Patterns of mortality in second generation Irish living in England and Wales: longitudinal study

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See editorial
by Haskey

Abstract

Objective—To examine the mortality of second generation Irish living in England and Wales.

Design—Longitudinal study of 1% of the population of England and Wales (longitudinal study by the Office of Population Censuses and Surveys (now the Office for National Statistics)) followed up from 1971 to 1989.

Subjects—3075 men and 3233 women aged 15 and over in 1971.

Main outcome measures—Age and sex specific standardised mortality ratios for all causes, cancers, coronary heart disease, cerebrovascular diseases, respiratory diseases, and injuries and poisonings. Deaths were also analysed by socioeconomic indicators.

Results—786 deaths were traced to men and 762 to women. At working ages (men, aged 15–64; women, 15–59) the mortality of men (standardised mortality ratio 126) and women (129) was significantly higher than that of all men and all women. At ages 15–44, relative disadvantages were even greater both for men (145) and for women (164). Mortality was raised for most major causes of death. Significant excess mortality from cancers was seen for men of working age (132) and for women aged 60 and over (122). At working ages mortality of the second generation Irish in every social class and in the categories of car access and housing tenure was higher than that of all men and all women in the corresponding categories. Adjusting for these socioeconomic indicators did not explain the excess mortality.

Conclusion—Mortality of second generation Irish men and women was higher than that of all men and all women and for most major causes of death. While socioeconomic factors remain important, cultural and lifestyle factors are likely to contribute to this adverse mortality.

Introduction

The Irish born population in England and Wales, estimated at 2% of the population (just over 750 000), is the largest migrant group.¹ The health needs of these people, however, remain relatively underresearched. The last national analysis by country of birth showed that the mortality of Irish people was higher than that of all other migrant groups.² Young adults, particularly men, showed even higher mortality. For all major causes of death, Irish born people showed adverse mortality risks compared with the host population.

Migrant studies, such as those of Japanese people in the United States and of Polish people in England and Wales, have shown that patterns of mortality converge over time with those of the host population.^{3–5} As people become exposed to similar environmental influences, risk of disease shifts towards that of the host country. Migration of the Irish to England and Wales has been long standing, with two main peaks, around 1861 and 1961,⁶ so we expect the second generation Irish to be a sizeable ethnic group. In this context, the patterns of mortality of the second generation Irish should be similar to those of the population in England and Wales.

Using the longitudinal study by the Office of Population Censuses and Surveys (now the Office for National Statistics), we examined the mortality of the Irish who were born in England and Wales.

Methods

The longitudinal study is a record linkage study containing a 1% sample of the population of England and Wales born on one of four selected birth dates. The initial sample was drawn from the 1971 census and traced at the NHS Central Register. The study sample is continually updated by linking information from the record systems that routinely record date of birth. These include births, deaths, migrations, and information from subsequent censuses. Details of the study are discussed elsewhere.⁶

Country of birth was recorded in the 1971 census, the only decennial census to include country of birth of parents. This provided a unique opportunity to identify people born in England and Wales (aged 15 years and over at the 1971 Census) to parents born in the Republic of Ireland. Parents born in Northern Ireland could not be identified as they were coded as born in the United Kingdom. Overall findings are presented by father, mother, or both parents born in Ireland. Because of the limitation of sample size on disaggregation, however, most of the detailed results presented are for those with at least one parent born in the Republic of Ireland.

We analysed deaths during the follow up period 1971 to 1989. On the basis of person years at risk, we derived sex specific standardised mortality ratios for all causes, all cancers, lung cancer, ischaemic heart disease, cerebrovascular diseases, respiratory diseases, and injuries and poisonings, adjusted for age and calendar period.⁷ The standard rates were age, sex, and cause specific rates of the whole longitudinal study's sample. Findings presented at working ages refer to age adjusted mortality of men aged 15–64 and women aged 15–59.

We examined the influences of varying socioeconomic distributions by repeating the analysis and standardising for social class (according to occupation), for access to a car, and for housing tenure at the 1971

Table 1—Age adjusted standardised mortality ratios (95% confidence interval),* 1971–89, of second generation Irish living in England and Wales

Age at death (years)	No of deaths	Standardised mortality ratio
Men:		
15–44	46	145 (106 to 194)†
45–64	194	122 (106 to 141)†
65–74	270	119 (105 to 134)†
≥ 75	276	95 (84 to 107)
≥ 15	786	111 (103 to 119)†
Women:		
15–44	32	164 (112 to 232)†
45–59	62	116 (89 to 148)
60–74	209	112 (97 to 128)
≥ 75	459	112 (102 to 123)†
≥ 15	762	114 (106 to 122)†

*Relative to all men (standardised mortality ratio=100), all women (100).

†Standardised mortality ratio significantly different from 100.

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Table 2—Age adjusted standardised mortality ratios (95% confidence interval),* 1971-89, of second generation Irish aged 15 and over living in England and Wales, by mother, father, or both parents born in Ireland

	Men		Women	
	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio
Irish born mother	287	111 (99 to 125)	231	104 (91 to 119)
Irish born father	348	105 (94 to 117)	377	117 (105 to 129)†
Irish born mother and father	151	128 (109 to 150)†	154	123 (105 to 144)†
Either or both parents born in Ireland	786	111 (103 to 119)†	762	114 (106 to 122)†
χ^2 (1 df)‡		3.57		1.12
P value		0.06		0.29

*Relative to all men (standardised mortality ratio=100), all women (100).

†Standardised mortality ratio significantly different from 100.

‡One parent compared with both parents born in Ireland.

census. Women are classified by their own social class if they stated an occupation, otherwise by their partner's social class.

In the longitudinal study survivors who cannot be found through a registered event or at a subsequent census are assumed to be lost to follow up. Losses among the second generation Irish (8% of men and 7% of women) were slightly higher than for all men (6%) and all women (5%) by the end of the study period. No evidence was found of a systematic bias in terms of socioeconomic characteristics of those missing, which suggests that the impact on the mortality estimates is negligible.

Results

We identified 6308 second generation Irish (3075 men, 3233 women) who were aged 15 and over at the 1971 census and traced at the National Health Service Central Register. This sample showed higher proportions of people aged 15-44 (63% men, 57% women)

than in the host population (53% men, 47% women) in 1971. The younger age distribution of the second generation Irish reflects the function of time of migration of their parents. During the period of follow up 1971-89, 1548 deaths (786 to men, 762 to women) occurred among the second generation Irish.

AGE ADJUSTED MORTALITY

Table 1 shows significantly higher mortality of second generation Irish men and women. Mortality excesses were greater at younger working ages (15-44) than at older ages, with greater excesses among women than among men. At the oldest ages (75 and over), women continued to show significantly higher mortality than that of all women.

Mortality varied depending on whether one or both parents were born in Ireland. Table 2 shows that the summary measure, based on those with at least one parent born in Ireland, may underestimate the mortality disadvantage of those with both parents born in Ireland. The difference between the standardised mortality ratios, however, did not reach formal significance.

CAUSE SPECIFIC MORTALITY

Table 3 shows a pattern of higher mortality from most major causes except cerebrovascular diseases for men and injuries and poisonings for women. Significantly higher mortality from all cancers and lung cancer is seen for men at working ages (15-64) and for women aged 60 and over. At these older ages women also showed a significant excess of deaths from respiratory diseases. Higher mortality from "other cancers" was also evident among women and peaked at ages 35-44 (standardised mortality ratio 217 (95% confidence interval 104 to 398)).

SOCIOECONOMIC DIFFERENCES IN MORTALITY

Table 4 shows higher mortality of second generation Irish men in every social class compared with all men in

Table 3—Cause specific standardised mortality ratios (95% confidence interval),* 1971-89, of second generation Irish living in England and Wales

	Age at death (years)					
	15-64†		≥ 65‡		≥ 15	
	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio
Men						
All cancers:	72	132 (103 to 166)§	123	105 (88 to 126)	195	114 (99 to 131)
Lung cancer	32	152 (104 to 214)§	44	103 (75 to 138)	76	119 (94 to 149)
Other cancers	40	120 (86 to 163)	79	107 (85 to 134)	119	111 (92 to 133)
Ischaemic heart disease	74	114 (89 to 143)	171	110 (94 to 127)	245	111 (97 to 126)
Cerebrovascular diseases	8	70 (30 to 137)	57	96 (72 to 124)	65	91 (71 to 116)
Respiratory diseases	16	122 (70 to 199)	94	114 (92 to 139)	110	115 (95 to 139)
Injuries and poisonings:	26	140 (92 to 206)	7	94 (38 to 193)	33	127 (87 to 178)
Suicides¶	10	145 (70 to 266)	0	0	10	115 (55 to 211)
Injuries	16	138 (79 to 224)	7	123 (50 to 254)	23	133 (84 to 200)
All causes	240	126 (111 to 143)§	546	105 (97 to 115)	786	111 (103 to 119)§
Women						
All cancers:	45	133 (97 to 178)	136	122 (102 to 144)§	181	124 (107 to 144)§
Lung cancer	6	136 (50 to 297)	25	157 (102 to 232)§	31	153 (104 to 217)§
Other cancers	39	132 (94 to 181)	111	116 (95 to 139)	150	120 (101 to 140)§
Ischaemic heart disease	9	102 (47 to 193)	161	109 (92 to 127)	170	108 (93 to 126)
Cerebrovascular diseases	4	78 (21 to 201)	106	106 (87 to 128)	110	105 (86 to 126)
Respiratory diseases	4	94 (26 to 241)	100	134 (109 to 163)§	104	132 (108 to 160)§
Injuries and poisonings:	10	148 (71 to 273)	8	67 (29 to 131)	18	96 (57 to 151)
Suicides¶	4	125 (34 to 321)	0	0	4	76 (21 to 195)
Injuries	6	169 (62 to 368)	8	80 (34 to 157)	14	103 (56 to 173)
All causes	94	129 (104 to 157)§	668	112 (104 to 121)§	762	114 (106 to 122)§

*Relative to all men (standardised mortality ratio=100), all women (100).

†Age 15-59 for women.

‡Age 60 and over for women.

§Standardised mortality ratio significantly different from 100.

¶Includes undetermined deaths.

Table 4—All cause standardised mortality ratios (95% confidence interval)* for all men and all women and second generation Irish men and women at working ages,† by social class, car access, and housing tenure at the 1971 census, and mortality standardised for these measures

	All men		Second generation Irish men		All women		Second generation Irish women	
	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio	No of deaths	Standardised mortality ratio
Social class‡								
I and II	1874	76 (73 to 80)§	30	90 (61 to 129)	650	76 (70 to 82)§	9	74 (34 to 141)
III Non-manual	1018	97 (91 to 104)	27	168 (111 to 244)§¶	451	90 (82 to 99)§	7	73 (29 to 150)
III Manual	3681	99 (96 to 102)	57	126 (96 to 164)	1162	101 (95 to 107)	23	166 (105 to 248)§¶
IV and V	2721	117 (113 to 122)§	48	143 (105 to 189)§	813	113 (105 to 121)§	18	182 (108 to 287)§
Mortality standardised for social class		100		132 (112 to 154)§		100		130 (99 to 170)
Housing tenure								
Access to car:								
Owner occupier	4438	77 (75 to 80)§	57	84 (64 to 109)	1620	77 (73 to 81)§	26	94 (62 to 138)
Tenant, local authority	2265	104 (100 to 108)	41	138 (99 to 187)	767	100 (93 to 107)	13	138 (73 to 235)
Tenant, private sector	1150	90 (85 to 96)§	14	102 (56 to 171)	403	94 (85 to 104)	9	152 (69 to 288)
No access to car:								
Owner occupier	1657	108 (103 to 115)§	26	131 (86 to 193)	607	105 (97 to 114)	11	125 (62 to 224)
Tenant, local authority	2761	131 (126 to 136)§	66	156 (121 to 199)§	1108	136 (128 to 145)§	26	194 (127 to 285)§
Tenant, private sector	1328	135 (128 to 142)§	31	193 (131 to 273)§	449	125 (114 to 137)§	7	95 (38 to 196)
Mortality standardised for housing tenure and car access		100		124 (109 to 141)§		100		126 (102 to 155)§

*Relative to all men (standardised mortality ratio=100), all women (100).

†Men aged 15-64, women aged 15-59 at death.

‡First five years of follow up were excluded to allow for health selection.⁸

§Standardised mortality ratio significantly different from 100.

¶Significant difference between standardised mortality ratios of second generation Irish men and women and that of all men and women in same category, $P < 0.05$.

the corresponding social class. Although the pattern of class mortality among second generation Irish men is not as consistent as for all men, a split between non-manual workers and manual workers shows a class gradient. On disaggregation of social classes IV and V, men in social class V (standardised mortality ratio 215 (138 to 320)) show the highest mortality. Second generation Irish women generally show a similar pattern to all women, but class differences are greater because of particularly high mortality in the manual social classes.

Mortality of the second generation Irish is also higher in most categories of tenure and car access compared with all men and all women in the same category. The pattern of mortality differences is generally similar to the host population, with lower mortality in every housing category in which occupants have access to a car than in those in which occupants have no access to a car. The only exception is women in privately rented housing without access to a car as they show lower (non-significant) mortality than all women.

At older ages similar patterns were seen for social class, with higher mortality in every class category compared with the mortality of all men and women in the corresponding classes. The same is true for mortality of women at older ages by car access and tenure, but among men mortality was similar to that among all men.

The standardised mortality ratios adjusted both for social class and for tenure and car access at working ages (table 4) showed little or no improvement in the overall age adjusted mortality of second generation Irish men or women. Beyond working ages, age adjusted mortality ratios standardised for social class (men 110, women 109) and for car access and tenure (men 107, women 114) were similar to ratios adjusted for age only (men 105, women 112).

MORTALITY DIFFERENCES BY TIME PERIOD

No significant difference was found between the standardised mortality ratios for the 1970s and those for the 1980s (table 5). Aware that standardised mortality ratios are relative measures, we also examined the death rates. Over the two decades the death rates per person years at risk at working ages in men (1971-80, 2088; 1981-9, 2299; $\chi^2=2.04$, $P=0.15$) and in women (1074; 880; $\chi^2=3.39$, $P=0.07$) did not show any significant declines. At older ages a significant decline in mortality between the decades was noted for women only.

Discussion

Explanations for the high mortality of first generation Irish migrants have centred on health selection issues.^{9 10} Ease of migration to Great Britain might have encouraged the less healthy to migrate, helping to explain why their mortality was higher than that of the Irish in the Republic of Ireland. Health selection issues are less important in explaining the mortality of second generation migrants. One previous attempt based on a shorter follow up period suggested raised all cause mortality of the second generation Irish.¹¹ This study covers 19 years of follow up of the longitudinal study's cohort and examines in detail the cause specific mortality of the second generation Irish along with socioeconomic influences. The findings clearly show that the second generation Irish continue to experience adverse mortality risks, particularly at younger ages, and for all major causes of death. These patterns are very similar to those reported for the first generation Irish.^{2 9}

It has been suggested that Irish immigration is linked to high mortality in certain urban areas in Britain through entrenched economic and cultural differences in life

Table 5—Age adjusted standardised mortality ratios* for second generation Irish living in England and Wales, 1971-80, 1981-9

	Age at death (years)					
	Men			Women		
	15-64	65-74	≥ 75	15-59	60-74	≥ 75
1971-80	113	112	89	128	110	113
1981-9	144	130	100	130	114	111
1971-89	126	119	95	129	112	112
χ^2 (1df)	3.26	1.39	0.79	0	0.04	0.02
P value	0.07	0.24	0.37	0	0.83	0.89

*Relative to all men (standardised mortality ratio=100) and all women (100).

Key messages

- This study shows that second generation Irish men and women—particularly those with both parents born in Ireland—show higher mortality than all men and all women in England and Wales
- Mortality is raised for most major causes of death, with a significant excess from cancers
- Adjustment for social class, car access, and housing tenure did not explain the excess in all cause mortality
- With over two million second generation Irish and growing numbers of a third generation, their health needs special consideration

chances.¹² The high mortality of the second generation implies that these structural factors remain in place. Evidence exists, however, for structural assimilation as higher levels of upward occupational and educational mobility for second generation Irish compared with the English have been shown for both men and women.¹³ We also found higher proportions of second generation Irish (men 30%, women 39%) in a non-manual social class than all longitudinal study members (men 25%, women 26%). This difference was mainly due to the larger proportion of second generation Irish in social class III non-manual, which includes clerks, cashiers, and sales assistants. However, we found lower proportions (men 54%, women 54%) with access to a car compared with all members in the longitudinal study (men 63%, women 62%). Although these are established indicators of the social forces affecting health and disease,¹⁴ they fail to explain the high mortality of the second generation Irish. Current work examines whether these patterns obscure intraclass differences and also the impact of changes in social circumstances on mortality in the 1980s. Lifestyle factors such as diet, smoking, and drinking among the second generation Irish also need to be explored as first generation Irish have a higher prevalence of smoking and drinking than the population in England and Wales.^{15 16} This raises the question of whether there has been a generational lag in lifestyle despite some structural assimilation.

In addition, the process of migration entails economic and social upheaval, breakdown of family ties, and adjustment to a new environment.^{17 18} It could be argued that these factors continue to influence the total course of ill health of second generation migrants. Some argue that, unlike the positive identity of American-Irish in the United States, the identity of the Irish in England has not been supported by the Catholic church or other institutions.^{19 20} The unrest in Northern Ireland is likely to have added to the difficulties in promoting a positive Irish identity. The negative perception of Irishness might have created cultural pressures on the Irish to become English,²¹ though studies of second generation Irish children showed that a sizeable proportion resisted the process of assimilation and asserted an Irish identity.²²

CONCLUSION

This paper shows that the second generation Irish born in England and Wales, particularly those with both parents born in the Republic of Ireland, experience significantly higher mortality than that for England and Wales for most major causes of death. There are many factors that could contribute to this adverse experience. Though the immediate issues of migration are less important and there is a degree of structural convergence in terms of socioeconomic status, there is

no reason to believe that these factors do not still operate. Furthermore, cultural and lifestyle factors are likely to have a significant role. With over two million second generation Irish¹¹ and growing numbers of a third generation, clearly special consideration should be given to their health.

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Corrections

Randomised study of n of 1 trials versus standard practice

A potentially important error occurred in this paper by Jeffrey Mahon and colleagues (27 April, pp 1069-74). The authors cited the wrong reference at number 21 (concerned with the argument that the minimal clinically important difference for n of 1 trials shown by a seven point Likert scale is a mean change of 0.5 per symptom). The correct reference is:

- 21 Jaeschke R, Guyatt GH, Keller J, Singer J. Interpreting changes in quality-of-life score in n of 1 randomized trials. *Control Clin Trials* 1991;12:226-33S.

Ranitidine and aseptic meningitis

Owing to an editorial error the names of two authors were omitted from this drug point by J M Durand and L Suchet (6 April, p 886). The two other authors were Sophie Morange from the department of toxicology and Bernard Michel from the department of neurology at the Sainte-Marguerite Hospital in Marseilles, France.