);
c. $15\% \pm 6\%$ of working age adults moving away from Merseyside in the next 10 year period, that is, $1.4\% \pm 0.5\%$ per annum;
d. $7\% \pm 3\%$ of retirees relocating to be near their children over the next 10 years, $0.7\% \pm 0.3\%$ each year.

How migratory pressures may vary in the future is very difficult to predict. However, as the community continues to shrink it seems likely that the proportion of young people choosing not to stay on reaching adulthood will rise. A consequence of this would be an increasing rate of retirees leaving the area as fewer of their children remain. To take a cautious approach to future population levels, small arbitrary increases in these two rates have been assumed (to 60%, and 0.9%, respectively). The other two elements are much more dependent on local employment opportunities and economic prospects elsewhere, both of which might be quite volatile. As it is not realistic to forecast how these factors may change, no changes to the assessed working age migratory rates have been made.

A central forecast has been produced on the basis of the central point figures set out above, together with low and high forecasts, on the basis of the higher and lower values – that is, the low forecast based on a low birth rate, high out-migration and low in-migration, and the reverse for the high forecast. Use of the 95% confidence intervals set out above would produce extreme forecasts, as the likelihood of each element demonstrating wholly pessimistic values or wholly optimistic values for a continued period is small. Forecasts based on the 95% confidence intervals have therefore been termed ‘limiting low’ and ‘limiting high’. Additionally, forecasts based on a confidence interval of half that width (that is, a normal distribution z-value of 0.98 rather than 1.96, giving a 67% confidence interval for each parameter) have also been prepared, referred to here as ‘nominal low’ and ‘nominal high’, respectively. These nominal models might encompass the actual population figures which emerge in reality.

Table 10 Forecast population totals

Forecast	Liverpool community			
Model	Projected population total			
	Year			
	2026	2031	2036	2041
Limiting high	1690	1550	1380	1220
Nominal high	1660	1490	1300	1110
Central	1630	1430	1220	1010
Nominal low	1590	1370	1140	920
Limiting low	1560	1310	1070	840

Table 11 Central forecast age profile

Age range	Liverpool community			
(Years)	Projected age profile			
	Central forecast year			
	2026	2031	2036	2041
0–9	140	120	90	70
10–19	160	140	120	100
20–29	70	80	90	60
30–39	90	70	60	60
40–49	160	120	110	90
50–59	140	150	150	120
60–69	200	150	120	130
70–79	350	240	160	120
80–89	260	280	240	170
90 & +	70	70	90	90
Total	**1630**	**1430**	**1220**	**1010**

The projected Liverpool Jewish community population estimates for 5, 10, 15 and 20 years post 2021 are presented in Table 10, and the age distribution for the central forecast is presented in Table 11. The purpose in presenting the data in Table 10 is to understand the sensitivity of the forecasts to changes in the underlying assumptions. For simplicity, the same assumptions (as regards whether the birth and migration rates remain as seems probable at the present time) are assumed to apply for the whole 20-year period; in reality, the situation will evolve as time passes.

On the basis of these range of population totals and age profiles associated with them, the needs of the community, and the ability to sustain those services, have been predicted. Particular items which have been assessed include:

- Demand for places at the King David Primary and High schools in Liverpool
- The scale of youth activities which might be needed

- Expected numbers of synagogue members
- The extent of social and welfare provision needed
- The balance between the numbers of community members who might fund welfare provision and the numbers who would wish to avail themselves of those services
- Likely level of demand for elderly residential care places
- The number of burial plots needed in the Jewish cemeteries.

Discussion and Conclusions

This paper has demonstrated that it is possible to provide a shrinking community with a quantified population projection to allow the community's organisations to plan for the future on a realistic basis, and to be forewarned of difficulties that may arise. In this specific case, the projections do, of course, predict a continuing shrinkage of the community; given recent trends this is to be expected. However, without the community census it would not have been possible to provide a more nuanced appreciation of how that contraction would impact on the age profile. For example, the number of very elderly persons without local supporting family is predicted to increase, but with a significant reduction in the age groups who might lead the community in the future.

Such an approach would be valid in any sub-population or community, whether shrinking or expanding, and whether based on religion, ethnic background or other criterion. The essential elements that made this approach viable are some form of over-arching umbrella organization for the community; communications processes which allow the majority of the community to be informed of, and encouraged to take part, in the process; and some independent estimates or knowledge of the size of some key parts of the community, to ensure that any bias in the responding sample to a survey can be understood, and if possible, adjusted for.

Appendix: Merseyside Jewish Community Census 2021 Form

Appendix A: Merseyside Jewish Community Census 2021 Form

Merseyside Jewish Community ***Census 2021***

Organised by the Merseyside Jewish Representative Council

Merseyside Jewish Community Census – August/September 2021

Please try and answer all questions that apply to your situation, thank you.

1 How many people normally live in your household most or all of the time.
(include yourself; also include children studying away from home who normally live with you)……..

2 How many of these are Jewish ……. 3 Your home postcode, please ……

4 **About the main adult(s) in your household** (you and your spouse/partner if you have one):

	Gender	Age (on 31 Aug 2021)	Town of birth	Member of a local shul?	If you were NOT brought up in the Merseyside/Chester area,	
					Which YEAR did you move here?	And WHY? (for example, came with parents, to go to college, job opportunity, met someone from here, move near children)
1st main adult	M / F			Y / N		
2nd main adult	M / F			Y / N		

5 **Your Children at School**

	Gender	Age (on 31 Aug 2021)	School Year (2021/22)	At King David Liverpool?
i	M / F			Y / N
ii	M / F			Y / N
iii	M / F			Y / N
iv	M / F			Y / N
v	M / F			Y / N

6 **Your Children at University or College**

	Gender	Age (on 31 Aug 2021)	College/University Town (2021/22)
i	M / F		
ii	M / F		
iii	M / F		

7 **Your Other Children living with you** (pre-school or post-education)

	Gender	Age (on 31 Aug 2021)
i	M / F	
ii	M / F	
iii	M / F	
iv	M / F	

8 **Any other people living in your home** (eg parents, extended family)

	Gender	Age (on 31 Aug 2021)
i	M / F	
ii	M / F	
iii	M / F	
iv	M / F	

9 **Your children now living in their own households**

	Gender	Age (on 31 Aug 2021)	Living in which Town (or country if overseas)
i	M / F		
ii	M / F		
iii	M / F		
iv	M / F		

Some questions which look to the future -

10 a Do the main adult(s) have **parent**(s) living **locally**? - Yes☐ No☐

b Do the main adult(s) have **parent**(s) living **elsewhere**? - Yes☐ No☐

If 'Yes' to elsewhere, is it likely that they might move here to be near you? - Yes☐ No☐ Don't Know☐

11 Do you expect to **move away from** the Merseyside area in the next 10 years? Yes☐ No☐ Don't know☐

If Yes, where might you be living …… and why might you have moved -

move near parents☐ move near children☐ employment-related☐ make aliyah☐

move to larger Jewish Community☐ study-related☐ other (please state) ……

Finally, some questions about our life today (remember that the census is anonymous, you cannot be identified); please tick one or more:

12 Employment: 1st main adult: Work full time☐ Work part time☐ Home-maker☐ Retired☐ Student☐ Other☐

2nd main adult: Work full time☐ Work part time☐ Home-maker☐ Retired☐ Student☐ Other☐

13 Health: 1st adult: Good☐ Fair☐ Poor☐ Registered disabled/blue badge☐ Have professional carer(s)☐

2nd adult: Good☐ Fair☐ Poor☐ Registered disabled/blue badge☐ Have professional carer(s)☐

14 Modern life: Household has: a car☐ a bike☐ Broadband at home☐ Smart mobile phone☐ computer/tablet☐

15 Communication: Which of the following do you regularly read:

Jewish Telegraph ☐ Jewish Chronicle ☐ Shul Newsletter ☐ MJRC Community email newsletter ☐

16 Do you receive the MJRC Year Book: Yes☐ No☐ Do you read it: Mostly☐ Partly☐ No☐

Do you find the following sections useful/interesting	Very	Moderately	No	Don't know
Community Organisation/Information Pages	☐	☐	☐	☐
Historical Articles	☐	☐	☐	☐
Editorial and Reports	☐	☐	☐	☐

17 Your comments on the census (we cannot reply to these) ……

……

Thank you for taking the time to complete our census. It is much appreciated.

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Declarations

Conflict of interest The author has no relevant financial or non-financial interests to disclose.

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Philip Sapiro graduated in civil engineering (B.Eng.) and transport planning and engineering (M.Sc.) in the 1970s. Following a successful career in transport planning, he undertook a Ph.D. at the University of Liverpool in population geography and demography. Since 2017 he has been an honorary research associate in the geography and planning department at Liverpool. His interests are historical and modern Anglo-Jewish demography (and a specific interest in Liverpool), genealogy and local history. Recent papers include: "Religious intermarriage in England and Wales: Differences in individual and area Characteristics of endogamous and exogamous Couples," *European Journal of Population*; "Understanding the spatial trajectories of minority groups: An approach that examines their demographic, Cultural and socioeconomic characteristics," *Comparative Population Studies*; "250 years of Jewish burial in Liverpool," *Jewish Historical Studies*; and "Understanding the current geographic disposition of the Jewish population of England and Wales: Growth and contraction," *Contemporary Jewry*.