Infant Sex Ratios in England and Scotland in the Nineteenth Century

1841	England	Scotland	Ireland
SR2	98.0	102.6	104.3
SR5	98.7	102.8	103.5

Evidence for later years also that England's SR1 was low ... pessimist positions are promoted here.

Infant Sex Ratios and the Standard of Living Debate

Infant sex ratios offer a new empirical perspective on the famous Standard of Living debate. The related literature is voluminous, and we will not attempt to synthesize it.[1] Instead, our point of departure is Griffin's (2018) erudite contribution which offers a nuanced discussion of the relevant economic history research and then broadens the theoretical and empirical grounds for debate. Griffin (2018:239) starts with an outsider's cogent summary statement of the current consensus among economic historians on the course of English living standards in the first half of the nineteenth-century: "real wages were largely stagnant. while according to all other measures life actually worsened." And then she carefully works to "problematize" that consensus.

According to Griffin:

"early industrial Britain was an economy of (at least) two halves: a dynamic urban/industrial sector set against a stagnant rural one. ... In towns and industrial districts, men enjoyed higher wages and steady employment. In addition to working longer hours themselves, they also enjoyed the more dubious pleasure of being able to send large numbers of their household, including young children, to work as well.

rural England not so much ...

CURRENT PLAN: Griffin seeks to challenge the binary of pessimist or optimist ... but sometimes the binary works. SR1 suggest the English people's health took a hit from industrialization -- in comparison to their rural neigbors... the ISSUE IS: did people **choose** to go industrial; and if so, what sort of info did they have?

After highlighting the need to consider gender when interpreting height data (the mother usually central to nutrition in a person's growth years), Griffin eschews aggregative approaches and draws on non-statistical evidence to

Detailed discussion: Griffin points out ambiguities in the "evidence of stagnant living standards" that underpins the consensus -- noting the possibility of real wage gains for men. Of particular interest here, Griffin directs attention to evidence on heights that has been a key indicator of worsening health conditions with industrialization (Komlos cites here, and others). Griffin points to the importance of "grasping the gendered nature of the information contained in the heights data," pointing to central role of "the mother's access to resources" for nutrition during an individual's growth years -- most notably, *in utero,* in infancy, and during childhood. That insight informs "an alternative reading" of evidence of growth in men's wage and declines in men's heights: "men did indeed enjoy higher wages, but this did little to improve the diets of women and children."

1 For an introduction to the debate, see Engerman (1994, 1997) and Griffin (2018).

But Griffin eschews “generalizing statements ... frou

Prefamine Ireland

Abstract. Research on prefamine Ireland offers an intriguing mix of evidence on living conditions, with economic indicators suggesting a pessimistic view of incomes and consumption (e.g. Mokyr 1983), but evidence on heights suggesting a more sanguine view (e.g. Mokyr and O' Gráda 1988, 1994, 1996; Nicholas & Steckel 1997). Infant sex ratios provide support for optimistic views of prefamine Ireland. The 1841 census data yield an infant sex-ratio of 104.5 for Ireland, consistent with views of the prefamine Irish as a robust and healthy preindustrial population.[2] A regional breakdown suggests that good health was independent of the level of economic development (or industrialization).

Prefamine Ireland

Historical research on Ireland on the eve of the Great Famine paints an intriguing picture of a population that was poor but healthy, based on a mix of conflicting evidence on general living conditions.[3] Pessimistic views start with a focus on mass poverty in prefamine Ireland.[4] Production and income estimates certainly suggest a very poor society, compared to England and northwest Europe more generally. Current estimates put Ireland's per capita GDP in the early 1840's at just 1/3 of England's and 1/2 of France's. So low a level is not seen for England after the sixteenth century (and is seen only three times in the period 1350 to 1600).[5] The GDP evidence is certainly suggestive of relatively limited consumption opportunities in Ireland.[6] And some demographic

2 Recall that the SR1 is a one-sided test for maternal and infant misery, and it is possible for female-biased infanticide or neglect to produce a healthy-looking SR1 in an unhealthy population. That possibility seems unlikely of prefamine Ireland, because the under-5 sex ratio was somewhat lower than the SR1 (103.4 vs 104.5). With mortal misogny, we expect to see sex ratios increasing with age (the opposite of the biological tendency). Kennedy (1973) argues for excess female mortality in nineteenth-century Ireland, which he links to the subordination of women and girls. But Kennedy's discussion does not suggest excess female infant mortality. See also Scheper-Hughes (1987:11; 2001:236) on Ireland until the mid-nineteenth century: "Deformed, mentally handicapped, or sickly were sometimes viewed as 'changelings' tather than as human infants, and ... such babies were abandoned, tortured, or burned by their parents" 2001:236). Such practices seem likely to reduce the SR1 (not to inflate it), because on biological grounds, we would expect more male than female infants to be seen as "changelings" (even if son-preference would incline some parents otherwise).

3 Although it may be tempting to view the Irish Famine as some simple Malthusian crisis, research starting with Mokyr (1983) has pushed aside notions of 'overpopulation,' demonstrating that prefamine Ireland was not hovering on the brink of starvation. Ó Gráda (1993:6) does offer the Malthusian claim that "increasing population undoubtedly produced greater mass poverty." But his next line is "Yet the link between impoverishment and subsistence crises is not so clear cut."

4 Among many possible, see e.g. Mokyr (1983:1): "most of the people who lived in Ireland in this period were poor, poorer than in comparable economies in Europe"; or Ó Gráda (1993:40), on the "miserable and worsening lot of the bottom third or half of the population."

5 These comparisons draw on the per capita GDP estimates for Ireland and England from Thomas and Dimsdale (2017), "A Millennium of UK Data", Bank of England OBRA dataset, and the estimates for France and England from the Maddison Project Database 2018. Based on Thomas and Dimsdale's spreadsheets, Irish per capita GDP in the early 1840s was about £ 900 (2013 prices); values of English per capita GDP below £ 900 occur only 3 times after the year 1350 in their series (in 1375, 1556, and 1597); for the period 1350-1600, English per capita GDP averaged over £ 1,120. Ireland appeared less poor in earlier estimates of relative incomes. See e.g. Ó Gráda (2007), and references there; Ó Gráda (2007:45) suggested prefamine Irish per capita GDP was about 1/2 that in Britain. Mokyr's (1983:11) estimates of personal income per capita circa 1840 has Ireland at some 37% to 44% of England.

6 Relatively less inequality could have offset Ireland's income disadvantage, in terms of consumption levels of the non-elite. More importantly, as Mokyr (1983:7-8) emphasized, a "gigantic" index number problem looms in comparisons of Irish to English incomes, if the Irish simply enjoyed more leisure and larger families (perhaps at the cost of material incomes). On our reading, for Mokyr, the index number problem bears on the magnitude of the Irish-English income gap, but not its direction. In contrast, our sex-ratio evidence (below) raises questions about the direction of the gap, or about the relevance of national income values for standards of living in the nineteenth century. Such questions are also featured in historical research on comparative heights of Irish and British populations (see below).

evidence also points to a pessimistic view of prefamine living conditions. Contemporary life-tables placed Irish life expectancy at just under 30 years compared to over 41 years for the English.[7] And more recently, Mokyr (1983:38) estimated Irish infant mortality in 1840 to be 22.4 percent, at least one and half seven percentage points above contemporary England's (Mitchell 1998:120).[8]

However, other demographic evidence suggests a less pessimistic view, with only a small advantage to England in terms of life expectancies and infant mortality.[9] And of more importance, there is evidence to support an optimistic view of prefamine Irish living conditions. First, a wide range of non-quantitative evidence suggests the Irish peasantry were "healthy vigourous, and robust" (Mokyr 1983:6-9).[10] Second, research on heights among Irish and British populations finds the Irish taller than the English, but shorter than the Scots, in the half-century before the Famine.[11] Although some have challenged the use of average heights as a measure of living standards (Bodenhorn, Guinnane, and Mroz (2017), the evidence on Irish heights is consistent with more optimistic appraisals of the health of the Irish on the eve of the famine.

Turning to infant sex ratios in prefamine Ireland, reveals evidence for the optimistic view of Irish living conditions circa 1841 (see Table IRE1841.1), and offers nothing for a pessimistic view. With a value of 104.5 from the 1841 census, Ireland's infant sex ratio is typical of healthy, well-nourished maternal and infant populations in the nineteenth century. And the modestly lower SR5 value of 103.4 provides some assurance that the infant sex-ratio was not unnaturally boosted by mortal discrimination against infant girls.[12]

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7 Ireland Census 1841: lxxx; England, Registrar-General 1841: xvii, xix.

8 See also Mokyr and O' Grada (1988:229): "Irish infant mortality rates were about 50 per cent higher than in Britain". Infant mortality for England and Wales at mid-century was about 150-160 per thousand (e.g. Mitchell 1998:120-21; Davenport, 2020:460).

9 Boyle and Ó Gráda (1986:561) offer a more sangine view of life expectancy in prefamine Ireland. Based on 1841 and 1821 census figures, they estimate life expectancies at birth of 38.4 for male males and 38.3 for females. Those fall just a little short of British values; for example, Wrigley (2015:64) estimates 40.6 years for British life expectancy at birth in 1836. Other sources offer lower infant mortality estimates than Mokyr's. Boyle and O' Grada (1986:561) have Irish infant mortality in 1841 at 173/1000 for males and 135/1000 for females. Mitchell reports Irish infant mortality starting in the mid-1860s, when it was 98/1000, substantially below Englands rate of 160/1000 (1998:121-22); but a pessimist could argue the prefamine situation was much worse.

10 Mokyr offers a somewhat pessimistic perspective on the observed heartiness of Irish adults, suggesting (1983:8) a culling effect of high infant mortality: "High birth rates and high infant mortality rates tend to produce a residual adult population which is hardier and more resistant to disease". However, the results of McLaughlin, Colvin, and Blum (2020) cast doubt on a culling effect from prefamine infant mortality. They do find evidence of culling from famine mortality in areas hardest hit by the Famine; there, famine mortality was so selective that famine survivors tended to be relatively tall. But where famine mortality was not extreme, such as around Dublin, they find evidence of "scarring", with survivors from the famine period relatively short.

11 Mokyr and O' Gráda 1988, 1994, 1996; Floud et al. 1990:200-6; Ó Gráda 1991; Nicholas and Oxley 1993; Nicholas and Steckel 1997; Oxley 2004.

12 Of course it is possible that female-biased infanticide or neglect produced a healthy-looking SR1 in an Irish population that was actually unhealthy, but the SR5 being lower than the SR1 suggests otherwise; with mortal misogny we expect to see sex ratios increasing with age (the opposite of the biological tendency). Kennedy (1973) argues for excess female mortality in nineteenth-century Ireland, which he links to the subordination of women and girls. But Kennedy's discussion does not suggest excess female infant mortality. See also Scheper-Hughes (1987:11; 2001:236), on Ireland until the mid-nineteenth century: "Deformed, mentally handicapped, or sickly were sometimes viewed as 'changelings' tather than as human infants, and ... such babies were abandoned, tortured, or burned by their parents" (2001:236). Such practices seem likely to reduce the SR1, because on biological grounds, we would expect more male than female infants to be seen as "changelings" (even if son-preference would incline some parents otherwise).

Table IRE1841.1: Irish Infant & Child Sex Ratios in 1841

	SR1	SR1-2	SR5
Ireland	104.5	104.0	103.4

source: Report of the Commissioners ... Census of Ireland 1841. SR1-2 refers to the sex ratio for one-year-olds. SR5 refers to the sex ratio for children under 5 years of age.

Turning to provincial breakdowns of the sex ratio evidence undermines another pessimistic perspective on Ireland in 1841, one which associates early economic "development" with health and well-being. As Oxley (2004:73) succintly explained, Ireland was characterized by a "development gradient ... by famine's eve, Ulster was the most developed, followed by Leinster and then Munster, while Connaught was the poorest." Oxley points out that mortality in the Famine was "exactly the inverse" of the development gradient, which she interprets as evidence of a causal link from prefamine poverty to Famine mortality. The regional breakdown of the infant sex ratio provides some support for the hypothesized relationship between living conditions and development, as the Province of Ulster had the most favorable infant sex-ratio value, at 105.6. However, all four provinces had quite favorable infant sex ratios -- values of about 104, which are not suggestive of widespread destitution or hardship. We can agree with Oxley that development served to bolster an area's "resistance to blight-induced food shortages"; but we suggest the mechanism was simply that a more diversified economy was less vulnerable to failures of the potato crop.

Table IRE1841.2 Infant Sex Ratios by Province in 1841

Province	Ulster	Leinster	Munster	Connaught
SR1	105.6	103.8	104.4	103.9
90% C.I.	104.2-107.1	102.2-105.4	103.1-105.8	102.2-105.7

source: Report of the Commissioners ... Census of Ireland 1841.

Postscript -- Sex Ratios in 19th-century Ireland, Postfamine. Infant sex ratios from the decennial censuses (1851 to 1901) are mostly suggestive of good living conditions, with SR2 values usually around 104. The year 1871 offers one small exception to the general pattern, with a value of 102.5 for the SR2 -- about one and one-half percentage points lower than in the other censuses. That somewhat lower value of the SR2 for 1871 could be indicative of some challenges to maternal or infant health; more research is needed here.

The Under-2 Sex Ratio in Ireland, Postfamine Census Benchmakrs

year	1851	1861	1871	1881	1891	1901
SR2	104.4	103.7	102.5	104.4	104.5	104.0

sources: Census of Ireland, published volumes from Histpop.

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