

Presidential Address

A Hundred and Fifty Years of Vital Statistics: Documenting Demographic Change in Ireland

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(Read before the Society, 19 May 2016)

Keywords: demographic change, demographic history, vital statistics, Ireland

JELs: N33, N34

1. INTRODUCTION

In December 2015 the CSO published the 150th annual *Vital Statistics* volume (for 2013) – a publication which has played a central role in documenting demographic change in Ireland since the first edition for 1864. This paper uses these data, together with other data, especially the data from the Census, to examine how Irish demography has evolved over the last century and a half.

The fiftieth anniversary of the *Vital Statistics* (then called the *Annual Report of the Registrar General for Births, Deaths and Marriages in Ireland*) was celebrated by the then Registrar General,² Sir William Thompson, in his Presidential address to the Society in 1919 in which he analysed the trends over the previous 50 years. As a result, I felt that it would be appropriate to mark the subsequent century of the publication of the *Vital Statistics* volume in my Presidential address.

The Statistical and Social Inquiry Society of Ireland was founded 168 years ago at the time of the Great Famine. While the demographic effects of the tragedy that was playing out at its foundation did not really feature in the deliberations of the Society at the time, there was extensive discussion of the underlying economic causes (Daly, 1997). One of the founding members of the Society, Dr. William Wilde (father of Oscar) had been involved in the compilation of detailed data on deaths and disease from the 1841 and 1851 Censuses but he did not discuss the results of his analysis in the Society.

The Society itself played a role in initiating the collection of data on vital statistics (Daly, 1997). The National Association for the Promotion of Social Science in 1862 asked the Society to co-operate in preparing a bill to establish the registration of births, deaths and marriages. The bill, as subsequently enacted, initiated the formal registration system from 1864.

In 1883 the then Registrar General, Sir Thomas Grimshaw, gave a paper to the society on the results from the 1881 census (Grimshaw, 1883). This began a tradition of papers by staff involved in the collection and analysis of the Census data, which has continued for the last 135 years. For example, Thompson in 1913, and again in 1926, gave papers on the Census carried out in the immediate previous years.³

The focus of the papers to the Society on Irish demography has shifted over time, reflecting the wider policy concerns of Irish Society. In the early years of the 20th century a lot of attention was given to the incidence of infectious diseases. McWeeney (1907) gave a paper on Tuberculosis showing that while the death rate was falling in Great Britain, it was rising in Ireland. In his 1919 paper Thompson paid considerable attention to the number of deaths from infectious diseases, with a follow-up paper on deaths from influenza in 1920.

¹ The author would like to thank the Director and staff of the CSO, Aidan Punch, Norman Caven and Damian Courtney for their very helpful comments and suggestions on an earlier version of the paper. This paper provides background and detailed analysis used in FitzGerald, forthcoming.

² The Registrar General performed many of the roles carried out today by the Director of the CSO.

³ In a paper to the society in 1911, Thompson “advertised” the importance of the imminent Census and his 1913 paper on the preliminary results of the 1911 Census was accompanied by slides – possibly the first example of what has now become a commonplace method of communicating results in papers at the Society.

Not surprisingly, as infectious diseases were a major cause of premature deaths, considerable space in the annual Vital Statistics publication was given to the cause of death and to comparisons with the results for other parts of the then United Kingdom.

In the late 1930s and early 1940s many papers focused on public health issues. The comparative data on Vital Statistics for the UK and for Ireland showed that the improvement of life expectancy in Ireland was lagging well behind that in England and Scotland, an obvious matter of concern.

However, over the last fifty years medical advances and declining poverty has seen the deaths from infectious diseases dramatically decline and the focus of attention of Irish demographers, as reflected in the Proceedings of this Society, has changed.

In the middle years of the twentieth century quite a number of papers and symposia focused on what was referred to as “the Irish population problem” – the fact that the population was falling, in contrast to the experience in much of the rest of Europe. In 1938 a symposium of the Society, which was broadcast live on Radio Éireann, considered this issue (Brennan, *et al.*, 1938). Again, after the publication of the Commission on Emigration, in 1955 discourse in the Society on demography again focused on the “population problem”.

More recently papers have considered the factors underlying falling fertility, the dramatic improvement in life expectancy (Walsh, 2008) and the new phenomenon for Ireland of immigration. For example, Fahey, FitzGerald and Maitre, 1997, looked at the educational attainment of emigrants and returned emigrants and Finneran and Punch, 1999, looked at the characteristics of recent immigrants to Ireland.

Before 1864 the only consistent demographic statistics available for Ireland were provided by the Census held every 10 years. While hugely valuable, the Censuses from 1821 onwards could not properly document changes in births and deaths over the intervening years.

It was only from 1864 that there was a legal requirement in Ireland to register births, deaths and marriages, many years after this requirement had been introduced in England in 1837. The registration of these data provided the basis for reliable time series on births, deaths and marriages (and related data). Limited data on emigration were also included. These statistics have been published for every year since 1864. The volume for 1864 was published, with some delay, in 1869. The 150th volume for 2013 was published just two years later in December 2015.

In Section 2, I describe a significant database of statistics on Irish demography since 1800 drawn from the Vital Statistics, the Census and some other sources. These data are available in an excel spreadsheet. These data may be of more variable quality for the earlier years. Nonetheless, when tested, the data from 1864 onwards appear to be internally consistent, allowing the development of a reasonably consistent picture of demographic change over a long period.

In order to allow comparisons over such a long period I analyse separately developments in the 19th century in what later became Northern Ireland and the Republic of Ireland. This allows me to analyse developments over the full 150 years for the Republic of Ireland, Northern Ireland and the island of Ireland.⁴

In Section 3 the changes over time in fertility behaviour are discussed. Section 4 describes the changes that have occurred in life expectancy and Section 5 analyses the data available on net migration over the century and a half. Section 6 combines these data to look at how changes in life expectancy and migration behaviour affected the survival of different cohorts of the population in Ireland. Finally, conclusions are discussed in Section 7. Appendix 1 gives details on completed family size for cohorts of women over the last century. In appendix 2 a methodology to approximate life tables for earlier years in the 19th century is described. This is used to analyse the internal consistency of the available data for the middle of the 19th century, providing a cross check on the data on emigration and deaths available from other sources.

⁴ While the Republic of Ireland should correctly be referred to as Ireland, to avoid ambiguity I use the term “Republic” to distinguish it from the island of Ireland, Ireland as it was prior to 1922.

2. THE DATA

The first full Census for Ireland was undertaken in 1821.⁵ While it was considered rather unsatisfactory, because of uneven coverage, it contained a huge amount of very useful information on the population. Though the quality of the 1831 and 1841 Censuses improved, there remain concerns that there was some undercounting (Lee, 1981).⁶ The 1851 Census and all subsequent Censuses are believed to provide reliable data on the population.

Over the period to 1911 the Census was undertaken every decade. Because of the disruption due to the war of independence the Census was postponed in 1921 to 1926, both in Northern Ireland and the Republic. The subsequent Censuses were undertaken in the Republic in 1936 and 1946 and then nearly every 5 years thereafter.⁷ In Northern Ireland there was a Census in 1937 and one in 1951. The 1941 Census was omitted in both jurisdictions because of the War. Since 1951 a full Census has been held in Northern Ireland every decade.⁸

The disruption to the normal pattern of decennial censuses from 1921 till 1951 makes some analysis difficult, especially when following the experience of different cohorts in Section 6. Nonetheless coverage for the Republic is quite adequate for the analysis undertaken here. For Northern Ireland the disruption was more extensive and the data collected and published was more limited, which makes some analysis more difficult.

The Census data for the 19th century, and into the early decades of the 20th century, showed a significant distortion in the age profile for those aged over 20 – people tended to round their ages so there is significant “heaping” at ages 30, 40 etc. This makes it difficult in following single year age cohorts through successive censuses. Even using five year cohorts for analysis, this distortion causes problems and, as a result, in some of the analysis ten year cohorts are preferred.

While the Census provides detailed data on the population at a point in time, there was a major gap in demographic data in the first half of the 19th century due to the absence of a system for registering births, deaths and marriages. This lacuna was recognised early in the 19th Century. Some attempt to deal with this was made in the 1841, 1851 and 1861 Censuses by asking households for details of births and deaths in their households over the previous decade. However, such data proved very unsatisfactory. For example, while the data on births in the previous year, recorded in the 1861 census, was consistent with the number of births registered three years later in 1864, the recall data show increasing problems for earlier years. This problem was recognised at the time in the Census commentary.

This serious gap in the demographic data was finally addressed when compulsory registration of births deaths and marriages was introduced from 1864 onwards. The first Registrar General’s Report for 1864, giving details of the data collected as part of the registration process, was published in 1869. Since then the report (now called *Vital Statistics*) has been published for every year, with the 150th report for 2013 appearing last December. With the establishment of Northern Ireland a similar Report has been published there every year.

Up to the 1920s the reports also gave details of emigration each year. These data covered people who gave their addresses as previously resident in Ireland when they sailed to non-European destinations from ports in Ireland or Great Britain. No information is available, however, for the numbers who returned. Even more important, these data provide only limited information on numbers emigrating from Ireland to Great Britain. However, the analysis undertaken in the Commission on Emigration, 1955, indicates that only around 10% of emigrants went to Great Britain. As a result, these data can be used to track movements in emigration between censuses. Also, information is given on the age of those emigrating every year from 1864 onwards.⁹

⁵ While it was attempted to take a Census in Ireland in 1813 this was not successful. For a history of Irish Censuses from 1813 to 1911, and for subsequent Censuses in Northern Ireland, see the very useful paper by White, 2011. Linehan, 1991 also provides a very detailed history of the Census in Ireland.

⁶ While Lee suggests that there was possibly some under-enumeration in 1841, Linehan, 1991, details the elaborate procedures implemented to ensure the reliability of that Census.

⁷ The 1956 Census just involved an enumeration of population numbers. The 1976 Census was dropped but a full enumeration with a limited number of questions was undertaken in 1979, with a reversion to the pattern of five year Censuses in 1981. The 2001 Census was postponed till 2002 because of an outbreak of Foot and Mouth disease.

⁸ A Census with a limited sample was undertaken in Northern Ireland in 1966 (White 2011).

⁹ Data on the names, ages and addresses of all passengers leaving the then UK for non-European destinations are now available online. Checking on the known movement of individual family members from 1900 to the 1930s suggests that these data are quite reliable. Courtney, 2000, summarises more recent data on the age profile of migrants.

The CSO has published annual estimates of net migration from 1926, which are adjusted after each census to reconcile the data from the census with the data on births and deaths. Similar data for Northern Ireland are only available on an annual basis from the 1960s onwards.

Since their inception, these annual reports on Vital Statistics have contained a wealth of data on deaths, the cause of death, the age at which death occurred and where in the country deaths occurred. There is also considerable detail on births, in particular their location. For marriages a lot of attention in the early years focused on the religion of those getting married. While a question was asked on the age of the spouses, the response rate was just under 50% in 1864, falling to around 12% in 1907. A constant refrain in the reports over almost a century is the need to improve enumeration of the age of spouses at marriage.

It is clear from the first report that a major driving force behind the collection of the data arose from concerns about public health. A lot of attention was focused on analysing the data on cause of deaths. Also, from the beginning, the reports provided comparative data for other parts of the then United Kingdom in order to assess the nature of the public health problems faced in Ireland.

The style of the reports changed little from 1864 for over a century. Some of the same tables appear each year and some of the analysis, which first appeared a century before, is still carried out in publications in the 1970s.

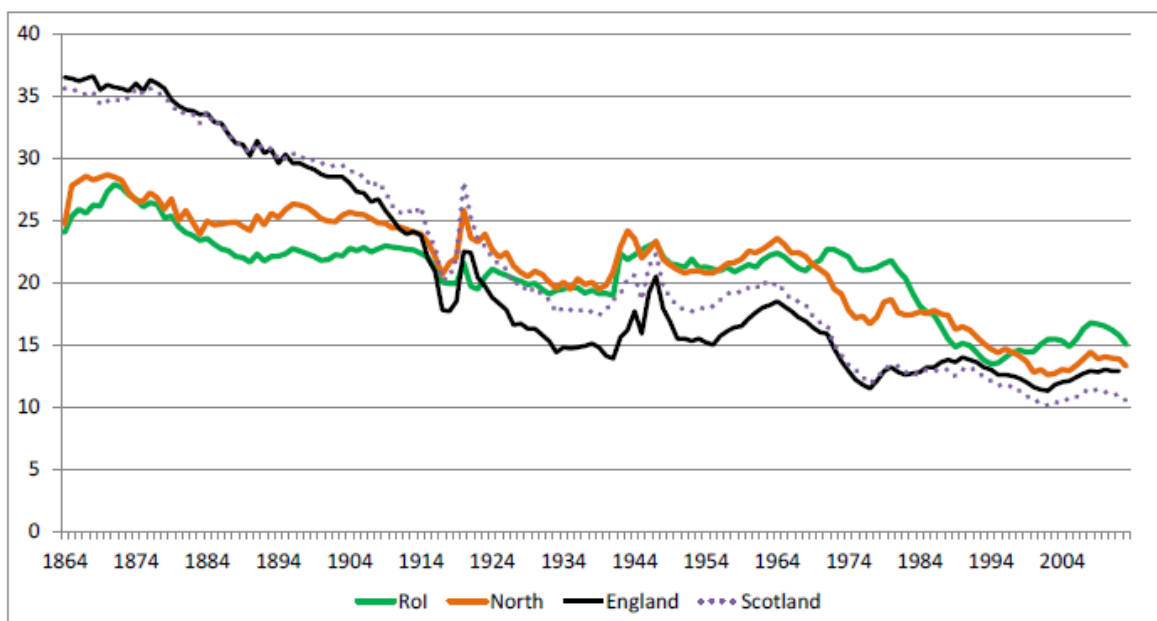
Throughout the 150 years the Reports provided analysis without commentary on the significance of the trends. As discussed later, the one exception in a century and a half of publications was a special concern expressed in 1923 (and succeeding years) about the very high rate of infant mortality among children born to unmarried mothers.

3. FERTILITY

In the early 1860s the birth rate was much higher in Scotland and England than in either part of Ireland (Figure 1). However, in the 50 years before the First World War the birth rate fell very rapidly in both England and Scotland, whereas the decline was much more gradual both in Northern Ireland and in the Republic of Ireland. By 1914 the birth rate in Ireland and England had converged, with the Scottish rate still being slightly higher.

However, the First World War affected the birth rate across all regions of the then United Kingdom as many young men were away from home serving in the British army. In the Republic the birth rate fell by 2.3 per thousand between 1914 and 1917 and in Northern Ireland by 3.2 per thousand. The declines were much bigger in England and Scotland – where the birth rate declined by around 6 per thousand. The difference between the experience in Ireland and Great Britain probably reflected the fact that a much higher proportion of the young male population were in military service in Great Britain.

Figure 1: Birth Rate (per thousand)



Source: Commissioner's Reports

At the end of the War there was a small recovery in the birth rate in the Republic in 1920 but a bigger recovery in Northern Ireland and Great Britain as the troops returned home in 1919. The rather small bounce in the Republic of Ireland at the end of the War contrasts with the clear impact of the outbreak of War reducing the birth rate. This difference may owe something to the impact of the War of Independence in 1919-21 on the experience of those troops, from what is now the Republic, returning to civilian life.

In the inter-war years the birth rate in Ireland and Scotland followed a rather similar slow downward path. However, unlike in the case of the First World War, there was actually a rise in the birth rate in both Great Britain and Ireland in 1942 and 1943 during the Second World War. At the end of the War in 1946 and 1947 there was a temporary surge in births in Great Britain, something that was not seen in either part of Ireland. Once again this may be due to the differential effect of a higher proportion of the young male population returning from military service in Great Britain than in Ireland.

Table 1: Birth Rate (per thousand) and Proportion of Non-Marital Births

	Birth Rate per 1000 population				Proportion of births non-marit	
	Republic of Ireland	Northern Ireland	England	Scotland	Republic of Ireland	Northern Ireland
1861-71	18.1	19.5	36.2	35.0	1.7	3.9
1871-81	26.3	26.9	35.5	34.9	1.6	4.9
1881-91	22.9	24.7	32.5	32.4	1.8	5.0
1891-01	22.2	25.6	29.9	30.3	2.0	4.2
1901-11	22.5	25.1	27.2	28.4	2.1	3.9
1911-26	31.7	34.8	31.5	35.6	3.7	6.6
1926-36	19.8	20.6	15.9	19.1	3.2	4.9
1936-46	20.4	21.3	15.3	18.6	3.5	4.9
1946-51	11.1	11.0	9.0	10.0	1.6	1.9
1951-61	21.2	21.3	15.8	18.5	2.0	2.7
1961-71	21.7	22.4	17.5	18.8	2.2	3.1
1971-81	21.7	18.2	13.1	13.5	3.8	5.0
1981-91	17.6	17.3	13.2	12.9	9.5	12.4
1991-01	14.2	14.6	12.7	11.8	24.1	25.3
2001-11	15.8	13.4	12.2	10.8	32.4	36.6

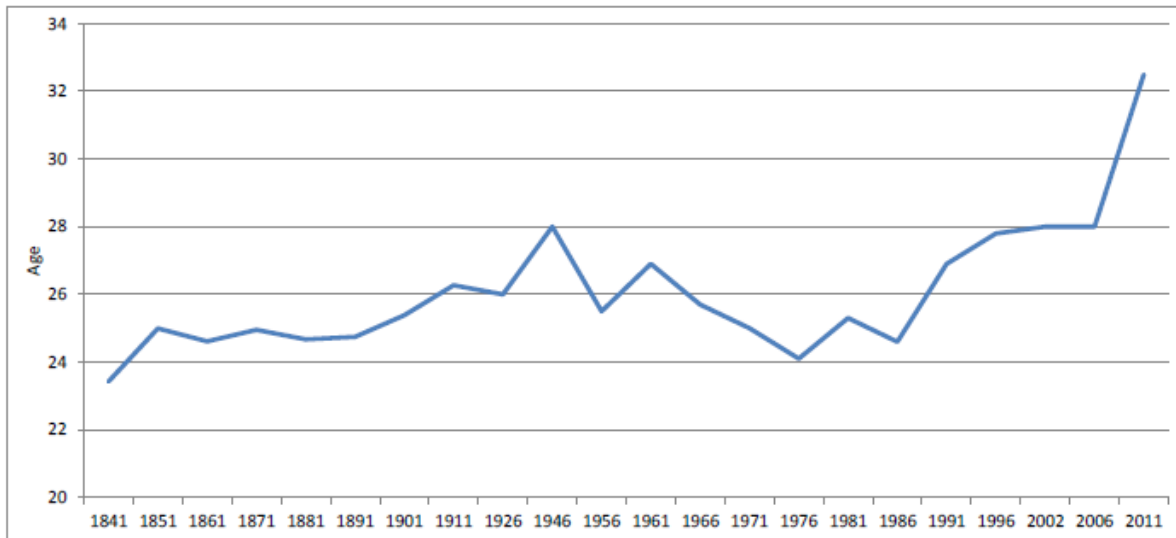
Source: Commissioner's Reports

Since 1950 the birth rate in England has been substantially below that in both parts of Ireland. The Scottish rate converged to the English rate by 1970. In the case of Northern Ireland there has been a fairly steady decline in the birth rate since 1960, while in the case of the Republic, the birth rate remained high in the 1960s, followed by a particularly marked decline in the 1980s. In recent years the data in Table 1 show that there was actually a slight increase in the birth rate in the Republic.

Understanding the factors explaining the considerable fluctuations that have occurred over time in the Irish birth rate was clearly very important for public policy. Thus a lot of attention by researchers was devoted to the evolution of fertility behaviour in Ireland over the last century and a half. This has been reflected in the number of papers to the Society over the years that have considered this issue.

The birth rate is affected by the proportion of the women in the population who are of child-bearing age and the number of children that they have over their life time. In the past, because of the very low number of non-marital births (Table 1), marriage was an important factor in understanding the pattern of fertility.

Figure 2: Average age of Women at Marriage.



Source: Commissioner's Reports and Vital Statistics.

However, in recent decades, both in Northern Ireland and in the Republic of Ireland, marriage has been of declining importance in explaining fertility as births outside marriage have become commonplace. Since the 1960s the proportion of births to unmarried women has risen dramatically, so that the decision whether to marry and, if so at what age, is no longer as useful an indicator in understanding the behaviour of fertility (Fahey and Russell, 2001).

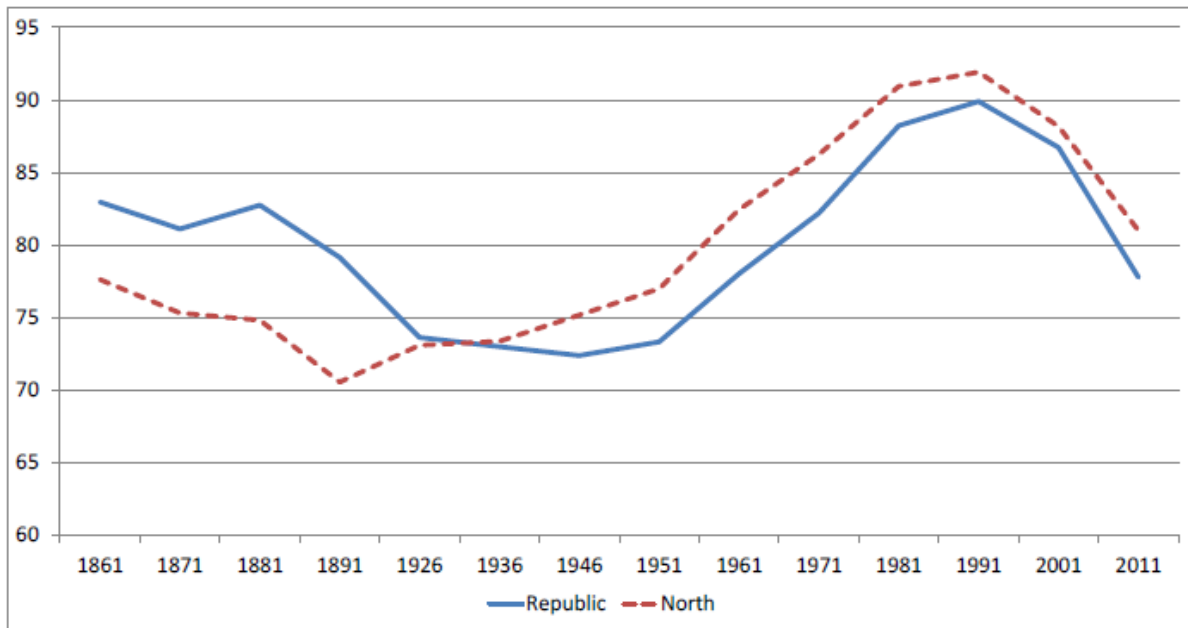
In the period to 1970, when non-marital births were rare (Table 1), the factors driving fertility can be decomposed into: the proportion of women marrying; the age at which they married; and the average number of children born to a married woman each year.

It is thought that in the years before the Famine in the 1840s the average age for women at marriage rose significantly to around 25 (O'Gráda, 1994). From 1851 to the end of the 19th century the average age at marriage for women seems to have been fairly stable in Ireland (Figure 2).¹⁰ However, from 1901 onwards the age at marriage rose significantly, peaking at 28 in 1946 in the Republic of Ireland. Again in the years after the Second World War the average age at marriage declined to 24 in 1976, its lowest level since 1841. Thereafter the age has risen continually, currently being over 32.

However, since 1970 decisions on whether to have children have increasingly become decoupled from decisions on marriage.

¹⁰ The data on age at marriage collected as part of the registration of marriages was incomplete. In the 1860s over 40% of women getting married recorded their ages. However, a continuing lament over many decades in the Commissioner's Reports was the poor response to this question. By 1900 only 15% of women replied to this question, rising to 20% by 1920. The average age quoted here is thus based on this possibly unrepresentative sample. Also in calculating the average age in the data used here marriages of women aged over 45 are excluded. Data are only available for Ireland as a whole.

Figure 3: Proportion of Women Aged 40-44 Ever Married, %



Source: Census of Ireland and Northern Ireland

In 1861 83% of women aged 40-44 had been married in the Republic of Ireland and for Northern Ireland the figure was 78% (Figure 3).¹¹ In Northern Ireland the proportion of women married continued to fall to a nadir in 1891 of just 70%. In the Republic the proportion ever married also fell over time. Walsh, 1970, shows that between 1871 and 1911 the marriage rate fell markedly in western counties. He also argues that the high rate of marital fertility acted as a deterrent to marriage.

The proportion of women marrying in the Republic continued to fall in the first half of the 20th century, reaching the lowest figure in 1946 when only 73% of women aged 40-44 had ever been married. In his 1944 paper Honohan noted that for the post 1920 period the proportion of women at all ages married in Ireland was much lower than in Great Britain. For Northern Ireland the proportion of women marrying rose continuously from 1891 for the following 100 years.

From 1951 onwards, the proportion of women marrying rose pretty continuously in the Republic, reaching a peak in 1991 in both Northern Ireland (92%) and in the Republic of Ireland (90%).

Thereafter the proportion of women marrying declined very rapidly in both jurisdictions. However, since the 1970s the decision to marry has become increasingly divorced from the decision to have children: whereas in the past marriage preceded the decision to have children, in the 1990s it appeared to follow the decision to have children (Fahey and Russell, 2001).

In his 1918 paper Thompson indicated that, between 1871 and 1911 “the fall in the birth-rate in England and Wales and Scotland is due largely to the decreased fertility of married women; reduction in illegitimacy, and postponement of marriage, also contribute to the fall. In Ireland the reduction in the birth-rate was due almost entirely to the decrease in the married women of maternity ages (15-45 years) in the population, increased age at marriage being also a factor.” He also noted that marital fertility was highest in the west of Ireland and lowest in Dublin County and Belfast city.

Thompson, 1918, also noted that marital fertility in the first 5 years of marriage in Ireland was not that different from Scotland but higher than England. However, for marriages of over 15 years duration the number of children in Ireland was much higher than in England. This suggests that in England couples, once they had a number of children, were managing their fertility in a manner that was not common in Ireland.

¹¹ By the age of 40-44 a significant proportion of the “ever married” women were widows: 13% in the Republic and 11% in the North.

Table 2: Republic of Ireland - Fertility Behaviour

	Women ever married, % Aged 35-44	Marital Birth Rate	Non-marital Birth Rate	Average age at marriage	Married women average children	Births/ Women	Potential No. of Children	TFR
1851	84.8	0.251	0.008	24.9	5.04	0.127	4.5	
1861	81.5	0.251	0.008	24.1	5.23	0.133	4.5	
1871	80.2	0.314	0.005	24.2	6.53	0.169	5.2	
1881	80.8	0.285	0.005	24.5	5.85	0.145	4.7	
1891	77.2	0.294	0.005	24.5	6.03	0.137	4.7	
1901	75.7	0.292	0.004	25.1	5.81	0.124	4.4	
1911	71.8	0.307	0.005	25.9	5.85	0.133	4.2	
1926	70.5	0.272	0.006	26.0	5.17	0.126	3.7	
1936	69.8	0.260	0.007			0.119	3.3	
1946	70.0	0.272	0.010	28.0	4.62	0.138	3.2	
1961	77.3	0.273	0.016	26.9	4.95	0.170	3.8	3.8
1971	82.5	0.140	0.089	25.0	2.79	0.122		4.0
1981	88.6	0.116	0.128	25.3	2.29	0.120		3.1
1991	88.5	0.113	0.096	26.9	2.04	0.107		2.1
2002	83.1	0.119	0.059	29.5	1.85	0.090		2.0
2011	72.9	0.121	0.041	32.5	1.51	0.074		2.0

Source: CSO Vital Statistics and Censuses. For 1841 and 1851 the marital birth rate is assumed to be the same as in 1861. For 1861 births are assumed to be similar to the number in 1865. The average age at marriage is for all of Ireland up to 1911.

In Table 2 the components of fertility behaviour are shown. In the mid-19th century the marital birth rate, calculated as the number of births to married women relative to the number of married women aged under 45, was around 0.25 (a child every 4 years). This peaked at around 0.3 between 1871 and 1911, falling gradually to 1961, and very rapidly thereafter. Given this marital birth rate, the average number of children that a married woman would have was determined by when they actually got married. In Table 2 the average number of children per married woman is calculated by multiplying the marital birth rate by the difference between the average age at marriage and 45 (age at which women are assumed to cease having children).

As discussed in Appendix 1, the data collected in the Censuses for 1911, 1946, 1971, 1981 and 2011, allow an estimate to be made of the average number of children born to women who had completed their families, here assumed to be aged 45 to 49. This measures the fertility for individual cohorts of women rather than, as in Table 2, averaging over all women aged between 15 and 45 in the Census year. The results in Appendix 1 show a similar picture to that in Table 1: of a decline from a very high level of marital fertility in the 19th century to just over 2 children per woman who had completed her family in 2011.¹²

On the basis used in Table 2, the average number of children per married woman was just over 5 in the mid-19th century, peaking at just over 6 in 1891. It was still around 5 in 1961. However, it fell rapidly over the following 20 years.

The most appropriate simple measure of fertility behaviour is probably the Total Fertility Rate (TFR). It is based on the age specific fertility rate for five year cohorts for a particular year on the assumption that a woman would experience that level of fertility over each 5 year period of her life between 20 and 45. Actual fertility for individual cohorts of women may differ significantly from this measure because, for example, of changes over time in when couples choose to have children – so that they experience different age specific fertility rates over their life time from those derived for an individual year.

¹² See Punch, 2007 for a discussion of the data for recent years.

For the Republic the TFR is only available from the mid-1950s and for Northern Ireland from 1981. Here we use a supplementary measure for the period from 1851 to 1961. This takes a weighted average of the average number of children of married and unmarried women and is here referred to as “potential number of children” (Table 2). This measure can differ significantly from the TFR, although for 1961 they are, coincidentally, identical for the Republic of Ireland. While inferior to the TFR, this alternative measure has the advantage that it can be used to summarise the broad changes in fertility behaviour over the period 1851-1961.

On this basis, fertility peaked in 1871 at over 5 children per woman in the Republic. Thereafter it fell over the rest of the 19th century because of a slow rise in the age at marriage and a fall in the proportion of ever married women (Thompson, 1919). Over the first half of the 20th century there was a continual fall in fertility up to 1946. This was driven by some reduction in the fertility of married women, implying increasing management of fertility by a minority of couples but, of even more importance, was the rising age at marriage.

Between the end of the Second World War and 1961 marital fertility remained fairly unchanged at a high level. However, the proportion of women marrying rose significantly and the age at marriage began falling with a consequential increase in the “potential number of children”.

Between 1961 and 1971 the increasing availability of methods of controlling fertility is suggested by the fall in the marital birth rate. Nonetheless the TFR remained high in 1971 at 4. It is after 1971 that there is a rapid fall in fertility, with the TFR in 1981 being only just over 3. In the decade to 1991 it fell further to 2 and has remained around that level in the subsequent 25 years.

As Fahey and FitzGerald (1997) discuss, there were considerable differences in regional fertility within the Republic, with fertility in Connacht and Ulster (3 counties) falling more slowly than in Dublin post 1960. Thus a factor in the rapid fall in fertility was the change of Ireland in the post-war years from being predominantly rural to being predominantly urban.

Table 3: Northern Ireland - Fertility Behaviour

	Women ever married	Marital	Non-marital	Average age	Married women	Births/	Potential No.	TFR
	%							
	Aged 35-44							
1851	79.1	0.298	0.014	24.9	6.0	0.153	4.5	
1861	63.9	0.298	0.014	24.1	6.2	0.132	4.1	
1871	61.7	0.293	0.020	24.2	6.1	0.154	4.1	
1881	60.0	0.292	0.012	24.5	6.0	0.137	3.9	
1891	56.4	0.301	0.011	24.5	6.2	0.134	3.8	
1901	52.4	0.285	0.008	25.1	5.7	0.125	3.0	
1911	56.3	0.268	0.010	25.9	5.1	0.128	2.9	
1926	65.7	0.232	0.011	26.0	4.4	0.121	2.9	
1936	65.4	0.200	0.010			0.108	2.5	
1951	74.7	0.194	0.008			0.120	2.8	
1961	80.0	0.161	0.019			0.117	2.5	
1971	87.0	0.103	0.107			0.104		
1981	89.9	0.078	0.158			0.097		2.6
1991	86.6	0.079	0.091			0.083		2.2
2002	77.7	0.098	0.057			0.077		1.8
2011	65.0	0.123	0.044			0.074		2.0

Source: NISRA and Censuses. For 1841 and 1851 the marital birth rate is assumed to be the same as in 1861. For 1861 births are assumed to be similar to the number in 1865. The average age at marriage is for all of Ireland up to 1911. Data on age at marriage are not available for Northern Ireland from 1926.

Table 4: Proportion of women ever married, %

Age	Republic			Northern Ireland		
	30-35	35-40	40-45	30-35	35-40	40-45
1861	70.6	79.4	83.0	64.9	74.1	77.6
1871	72.3	79.1	81.1	63.3	71.1	75.3
1881	70.1	78.4	82.7	61.6	70.1	74.8
1891	64.6	74.9	79.1	58.2	64.6	70.6

Source: Census of Ireland, 1861-1891.

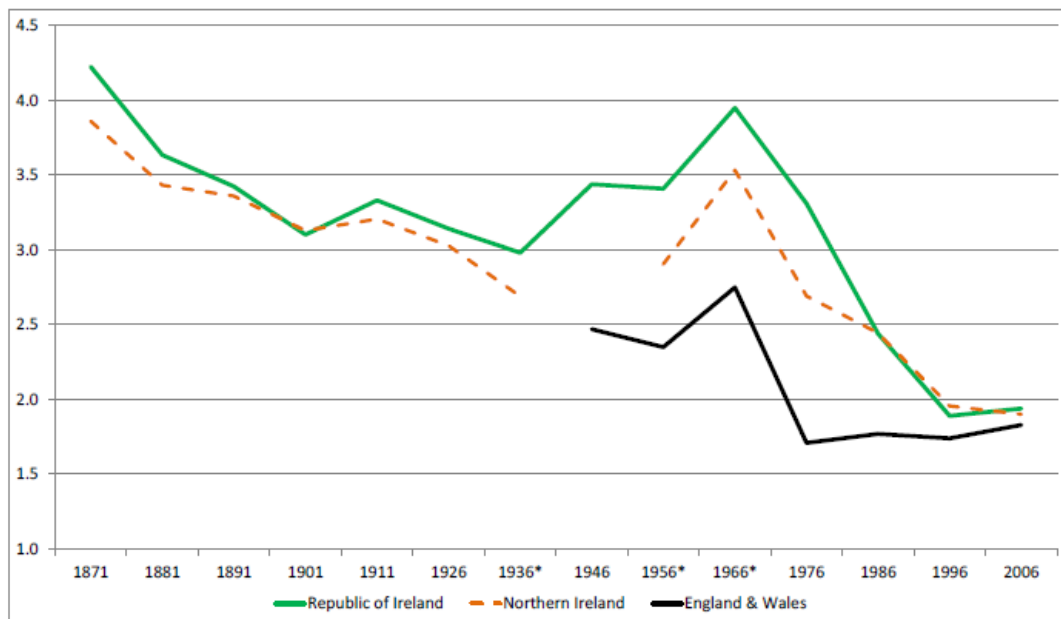
The really big difference between Northern Ireland and the Republic of Ireland in the 19th Century was the very much lower proportion of women aged between 35 and 44 shown as being ever married in Northern Ireland (Tables 2 and 3). The cohort of women aged 35-44 is used in these Tables because some censuses do not allow a finer distinction in terms of age. However, more detailed data are available from the 1851-1891 Censuses, which paint a slightly more complex picture.

As shown in Table 4, in the Republic between 1851 and 1891 the proportion of women married aged between 35 and 39 was on average just 3.5 percentage points lower than for the 40-44 year olds. However, in Northern Ireland the gap was 4.6 percentage points, with the gap in 1891 being 6 percentage points. This suggests that the major difference between Northern Ireland and the Republic was that the age at marriage was higher in Northern Ireland and that it also rose more rapidly over the second half of the 19th century than in the Republic. This indicates that, if separate data for Northern Ireland and the Republic of Ireland on age at marriage were available, it would show a rather different picture from that depicted in Tables 2 and 3. In the absence of such data, the likelihood of a higher and rising age at marriage in Northern Ireland must be taken into account.

On the assumption of an identical age at marriage between the Republic of Ireland and Northern Ireland, marital fertility was higher in Northern Ireland in the immediate aftermath of the famine but it settled down at a similar level to the Republic up to 1901. However, if as seems likely, the age at marriage was higher in Northern Ireland than in the Republic, that would imply a higher level of marital fertility in Northern Ireland over the second half of the 19th century than is shown in Table 3. However, from the beginning of the 20th century marital fertility fell in Northern Ireland taking it significantly below the Republic from 1926 onwards.

Because a smaller proportion of women married in Northern Ireland than in the Republic, the population wide fertility (measured by what is termed “potential number of children”), was much lower than in the Republic. Even though the proportion of non-marital children born in Northern Ireland was significantly higher than in the Republic for most of the period, the numbers were still small relative to the births to married women.

Figure 4: Measures of Total Fertility



Note: The series are the Total Fertility Rate for England and Wales from 1946, and for the Republic and Northern Ireland from 1961. Prior to that, the series are what is termed “potential number of children”.

In the post-war years the proportion of women marrying rose in both jurisdictions to rather similar levels. However, because of a much higher marital birth rate in the Republic, the TFR was much greater than in Northern Ireland up to and including 1981 (Figure 4). It is only since 1991 that the TFRs in the two jurisdictions have converged.

As shown in Figure 4, the TFR in the Republic of Ireland was very much higher than that in England and Wales in the post-War years up to the 1990s. Northern Ireland, while having a lower TFR than in the Republic, also had a much higher level of fertility than in England and Wales until the 1990s. Since then the TFR for both parts of Ireland and for England and Wales have been very similar, though substantially higher than in most of the rest of the EU.

4. RISING LIFE EXPECTANCY

Probably the single most important aspect of the rise in quality of life in Ireland over the last 150 years has been the rise in life expectancy. At the beginning of the period under consideration the Great Famine had had a devastating impact on the population, resulting in a massive increase in the number of deaths, above even what would have been normal for the time. Unfortunately, there was no registration of deaths and, even if there had been, any administration might have been swamped by the catastrophe that had occurred. Thus we don't know the precise number of excess deaths.

Table 5: Life Expectancy at Birth, years

	Male				Female			
	Ireland	England & Wales	Scotland		Ireland	England & Wales	Scotland	
1871	49.6	41.2	41.0		50.9	44.5	43.8	
1881	49.4	43.8	43.9		49.9	47.0	46.3	
1891	49.1	44.3	44.7		49.2	47.8	47.4	
1901	49.3	48.1			49.6	51.9		
1911	53.6	45.1	50.1		54.1	55.2	53.2	
	Republic		Northern Ireland		Republic		Northern Ireland	
1926	57.4	57.3	53.1	55.3	57.9	61.3	56.4	55.7
1936	58.2	60.8	56.0	57.7	59.6	65.1	59.5	58.6
1941	59.0	58.2	59.8	58.7	61.0	66.3	64.6	60.0
1951	64.5	66.9	64.4	66.0	67.1	72.1	68.7	67.8
1961	68.1	68.2	66.2	67.8	71.9	74.2	72.0	70.2
1971	68.8	69.2	67.3	67.3	73.5	75.4	73.7	70.5
1981	70.1	71.3	69.1	69.6	75.6	77.2	75.3	72.8
1991	72.3	73.6	71.4	72.6	77.9	79.0	77.1	75.6
2001	75.1	76.2	73.3	75.5	80.3	80.7	78.8	78.0
2006	76.8	77.7	75.0	76.4	81.6	81.8	79.8	78.9
2011	78.4	79.0	76.8	78.1	82.8	82.8	80.9	82.4

Source: Ireland and Republic: CSO web site File VSA30. Northern Ireland: http://www.mortality.org/hmd/GBR_NIR/STATS/fltper_1x5.txt and NISRA web site. Scotland: <http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/life-expectancy/life-expectancy-at-scotland-level/scottish-interim-life-tables>

The Famine resulted in very large population movements, as emigration dramatically increased. Thus decomposing the decline in the population into a fall due to excess deaths and a fall due to emigration is an imprecise exercise. This also means that calculating life expectancy for the famine years is not feasible. However, from 1861 onwards it is possible to make an estimate of how life expectancy changed over the subsequent century and a half.

The first published estimate of life expectancy for the island of Ireland is available for 1871. Regular estimates are available thereafter up to the present day. As described in Appendix 2, the 1926 Life Tables have been adjusted to reproduce the published life expectancy for 1871 and subsequent years. Not surprisingly, when applied to the population data from the Census, the estimated life tables roughly reproduce the recorded number of deaths. However, if the estimated life tables for 1871 are applied to data for 1851 and 1861 they also roughly fit the known demographic data for those years. This suggests that life expectancy, which had fallen dramatically as a result of the Famine, recovered in the 1850s and was roughly unchanged between 1851 and 1871.

Table 5 shows the life expectancy at birth for men and women roughly every decade from 1871 to 2006. The life expectancy data for the period up to 1911 are for the island of Ireland. From 1926 onwards separate data are available for Northern Ireland and the Republic. Comparative data are also shown for England and Wales.

The data for the 19th century show a very significant difference between the life expectancy of men and women in Ireland compared to their counterparts in England and Wales. At birth men in Ireland had a higher life expectancy of over 8 years compared to England and Wales and for women the advantage was over 6 years. The gap in Ireland's favour for men was still substantial in 1911. However, for women there had been a rapid improvement in life expectancy in England and Wales

Over the period 1871-1911, the significantly higher life expectancy at birth in Ireland compared to England and Wales was due to the fact that the Irish population generally lived in rural areas. With infectious diseases being a very important cause of premature death, there was a big difference between life expectancy in the cities and rural areas for both Ireland and Great Britain.

Table 6: Relative Mortality

If less than 1 then mortality in the Republic is lower than in Northern Ireland

	1926	1936	1951	1961	1971	1981	1991	2002	2006
Males									
0	0.87	0.9	1.04	1.03	0.86	0.78	1.08	1.05	0.66
1-14	0.84	0.94	1.25	1.08	0.98	1.07	0.97	0.98	0.77
15-34	1.05	1.06	1.24	1.01	0.9	0.81	0.99	1.13	0.86
35-64	0.93	0.99	0.99	0.92	0.92	0.91	0.96	1	0.82
65+	0.87	0.87	1.02	0.99	0.97	1.01	1.05	1.05	1
Females									
0	0.94	0.86	1.04	1	0.87	0.82	1	1.15	0.77
1-14	0.82	0.92	1.44	1.15	1.04	0.98	0.81	1.36	0.86
15-34	0.97	1.11	1.5	1.29	1.14	0.81	1.1	1.05	0.95
35-64	0.92	0.98	1.08	1.09	1.05	0.94	0.95	0.96	0.9
65+	0.88	0.87	1.03	1.02	1.07	1.06	1.06	1	0.97

Source: Hall, 2013

Table 6, taken from Hall, 2013, shows relative mortality rates¹³ for the Republic and Northern Ireland over the 20th century. For males, at birth mortality rates were lower in the Republic than in Northern Ireland for most of the period. The exception was 1961 and 1971. This advantage for Northern Ireland in 1961 and 1971 was even higher for males aged between 1 and 34, while mortality rates at older age groups were very similar. However, by 2006 mortality rates in the Republic at all ages under 65 were lower than in Northern Ireland, though the figures for the differential at younger ages may reflect the fact the numbers involved were very small.

For women at the beginning and the end of the 20th century mortality rates were lower in the Republic than in Northern Ireland. However, a big gap opened up between Northern Ireland and the Republic between 1951 and 1971 for mortality rates for women aged between 1 and 34: rates were much lower in Northern Ireland in those years. As discussed later, among other factors, this reflected a much more rapid improvement in maternal death rates in Northern Ireland in the middle years of the 20th century.

In considering the factors giving rise to differences in the mortality rates in Ireland and Britain, Thompson, 1919, noted that there had been a huge fall in the number of deaths from infectious diseases in England and Scotland in

¹³ In Hall, 2013, the death rates in each year are based on the average of the number of deaths in each age group in the three calendar years centred on the census years. The fluctuations in mortality rates for 2006 may be due to the small number of deaths in the very young age groups.

previous decades. While there had also been a decline in Ireland, it was less rapid, though even in 1911 the death rate from infectious diseases in Ireland was still below England and Scotland.

Honohan, 1944, also commented on the relative mortality rates: “The similarity between the Éire and the Northern Ireland rates, especially at the early ages, should be noted, as also the favourable male rates compared with the English and Scottish, particularly at the older ages. It is surprising, however, to observe that the Éire female rates at the important ages are rather less favourable than the British female rates, which, incidentally, are materially lower than the British male rates.”

Hall, 2013, provides a comprehensive analysis of the trends in the 20th century: “The most dramatic drop occurs for infectious diseases, with an approximate 98% fall in the directly standardised death rate between 1926 and 2006 for both males and females.”

Over the last twenty years there has been a particularly rapid increase in male life expectancy in both the Republic and Northern Ireland (Table 6). To some extent this reflects a catching up on the improvement in female life expectancy, which had improved very substantially between 1961 and 1991. Walsh, 2008, commented that:

“The most striking feature is the rapid convergence of the Irish age-standardised rate on the EU-15 average after 1999. Structural breaks in the trend are evident in the crude death rate and even more markedly in the death rate among those aged 75 and over and for deaths from respiratory and cerebrovascular illnesses and IHD. A significant part of the decline in these death rates reflects reduced seasonality and an especially steep fall in deaths in the winter months.”

Layte et al. (2010) attributed part of the drop in deaths due to circulatory causes to increased cardiovascular prescribing and improvements in access to healthcare for older people with the introduction of the medical card in 2001, which provided free healthcare to those aged 70 and over in Ireland. The drop in road deaths has also probably improved life expectancy at younger ages.

Table 7: Maternal Death Rate per thousand live births

	Ireland	Northern Ireland	England & Wales	Scotland	UK
1870-02	6.84	4.97	4.86		
1880-02	7.35	6.27	4.70		
1890-02	6.29	6.21	5.34		
1900-02	6.37	6.03	4.67	4.74	4.71
1910-12	6.00	5.28	3.67	5.65	3.95
1920-22	5.76	5.62	4.03	6.36	4.37
1930-32	4.93	5.24	4.24	6.40	4.54
1940-42	3.12	3.79	2.74	4.50	3.29
1950-52	1.54	1.09	0.79	1.09	0.88
1960-62	0.49	0.43	0.36	0.37	0.36
1970-72	0.32	0.12	0.17	0.17	0.17
1980-82	0.06	0.06	0.09	0.14	0.09
1990-92	0.05	-	0.07	0.10	0.07
2000-02	0.05	0.05	0.06	0.12	0.07

Source: Registrar General’s Reports (Ireland and Northern Ireland) and CSO: Vital Statistics

Table 8: Infant Mortality

	Republic of Ireland		Northern Ireland		England & Wales		Scotland
	Total	Non-marital	Total	Non-marital	Total	Non-marital	Total
1864-66	96.0		98.7		157.7		124.3
1870-02	99.7		78.3		156.0		125.7
1880-02	94.7		112.4		141.3		118.7
1890-02	94.3		107.8		149.3		125.3
1900-02	98.3		113.4		146.0		123.3
1910-12	87.6		101.2		110.0		108.3
1920-22	73.0	315.3	86.1	196.5	80.0	132.5	94.3
1930-32	66.4	261.7	74.7	149.0	63.3	105.0	83.7
1940-42	69.7	242.6	79.6	168.7	55.7		76.7
1950-52	44.3	78.5	40.2	57.0	29.3		37.0
1960-62	29.7	71.3	27.1		21.7		26.3
1970-72	18.3		22.0		17.7		19.7
1980-82	10.7		13.4		11.3		11.3
1990-92	7.3		7.0		7.3		7.3
2000-02	5.7		5.3		5.3		5.7
2010-12	3.6		4.6		4.0		4.0

Source: Registrar General's Reports (Ireland and Northern Ireland) and CSO: Vital Statistics

While life expectancy at birth was higher in Ireland, North and South, than in Britain in the 19th century, maternal death rates were consistently worse in Ireland (Table 7). While maternal death rates fell in the Republic after 1920, in the inter-war years they fell more slowly in Northern Ireland.

As a result, by 1940 maternal death rates in the Republic and Northern Ireland were still significantly higher than in Britain. However, between 1940 and 1950 there was a dramatic improvement in Northern Ireland, leaving the higher rates in the Republic appear as an outlier. It was only over the course of the 1980s that maternal death rates fell faster in the Republic than in Britain to take them slightly below British rates by 1980. Today maternal death rates are fairly similar in Ireland and Great Britain.

In the 19th century the infant mortality rate was very much lower in Ireland, North and South, than in Great Britain (Table 8). Over the period 1864-1900 it changed little in the Republic of Ireland, though it rose significantly in Northern Ireland. A factor in this difference was probably that the Republic of Ireland was a more rural society. In the Commissioner's reports comparative data were shown for infant mortality in Dublin, Belfast and certain British cities. This made it clear that the urban infant mortality rate was not that different in Ireland to that in Britain.

From 1900 onwards the infant mortality rate began to decline in all parts of the then United Kingdom. However, the decline was more rapid in England and Wales than elsewhere, so that by 1930 the rate there was just below the rate in the Republic. Northern Ireland and Scotland still lagged behind.

However, there was a much more rapid improvement in infant mortality rates between 1930 and 1950 in Northern Ireland and Great Britain so that by 1950 the Republic was lagging behind. This pattern replicates that in maternal death rates where the middle years of the 20th century saw Ireland fall behind the regions of the United Kingdom

on a range of measures of life expectancy. This gap between the Republic and the UK may reflect the early benefits of the National Health Service contrasting with only slow changes in provision of health services in the Republic.

However, as with maternal death rates and other measures of life expectancy, major improvements occurred in the Republic of Ireland from the late 1970s, so that today the infant mortality rate in the Republic is, if anything, marginally lower than that in the UK. McGovern, 2016, considers this issue in more detail.

What these data show is that the independent Republic of Ireland performed poorly on a number of metrics related to life expectancy from 1930 to 1960, mirroring a worse economic performance. However, there was a catching up process from the late 1970s and today, using the same metrics, the Republic has a rather similar profile to that of the UK.

Over a century and a half, the one significant departure from its objective description of the data occurred in the 1923 Registrar General's Report. In that Report, the first for the new Irish Free State, a new section was introduced examining infant mortality among non-marital (illegitimate) children. As shown in Table 8 this showed that the death rate among such children was over a third, whereas for the population as a whole it was around 7%. The Report comments: "These rates must be regarded as excessive."

The Registrar also obtained the data for infant mortality among non-marital children in Northern Ireland and England.¹⁴ As shown in Table 8, while also exceptionally high, the death rate in Northern Ireland was between a half and two thirds of what it was in the Republic. In England and Wales it was 40% of what it was in the Republic. Thus such children suffered a much higher death rate across the British Isles, but the rate for the Republic was quite exceptional.

The Report comments that "the mortality among illegitimate infants is much in excess of that for all infants, as shown in Table X., especially at the age-periods one and under 2 months and 2-3 months." The report also shows that over 70% of these children died in institutions spread around Ireland rather than in the home. The most common cause of death among such children was listed as "Atrophy, Debility, Marasmus"¹⁵ accounting for a third of deaths. Deaths from "Diarrhoea and Enteritis" accounted for something under 20% of such deaths.

The Registrar's reports continued to publish the tables on infant mortality among non-marital children and to draw attention to these data up to the early 1940s. However, as shown in Table 8, there was very little improvement in the situation between the early 1920s and 1940, in spite of the annual publication of the data. Publication of these tables ceased in the 1940s. However, as shown in Table 8, data were published for some years in the 1950s and early 1960s which show a very significant improvement, though the infant mortality rate for such children was still much higher than for the population as a whole.

5. EMIGRATION

There are two sources for data on emigration in the 19th century and the early years of the 20th century. The first source takes the Census figures and adds the births over the subsequent decade and deducts the deaths to give the population change due to the natural increase. The difference between this figure and the actual census figure is a measure of the net emigration over the inter-censal period.

The second source is based on an enumeration of those leaving Irish or British ports, generally for destinations outside Europe, especially the US. These data were published annually in the Registrar General's reports up to the 1920s. The data were based on lists of passengers, which included details of the address in the UK of the person leaving – hence emigration from Ireland is counted even if the individuals were leaving from a British port. These data reflect gross emigration, which will overestimate net emigration. However, these data also may not include many of those who emigrated from Ireland to Great Britain.¹⁶

From the 1920s onwards the annual net emigration figures for the Republic have been calibrated so that they coincide with the estimate of net emigration derived from the Census. For the pre-1926 period they represent an independent source of information, although subject to the defects described. In discussing the broad outline of emigration over the century and a half the Census based figures are preferred in this paper.

¹⁴ In the following year the Registrar's report for Northern Ireland copied that for the Republic and introduced a similar section on infant mortality among non-marital children.

¹⁵ Marasmus is a form of severe malnutrition characterised by energy deficiency. A child with marasmus looks emaciated.

¹⁶ The Commission on Emigration, 1955, derives estimates of emigration to Great Britain based on the data in the Registrar General's reports.

The pattern of emigration from Ireland was already established at the end of the 18th century (Ó'Gráda, 1994). Emigration continued to grow over the early decades of the 19th century. The disaster of the Famine in the 1840s saw a massive increase in the numbers leaving. Even with a recovery of the economy in the second half of the 19th century, emigration continued at a high level. The emigration rate for Ireland in the second half of the 19th century was at least twice the rate experienced in any other European country (Hatton and Williamson, 1993).

Emigration continued to be a major factor driving demographic change over the 20th century, both in Northern Ireland and in the Republic. It is only since 1970 that this pattern has been reversed in the Republic of Ireland, and in Northern Ireland it only turned to a net inflow in the 1990s (Registrar General, 2014).

As the stock of Irish emigrants grew in their chosen destination (in particular the US), this facilitated the future emigration of relatives and friends. Emigrants often provided the finance for family members to follow them to the US. While the Famine years were a time of exceptional hardship, the very big gap in living standards between Ireland and the US (or Great Britain) continued to be a key factor driving emigration for much of the following century and a half.

The importance of economic factors in explaining migration patterns in Ireland has been analysed in quite a number of papers (Walsh, 1968 and 1974, Honohan, 1992, Bradley *et al.*, 1993, Bergin *et al.*, 2013). However, emigration also played a very important role in raising living standards for those who remained in Ireland. Geary said of emigration that "It has been a powerful contributory factor to the prodigious increase in the standard of living in Ireland during the last hundred years." (Brennan *et al.*, 1938). More recent research by Hatton and Williamson, 1993, confirmed Geary's hypothesis.

In the 1938 symposium of the Society, which was broadcast live, O'Brien said "there is a danger of the more energetic and enterprising departing and of the less vigorous and ambitious remaining behind." (Brennan *et al.*, 1938) This has also been a continuing concern over the decades. It was an especially important issue for policy makers at the time of the surge in emigration in the late 1980s.

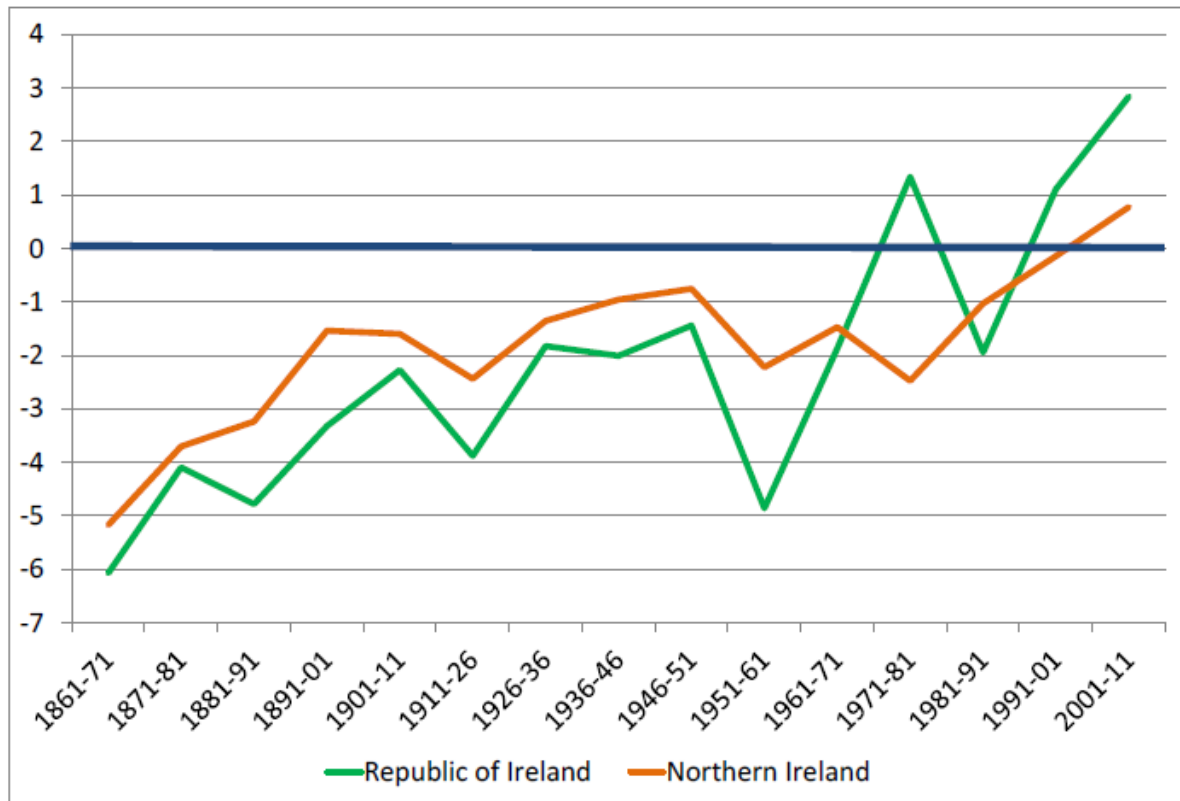
Research has shown that in the last forty years a significant proportion of those who emigrate eventually return to Ireland (Fahey, *et al.*, 1997). The propensity to return was particularly high for those with third level education. Research by Barrett *et al.*, 2012, also indicates that those who return tend to earn more in Ireland because of the experience that they gained from working abroad.

Fahey, *et al.*, 1997, describe how in 1991 between 10% and 15% of all the adult male population were returned emigrants and around 30% of those aged 40 and over with a third level qualification had lived abroad. The 1996 Census showed that for the 30-34 population cohort almost 20% were returned emigrants, illustrating how many who left in the surge in emigration in the late 1980s returned within ten years. Unfortunately we don't have similar data for the 19th century or the first half of the 20th century, but there is evidence that even in the 19th century a minority of emigrants did eventually return.

The annual data on emigration published in the Registrar General's reports in the 19th century gave details of the age of emigrants, showing that between 1864 and 1899 77% were aged between 15 and 34.¹⁷ This pattern continued up to the second half of the 20th century (Keating, 1977 and Fahey *et al.*, 1997). As a result, using the Census based method to estimate emigration between Censuses, Figure 5 shows the pattern of net migration since 1851, where emigration is expressed as a share of the population aged 15-34.

¹⁷ As noted earlier, these data only cover emigrants to locations outside Europe, especially the US.

Figure 5, Average Annual Emigration as a percentage of the Population aged 15-34.



Source: Emigration is derived from successive Censuses as a residual after accounting for births and deaths.

As shown in Figure 5, in the 1860s between 5% and 6% of young people aged between 15 and 34 emigrated each year so that, over the decade, up to half of that cohort left Ireland. In the 1870s the rate of emigration fell to around 4% of the cohort each year in both the North and the Republic, representing up to 40% of the cohort over the decade.

Thereafter a significant gap opened up between the emigration rates in Northern Ireland and the Republic. In the 1880s the emigration rate increased slightly in the Republic whereas it fell to 3% a year in Northern Ireland. The following two decades saw a reduction in emigration, both North and South, to between 1.5% and 2.5% of the cohort emigrating each year in the 1900s.

Independence in the Republic in 1922 saw a significant increase in emigration – around 4% a year of the cohort aged between 15 and 34. The annual series published in the Registrar General’s report indicates that emigration had been very low during the War years so that the rate of emigration from the Republic in the 1920-1925 period was particularly high. While emigration also rose in Northern Ireland, the increase was much smaller than in the Republic.

For the period 1911-1926 there is a big difference between the census based estimate, reflecting net emigration to all destinations, and the Registrar General’s statistics which cover gross emigration, primarily to the US. This implies that between 100,000 and 200,000 people emigrated to Great

Britain, primarily in the period 1919-1926. A significant part of this outflow may have occurred as a result of the war of independence and independence itself.

The 1926 to 1951 period saw continuing emigration with the pattern of lower rates for Northern Ireland being maintained. However, where the contrast between Northern Ireland and the Republic’s experience is particularly striking is in the 1950s: approximately half of the relevant cohort emigrated from the Republic in that decade whereas only 20% emigrated from Northern Ireland. This reflected very different economic performances in the two parts of Ireland.

It was in the 1970s that the first major reversal of migration flows happened in the Republic of Ireland. Membership of the EEC saw rapid economic growth in the early years of the decade and a significant number of

emigrants, who had left over the previous two decades, returned. In addition, there was a substantial increase in the population in Ireland who were born in Great Britain, probably many of them the children of returning emigrants. By contrast, there was a significant net outflow from Northern Ireland in the 1970s and 1980s, presumably because of the “Troubles”, an outflow which was only reversed in the 1990s.¹⁸

Throughout most of the last century and a half those who emigrated tended to be less skilled and less well educated than the population as a whole (Commission on Emigration, 1955). However, there was a significant change in behaviour in the 1980s (Fahey, *et al.*, 1997). At the beginning of the decade emigrants, generally moving to the UK, on average had relatively limited education.

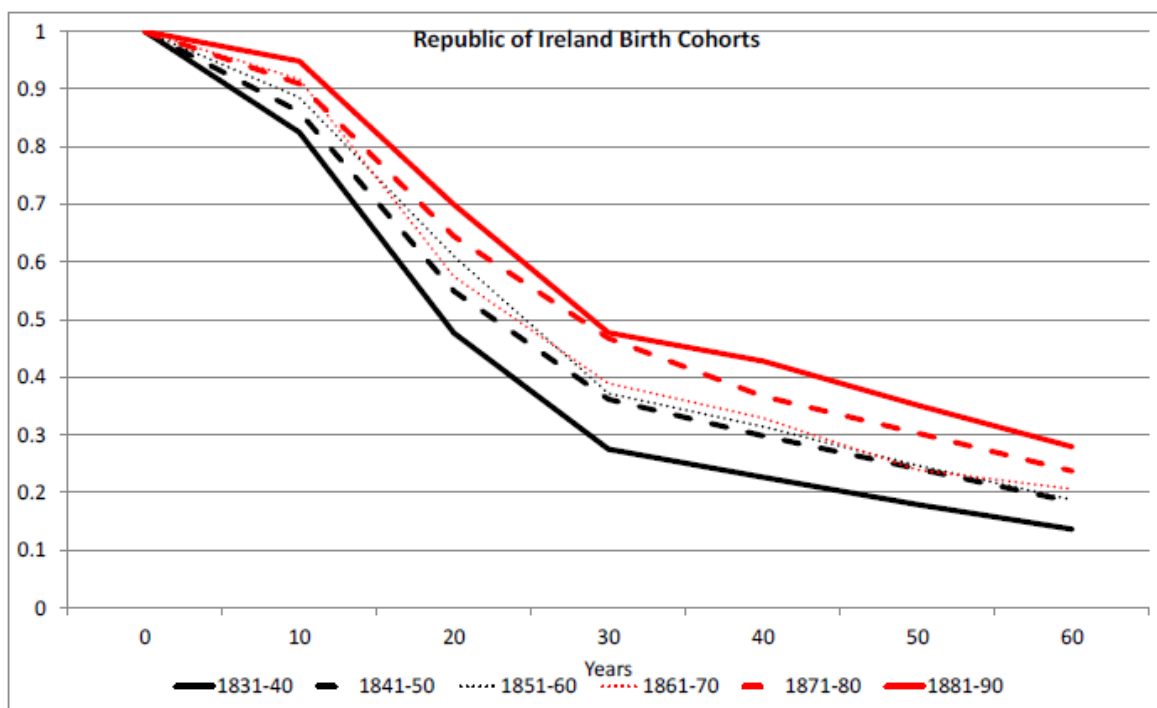
However, by the end of the decade emigrants were generally the better educated within the cohort. This was partly driven by changes in the Irish and UK welfare systems which meant that Irish people with poor labour market prospects were better off in Ireland than in the UK (Garvey and Maguire, 1989).

Substantial inflows of immigrants into the Republic began in the second half of the 1990s reflecting a very large increase in the demand for skilled labour. In this case immigrants tended to be well educated relative to the Irish population (Barrett, *et al.*, 2002). After EU enlargement in 2004 the inflow of immigrants stepped up a gear. (There was a similar inflow into Northern Ireland in the middle years of the 2000s). While less well educated than the immigrant inflow before 2004, they were still well educated relative to the existing Irish population. This influx of immigrants had a significant effect on the composition of the population. While between 1981 and 1996 the proportion of the Irish population who had been born outside Ireland was steady at around 7.5%, by 2011 this had risen to 17% of the population.

6. THE EXPERIENCE OF SUCCESSIVE POPULATION COHORTS

As discussed earlier, while mortality rates and life expectancy were dramatically worse than they are today, in the post-famine years they were not exceptional when compared to figures for Great Britain. However, the key features of Irish demography in the 19th century that made it unusual in a European context were the exceptional death rate in the 1840s, as a result of the Famine, and the continuing high rate of emigration over the whole century. The proportion of the population that emigrated in the second half of the century from both Northern Ireland and the Republic was the highest in Europe (Hatton and Williamson, 1993).

Figure 6: 19th Century Birth Cohorts – Republic of Ireland



The combined effect on the Irish population of high emigration and high rates of mortality at younger ages can be illustrated by the tracking the proportion of individual birth cohorts that were alive and living in Ireland in

¹⁸ For a comparison of Northern Ireland and the Republic of Ireland see Courtney, 1995.

subsequent decades. Because of the tendency, discussed earlier, for people over 20 to round their ages in the Census this exercise is best carried out with ten year birth cohorts – for example those born between 1831 and 1840. Where the Census took place at ten year intervals, as in the 19th century, this is easy to do. However, the break in the series because of the abandonment of the 1921 Census poses some problems. In addition, because of the irregular nature of the Censuses of the first half of the 20th Century in Northern Ireland, a similar exercise for that jurisdiction in the 20th century is not feasible.

Figure 6 shows the proportion of each birth cohort, from the 1830s through to the 1880s that were still alive and living in the Republic of Ireland in each of the 6 decades subsequent to their birth. The 1830s and 1840s birth cohorts were particularly affected by the famine. The exceptional death rate of the famine years, combined with a surge in emigration, meant that 20 years on only around 50% of them were alive and living in Ireland. Thirty years on (when they were between 30 and 39) the proportion still alive in Ireland had fallen to well under 30%, reflecting further emigration after the Famine.

For those born after the famine a significantly higher proportion of each cohort were still alive in Ireland after 10 years, reflecting the lower death rate after the famine. However, for these cohorts the attrition due to emigration was, if anything, higher so that for those born between 1851 and 1870, thirty years on the same proportion were living in Ireland (just under 40%) as for the cohort born during the famine years – 1841-1850. It is only with the cohorts born between 1871 and 1890 that around 50% of them were still alive in Ireland after 30 years, due to the lower rates of emigration from 1890 onwards.

Figure 7: 19th Century Birth Cohorts – Northern Ireland

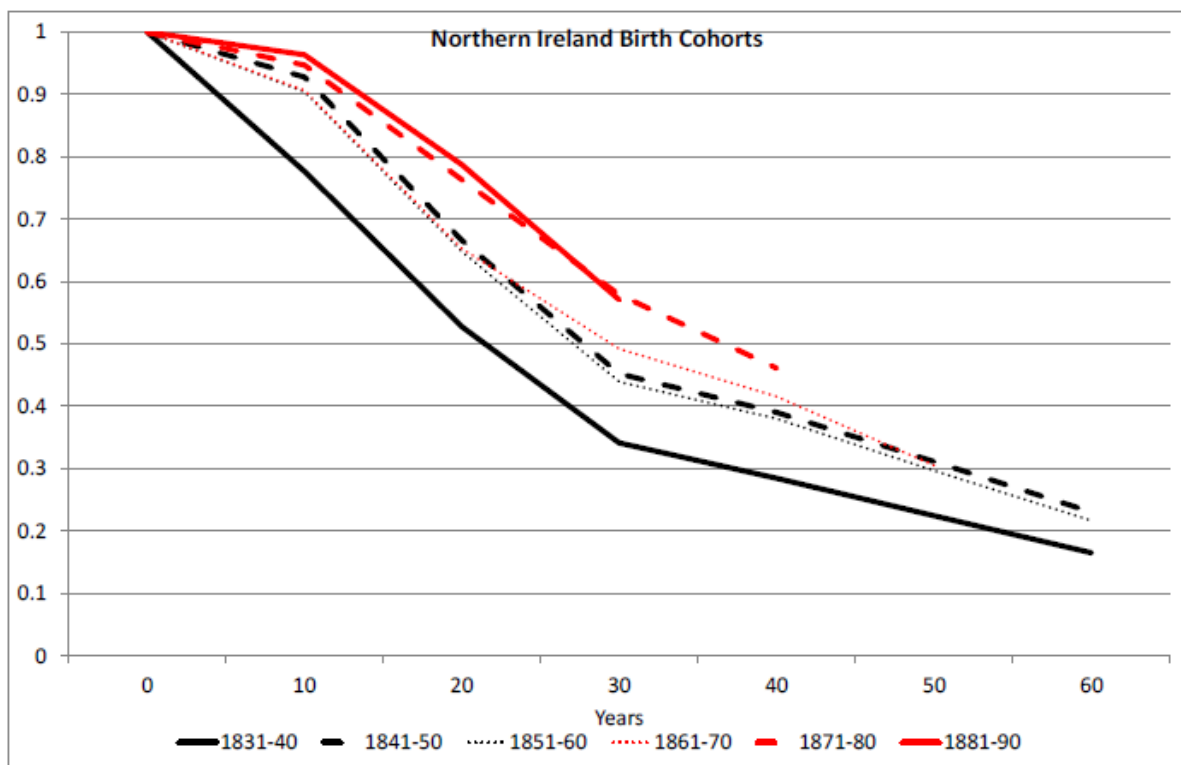
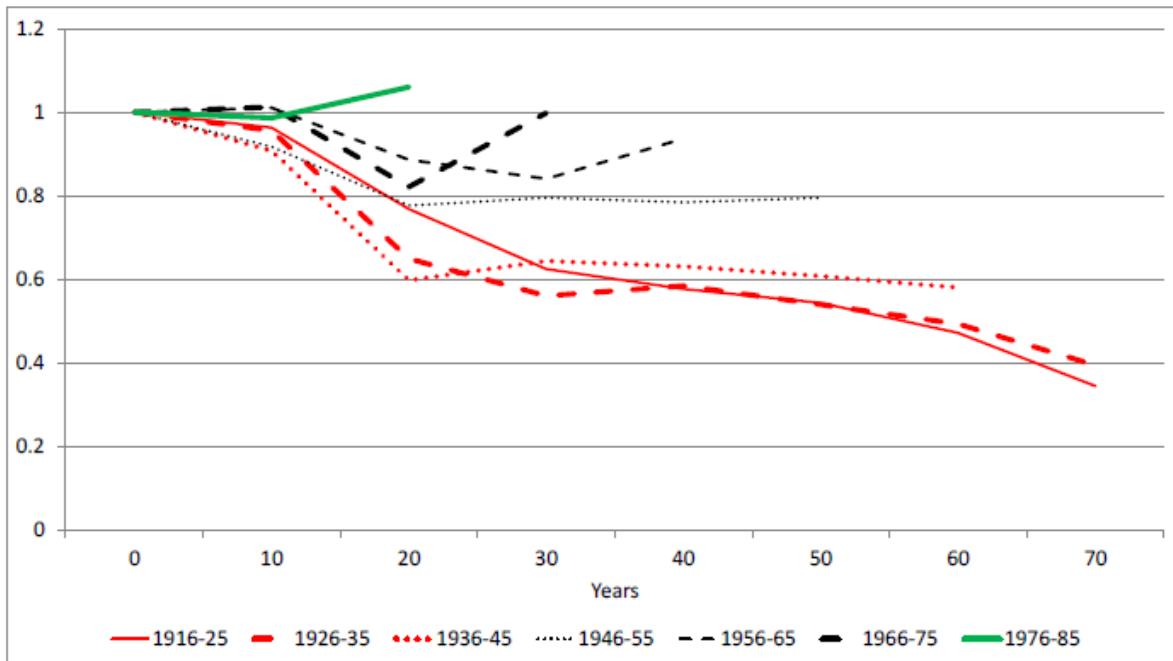


Figure 8: 20th Century Birth Cohorts – Republic of Ireland



For Northern Ireland, the survival pattern for those born between 1831 and 1840 looks very similar to that for the same cohort in the Republic (Figure 7). After 10 years, in 1841, approximately 80% were still alive and living in Ireland. The famine years seem to have exacted a lower toll than in the Republic. However, 30 years on, in 1861, just over 30% of this cohort were still alive in Ireland, marginally higher than for the same cohort in the Republic. This implies a higher rate of emigration from Northern Ireland post-famine.

The experiences of the cohorts born between 1841 and 1870 were fairly similar to each other, with between 40% and 50% still alive in Ireland after 30 years. This is somewhat higher than in the Republic for the same cohorts, where under 40% of these cohorts survived in Ireland. For those born between 1870 and 1890 almost 60% survived in Ireland after 30 years whereas the comparable figure for the same cohorts in the Republic was just under 50%.

Figure 8 shows survivorship rates for the cohorts born in the Republic since 1916. As discussed earlier, in the 20th century life expectancy was much higher than in the 19th century so that the major factor determining the survival rate in Ireland of successive cohorts was the emigration rate for that cohort.

The cohort born between 1916 and 1925 had a very different experience to the cohorts born in the 19th century. After 20 years 80% of them survived in Ireland. This reflected a much smaller rate of emigration in their early adult years. This was because they came to adulthood around the time of the Second World War when emigration rates were very low. However, after 30 years the survival rate had fallen to 60% suggesting that, while they could not emigrate during the war years, they did leave Ireland in the subsequent decade, probably at an older age than was normal for other cohorts. After 40 years the survival rate was identical to that for the 1926-35 cohort.

Both the 1926-35 and the 1936-45 cohorts experienced a major loss after 20 years. Both of these cohorts came to adulthood in the period from the late 1940s through to the early 1960s when the post-War emigration rate peaked.

For those born after 1946 the experience has been very different. The lowest survival rate after 20 years was 80% -for the 1946-55 cohort. For later cohorts there is clear evidence of significant return migration, with the survival rate after 40 years being close to unity. In the case of the most recent cohort, those born between 1976 and 1985, the numbers in Ireland after 20 years are actually higher than the number born in Ireland, due to the substantial immigration of the 2000s.

Thus after 120 years of continuous emigration, with up to half those born in Ireland emigrating when they reached adulthood, the last 30 years have seen a completely different demographic pattern.

While emigration continues to be part of the Irish experience, many of those who leave subsequently return and, in the last two decades, their numbers have been supplemented by significant immigration of people not born in Ireland.

7. CONCLUSIONS

The publication of the first volume of the Registrar General's Report for 1864 represented a major step forward for analysing Irish demography. The data contained in the subsequent 150 annual volumes provides the essential material to analyse the dramatic changes in demographic behaviour that Ireland has experienced since the Famine. The analysis of these data since they were first published has provided the material for many papers to this Society over the last century.

The distinguishing feature of Irish demography since the 1860s was the very high rate of emigration, leading to what was frequently referred to as the "Irish population problem": the falling population. However, that long established pattern has been turned on its head in the last few decades. Over the last 20 years, the ending of net emigration and the more recent advent of substantial net immigration has resulted in the Republic of Ireland experiencing one of the highest rates of population growth in the EU.

While the pattern of demographic change in the Republic and in Northern Ireland to some extent diverged over the 20th century, in recent decades there has been a convergence in both life expectancy and fertility. In both cases Ireland, North and South, now shows a rather similar pattern of behaviour to that in Great Britain today. Even the development of a pattern of substantial immigration into Ireland since the mid-1990s mirrors the British experience.

When Geary in 1936 presented a paper to this Society developing a range of estimates for the population of Ireland sixty years later he was surprisingly percipient. However, when you look at the detail of the numbers it is apparent that the factors driving population change turned out very different from what he had expected: it was just that the differences in the outturn from what Geary had assumed cancelled each other out. This highlights the importance of the "unexpected" in driving demographic change over a very long time horizon.

References

- Barrett, A., McGuinness, S. and O'Brien, M. (2012), The Immigrant Earnings Disadvantage across the Earnings and Skills Distributions: The Case of Immigrants from the EU's New Member States. *British Journal of Industrial Relations*, 50: 457–481.
- Bergin, A., T. Conefrey, D. Duffy, J. FitzGerald, I. Kearney, K. Timoney and N. Žnuderl, 2013, *Medium- Term Review: 2013-2020*, Dublin: The Economic and Social Research Institute.
- Bradley, J., J. FitzGerald, D. Hurley, L. O'Sullivan and A. Storey, 1993. "HERMES: A Macrosectoral Model for the Irish Economy", in Commission of the European Communities (ed.), HERMES: Harmonised Econometric Research for Modelling Economic Systems, North Holland.
- Brennan, Joseph et al., 1938, 'The population problem : a radio discussion'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XVI No. 1, 1937/1938, pp112-121.
- Commission of Emigration and Other Population Problems*, 1955, Dublin: The Stationery Office.
- Courtney, D., 1995, "Demographic Structure and Change in the Republic of Ireland and Northern Ireland", Patrick Clancy, S. Drudy, K. Lynch and L. O'Dowd (ed), *Irish Society: Sociological Perspectives*, Dublin: Institute of Public Administration.
- Courtney, D., 2000, "A Quantification of Irish Migration with Particular Emphasis on the 1980s and 1990s", A. Bielenberg (ed), *The Irish Diaspora*, Essex, Pearson Education Limited.
- Daly, M., 1997, *The spirit of earnest inquiry : the Statistical and Social Inquiry Society of Ireland 1847- 1997*, Institute of Public Administration, Dublin.
- Fahey, T., and J. FitzGerald, 1997, *Welfare Implications of Demographic Trends*, Dublin: Oak Tree Press.
- Fahey, Tony, FitzGerald, John D. and Maitre, Bertrand., 1998, 'The economic and social implications of demographic change'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXVII, Part V, 1997/1998, pp185-222.

- FitzGerald, J., forthcoming, "Irish Demography Since 1740", in Daly M. and E. Biagini, *A social history of Ireland*.
- Garvey, D., and M. McGuire, 1989, "The Structure of Gross Migration Flows (Labour Force Survey Estimates)", The Economic and Social Research Institute Seminar, Dublin.
- Geary, R. C., 1936, 'The future population of Saorstát Eireann and some observations on population statistics'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XV No. 6, 1935/1936, pp15-35
- Grimshaw, Thomas Wrigley. 1883, 'On some comparative statistics of Irish counties, compiled from the returns obtained during the late census and the census of 1841, and other publications issued by the General Register Office of Ireland'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. VIII, Part LXI, 1882/1883, pp444-458
- Hall, M., 2012, "Mortality in Ireland 1901 to 2006", *British Actuarial Journal*, Vol. 18, part 2, pp. 436– 451.
- Hatton, T. and J. Williamson, 1993, "After the Famine: Emigration from Ireland, 1850-1913", *The Journal of Economic History*, Vol. 53, No. 3, pp. 575-600
- Honohan, P., 1992. "The Link Between Irish and UK Unemployment", Quarterly Economic Commentary, Spring, pp. 33-44, Dublin: The Economic and Social Research Institute.
- Honohan, W. A., 1944, 'Irish actuarial data'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XVII, Part 3, 1945/1946, pp381-403
- Keating, W. 1977, 'An analysis of recent demographic trends with population projections for the years 1981 and 1986'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXIII, Part IV, 1976/1977, pp113-150.
- Layte, R., O'Hara, S. & Bennett, K. (2010). Explaining structural change in cardiovascular mortality in Ireland 1995–2005: a time series analysis. *The European Journal of Public Health*.
- Lee, J., 1981, "On the Accuracy of Pre-Famine Censuses" in Goldsrom M., and Clarkson L. eds., *Irish Population, Economy and Society: Essays in Memory of K.H. Connell*, Oxford: Oxford University Press.
- Linehan, T. P. 1991, 'History and development of Irish population censuses'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXVI, Pt. 4, 1991/1992, pp91-132
- McGovern, M., 2016, "Progress and the Lack of Progress in Addressing Infant Health and Infant Health Inequalities in Ireland during the 20th Century", Paper Delivered to the Statistical and Social Inquiry Society of Ireland.
- McWeeney, E.J., 1907, 'Popular endeavour against tuberculosis? its instruments, methods, and results'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XII Part LXXXVII, 1906/1907, pp62-92
- Ó'Gráda, C., 1994, *Ireland, A New Economic History: 1780-1939*, Oxford: Oxford University Press.
- Punch, A. and Finneran, C., 1999, 'The demographic and socio-economic characteristics of migrants, 1986-1996'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXVIII, Pt. I, 1998/1999, pp213-263
- Punch, Aidan, 2007. 'Marriage, fertility and the family in Ireland? A statistical perspective'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXXVI, 2006/2007, pp193-227. Registrar General, *Annual Report, 2014*, <http://www.nisra.gov.uk/demography/default.asp22.htm>
- Thompson, William J., 1911, 'The development of the Irish census, and its national importance'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XII Part XCI, 1910/1911, pp474-488
- Thompson, William J. 1913, 'The Census of Ireland, 1911 (illustrated by lantern slides)'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XIII Part XCIII, 1912/1913, pp46-59
- Thompson, William J., 1918, 'Fifty years vital statistics in Ireland'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XIII Part XCVII, 1917-1919, pp572-605

Thompson, William J., 1920, 'Mortality from influenza in Ireland'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XIV No. 1, 1919/1920, pp1-14.

Thompson, William J., 1926, 'The first census of the Irish Free State and its importance to the country'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XIV No. 4, 1925- 1927, pp239-248.

Walsh, B.M., 1968. Some Irish Population Problems Reconsidered, General Research Series Paper No. 42, Dublin: The Economic and Social Research Institute.

Walsh, B.M., 1974, "Expectations, information, and human migration: specifying an econometric model of Irish migration to Britain", *Journal of Regional Science* Vol. 14 no. 1, 1974

Walsh, B.M., 1970, "Marriage Rates and Population Pressure: Ireland, 1871-1911.", *Economic History Review*. Apr70, Vol. 23 Issue 1.

Walsh, Brendan M., 2008, 'Recent trends in mortality and morbidity in Ireland: annual symposium - Wealthier and healthier: Ireland's demographic catch-up'. - Dublin: *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol.37, 2007/8 , pp.95-112

White, Ian, 2011, "A Brief History of the Census in Ireland/Northern Ireland", in Registrar General Northern Ireland, *Annual Report, 2011*, Belfast: The Northern Ireland Statistics and Research Agency.

Williamson, J.G., 1994, "Economic Convergence: Placing Post-Famine Ireland in Comparative Perspective", *Irish Economic and Social History*, Vol. 21 pp.5-27

APPENDIX 1: COMPLETED FAMILY SIZE

Table A1 gives the average number of children born to married women aged 45-49 in the relevant Census year. This extends Table 2 in Punch, 2007, by including estimates for 1911 and 1946. For 1991 and 2011 the data are taken from the 2011 Census, with the figures for women aged 65-69 in 2011 providing an estimate for women aged 45-49 in 1991. Data for the average number of children for all women are included for comparative purposes for 1991 and 2011.

Table A1: Completed Family Size for Women aged 45 to 49

Birth Cohort	Census Year	Average completed family size	
		Married women	All Women
1862-66	1911	6.5	
1897-01	1946	4.2	
1922-26	1971	4.3	
1932-36	1981	4.2	
1942-46	1991	3.5	3.2
1962-66	2011	2.5	2.2

APPENDIX 2: MODELLING LIFE EXPECTANCY IN THE 19TH CENTURY

There are three elements which determine the change in the population from one year to the next: births and deaths, which between them determine the natural increase, and migration. From 1864 onwards there are annual figures for the number of births and deaths recorded in each year, which appear to be reasonably reliable. However, as discussed in the paper, the published annual figures for emigration in the 19th century suffer from a number of defects. Hence reliance is placed on residually deriving net migration figures using the Census.

Life tables were published by the CSO for 1926 and the CSO also provide life expectancy at a number of ages for men and women back to 1871. In this appendix the 1926 life tables are adjusted so that they reproduce the life expectancy figures for men and women for 1871. For 1871 the CSO publish for men and women life expectancy at birth, at age 15, 25, 35, 45, 55, 65 and 75.

The adjustment of the life tables is done firstly by using the infant mortality data to adjust the probability of surviving from birth to age 1. For the rest of the 1926 table the probability of surviving from age t to age $t+1$ is multiplied by a constant so that the table reproduces the published life expectancy at the different ages. Separate constants are used for each age range – e.g. between 1 and 15, between 15 and 25 etc. Because of “heaping” in the Census data, the data from the different censuses are grouped in 10 year cohorts. The probability of that cohort surviving 10 years is then derived using the modified life tables. This gives an estimate of the number of deaths over the 10 year period.

This approach is tested for the periods 1871-1881 and 1881-1891 for which we have comprehensive figures on number of deaths. The results indicate a reasonable level of accuracy for this method of estimating numbers of deaths. For the period 1861-1871 we have births and deaths data from 1864. Births and deaths for 1861- 1863 are assumed to be the same as the average for the period 1864-71. The life tables are applied to the 1861 census data to derive the number of deaths between 1861 and 1871. This estimated number of deaths is similar to the number derived from the annual figures from 1864-1871. This suggests that life expectancy in 1861 was similar to that in 1871.

Finally, the life tables are applied to the 1851 census on the assumption that the life expectancy in 1851 was the same as in 1861 (and in 1871). This provides an estimate of the number of deaths. The number of births is derived assuming marital fertility was similar to that between 1861 and 1871.

Taken together these estimates mean that an estimate of net emigration between 1851 and 1861 can be derived using the Census data. The resulting estimate of emigration is very similar to the published figure for emigration of Irish people from the then United Kingdom. This would be consistent with unchanging life expectancy between 1851 and 1861.

Table A2 shows the estimates of births, and deaths and emigration derived in the way described above. These numbers are contrasted with the figure for deaths from the Registrar’s reports.

Table A2: Estimates of births, deaths, and emigration in Ireland

	1851-60	1861-70	1871-80	1881-90	1891-00
Population - opening	6552385	5798967	5412377	5174836	4577688
Population - closing	5798967	5412377	5174836	4577688	4398211
Official stats:					
Births	1547000	1447883	1402277	1150445	1055020
Deaths		912954	966745	883156	836035
Estimated:					
Deaths	944632	919158	962371	898684	835793
Official stats:					
Gross Emigration	1226487	771900	620585	770706	433526
Census based estimate:					
Implied net emigration	1360418	921519	673073	864437	398462
Estimated using life tables to estimate deaths:					
Emigration	1360630	911637	685921	837082	389635

DISCUSSION

James O'Mahony: What bearing did the welfare system have on the trends observed? I met a retired British doctor in Trinity who had not been in Dublin for fifty years. He had come to Dublin as it and Glasgow were the two main sites for obstetrics training in the British Isles at the time. This was because these were the two cities with the highest rates of obstetric complications. This reflects the high maternal and infant mortality figures given in the presentation.

Brendan Ryan: I have just two questions. First I was wondering if in the course of your research into the early and mid 19th century census records you came across papers questioning the reliability of these censuses and in particular the 1841 census. We have always been told that the population of Ireland reached a peak in 1841 and was then reduced severely by famine and emigration. But how reliable were the 1841 census figures themselves? Were they exaggerated? There appears to be some evidence that the 1821 and 1831 censuses may have been exaggerated by the fact that census enumerators appear to have been paid according to the number of people recorded - leading to an obvious upward bias. My second question is about the slide showing completed family size for married women and all women. I may be misreading this table, but I was surprised by the implied figures for non-marital births for women born in the early 1940s. Perhaps you could explain this further.

David Jacobson: I would like to join others in thanking Prof. Fitzgerald for an extremely interesting paper. My first comment is in relation to the fact that, like demographic data, agricultural data, too, are relatively reliable and of relatively long time series in Ireland. This makes possible a comparison between number of people and number of head of livestock, over the period of declining population from the Famine to the 1960s. And what a plotting of these two data sets describes is a neat 'X'. It might be of interest to consider any causal economic or social relationship between population and number of head of livestock.

A second comment addresses a number of the issues raised in the paper. Various aspects of the life of families, including age at marriage and survival rates of children, may be affected by the nature of households, for example the evolution of households from extended families to nuclear families. How and when this evolution took place in Ireland may contribute to an explanation of some of the differences between Irish trends and those in other European countries.

Patrick Honohan: A most stimulating presidential address and one could comment in any number of directions. Let me just choose just one dimension: urban-rural differentials. Professor FitzGerald highlights the interesting fact that life expectancy was a lot higher in Ireland in the late 19th Century. He mentions that contemporary observers attributed at least part of this to the relatively higher rural population. I wonder could the fact that the remaining population in those years were the survivors of the Great Famine (and their offspring) also be a contributory factor? More generally, we know from Mary Daly's *The Slow Failure* emphasizes how much credit was given in Ireland to the merits of rural life. Perhaps this bias contributed to a relative neglect of health service and other improvements that could be best delivered for urban areas. That would help explain how Ireland's performance in these respects fell behind in the first half century of independence.