

## Demography and industrialisation: a geographical overview

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*Gerry Kearns*

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### *The historical geography of British urban-industrialisation*

Figure 1 presents a checklist of some of the many topics comprised by the subject of the present volume; the relations between demography and industrialisation. The demographic variables of fertility, mortality and migration were inter-related in quite distinct ways during the various phases of industrialisation. I present a simplified account of some of these basic contrasts by distinguishing between early, middle and late phases of industrialisation. The early period was characterised by the transition from water- to steam-power. The middle period was the heyday of British steam-powered industrialisation. The late period saw British hegemony come under threat from Germany and the United States with new industries such as chemicals indicating a new technological frontier. I think that a geographical approach to these economic changes helps us to describe the ways these phases echoed through the population history of the industrialising countries. I would prioritise migration as the core of the demographic system at this time. The changes in industrial technologies entailed geographical shifts in the location of production which in turn reshaped regions, towns, cities and villages. It was against this unstable geographical and dynamic economic background that people made decisions about

Gerry Kearns

marriage and childbearing. It was in these new industrial and urban spaces that the negative externalities of the industrial revolution cut short the lives of their children, friends, colleagues and families.

In the early industrial period, much manufacturing was still located in the British countryside. In 1800 about one half of the rural population of England and Wales was employed outside agriculture.<sup>1</sup> Rural manufacturing produced a thickening of population density in certain regions, notably in the north and west, requiring contributions both from fertility and, more significantly, migration. Rural manufacturing together with the social security offered by the poor law<sup>2</sup> meant that England was relatively under-urbanised given the prominence of manufacturing in the economy. At the dawn of the industrial revolution, urban society was more commercial than industrial. This commercial focus explains, in large part, why the urbanisation, particularly of the early eighteenth century, was so dramatically concentrated on London. The development of factories changed this. At first, factories were located in places where water-power was both available and cheap. In avoiding competing demands for water, factories were drawn to the remoter parts of the hilly north-west but as steam replaced stream, industrial entrepreneurs could return to town where they found workers and an urban infrastructure they did not need to provide for themselves. The early industrial period, then, saw factory towns draw alongside London as the locus of urban growth.

DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

Figure 1. *Demography and industrialisation; a typology based on the British experience.*

	<b>Early (c.1780-c.1830)</b>	<b>Middle (c.1830-c.1880)</b>	<b>Late (c.1880-c.1920)</b>
<i>Urban growth</i>	London, factory towns	Industrial and commercial cities	London, suburbs
<i>Migration</i>	Circular	Circular	Circular
	Seasonal	Seasonal	Seasonal
	Intrarural	Intrarural	Intrarural
	Regional (to north and west)	Regional (to north and west)	Regional (to south and east)
	Rural-urban <i>Urban</i> niche model (pull) <i>Rural</i> hardship (push) rural manufacturing decline	Rural-urban <i>Urban</i> niche growth <i>Rural</i> manufacturing decline/ rural agricultural decline	Rural-urban <i>Urban</i> niche growth <i>Rural</i> agricultural decline
<i>Case studies</i>	Industrial town, factory children	Industrial city-region, Irish migration	Suburbs, middle-class
<i>Fertility</i>	Real wages	Work for women, child labour	Class-specific decline
<i>Mortality</i>	Rural (density) Urban (contact model)	New v. old cities Large v. small cities	Light v heavy industry Urban v. suburban
<i>Public health</i>	Contagion, quarantine	Miasma, environmentalism	Individualism; curative/behavioural
<i>Urban characteristics</i>	Nodes	Ecologies	Service hierarchies



Gerry Kearns

The middle industrial period, as defined here, witnessed the coalescence of factory villages into industrial cities and the concomitant extension of the ports and marts which managed provisioning and marketing for the new industrial regions. There were still new towns being created but increasingly urban-industrialisation settled into classic manufacturing regions of the midlands and the north-west. These regions were scored by the canals which brought in the coal and shaded by the smoke it produced. This was Dickens' Coketown as he satirised it in *Hard Times*, a landscape of fire and soot, a town of fact and fatigue:

The fairy palaces burst into illumination, before pale morning showed the monstrous serpents of smoke trailing themselves over Coketown. A clattering of clogs upon the pavement; a rapid ringing of bells; and all the melancholy-mad elephants, polished and oiled for the day's monotony, were at their heavy exercise again.<sup>3</sup>

By the late nineteenth century, the locus of most rapid industrialisation had shifted again and, from being a region of agricultural decline, the towns around London had become host to a range of cleaner industries which would define suburban industrialisation for much of the next century. The commercial function of London again asserted its authority over the economy and its global standing shaded the likes of Liverpool and Manchester.

These geographical shifts were sustained by changes in the nature and direction of migration. The circular migration of individuals engaged in peripatetic work persisted throughout the industrialising period as did the seasonal movement of workers in pursuit of the harvest and movement from areas where agricultural opportunities were in decline to areas where agriculture was booming. These sorts of migration, while affected by the geography of industrialisation, were not central to the urban growth characteristic of industrial Britain.

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

In European terms, early modern England was already heavily urbanised before the industrial revolution. It was second only to the Low Countries in the share of the population living in towns. If we include Ireland and Scotland, as we should, then, the contrast is somewhat less marked. Urban growth before 1800 relied upon in-migration due to the heavy mortality penalty associated with life even in the most modest market town.<sup>4</sup> Rural-urban migration at this time is perhaps best explained by the pull of urban opportunity. Those opportunities were growing but only slowly and the fluctuations in migration from year to year had, perhaps, more to do with the chronology of urban mortality than of the urban economy. In other words, the niches of urban employment opportunity were usually emptied through the death of the current incumbent. Outside a few booming cities, and most significantly London, rural migrants most often filled the shoes of dead urbanites. This migration system was quickly responsive to the expanded prospects offered by urban epidemics and town populations recovered quickly after plague or pox, at least in those cases, common after the fourteenth century, when rural areas were left untouched by the major urban epidemics.

As urban factory industries grew, some rural handicrafts suffered. This created a new rural push alongside the urban pull. The push from the countryside was augmented by changes in agriculture during the nineteenth century which raised the labour productivity of the growing of food. At the same time, the shift from arable to pasture in some regions of Britain shed further workers from agriculture. In the new urban-industrial regions the expansion of job opportunities proceeded apace. The number of urban job niches was no longer dependent upon urban mortality. The rhythms of economic growth now called the tune for rural-urban migration. In the late nineteenth century, the magnet of the coalfields weakened significantly and the movement of population back towards the south and east of the country began to fill up urban areas around London.

Gerry Kearns

We may summarise the history of British migration by evoking some of the pioneers of the new urban-industrial spaces. For the early industrial period, we might think of the factory children. Surrendered to poor law authorities, by rural parents unable to feed them as they saw the wages for workers such as handloom weavers evaporate in the heat of factory competition, these children were press-ganged into service in cotton factories. Their journey from rural handicrafts to urban factories was only more shocking than that made by many of their parents, sooner or later. The mass migration to the industrial city-regions of the middle period of industrialisation is exemplified by the gangs of Irish people who left an agriculture abandoned by the British government to a painful restructuring exacerbated but not instigated by the failure of the potato crop during the second half of the 1840s.<sup>5</sup> Their arable plots were consolidated into pastoral farms and they were tossed into the British urban labour market where they made new communities for themselves in the largest cities of England and Scotland.

The pioneers of the new suburbanisation of the late century were the middle class, the lower-middle class and the skilled working class. Clean industries, garden suburbs and new versions of the pastoral ideal shaped these new periurban spaces. The suburbs brought a new emphasis on domesticity with a clear separation of the male spaces of production from the female spaces of reproduction.

The creation of new urban spaces carried both intended and unintended consequences for the dynamics of population change. Aside from the physiological effects of work, fertility comprises an area where the impacts of industrialisation on population were largely intended. It could be argued that in the early industrial period fertility responded to opportunities for family formation which were shaped, in large part, by fluctuations in real wages. In the eighteenth century the growth in economic opportunity is reflected in a decline in the age at first marriage for women of between two and three years, sufficient to raise fertility by about one fifth.<sup>6</sup> The



## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

sensitivity of the marriage rate to economic fluctuations continued through much of the nineteenth century.<sup>7</sup> In the new industrial towns and cities, the availability of work for women and children changed the economic calculus of marriage and fertility. The gender relations at work interacted with those in the community to produce gendered urban cultures which in turn had an independent effect upon families not directly engaged in the locally dominant industry.<sup>8</sup> In this regard, the creation of new ways of life in the suburbs was of particular importance for fertility. Here, in Szepter's phrase, were new 'communication communities', installing new norms and rearing new types of families. The relationship between suburbanisation and fertility decline is a close one.

To a far greater extent, changes in mortality represent a set of unintended consequences flowing from the new urban-industrial society. Rural mortality in the eighteenth century remained in part under the control of population density with the people of remote, upland districts having significantly better life expectancy than their cousins in more densely populated, lowland districts, particularly if the latter were estuarine or marshy.<sup>9</sup> Certainly if one looks at the patterns of epidemic disease, the urban penalty in early modern times is a function of connectivity. The best connected places enjoy the greatest throughflow of people and thus the largest volume of contagion. In a sense, cities are subject to epidemic overload in a way that the countryside was not. Urban epidemics burned themselves out before they could be sure of saturating rural areas with infectives. A contact model best accounts for the urban primacy effect of epidemic disease in the eighteenth century.

To a larger extent than before, the industrial city sustained the conditions for a greater endemicity of disease. These were ecologies, both human and natural, wherein diseases could thrive. As communities grew larger, the chances of perpetuating childhood diseases, for example, grew. The cities were less reliant upon the importation of disease although many diseases were still so introduced. Yet the conditions which made a periodic visitor like chol-

Gerry Kearns

era welcome were the same which gave other diarrhoeal complaints the perennial freedom of the city. In terms of urban conditions, there were, by the middle of the century, significant differences between some of the older and some of the newer cities with many of the worst slums to be found in the former. In terms of epidemic overload, there still remained differences between large and small cities with the latter less effectively plugged into the swirl of infectives through an increasingly international urban labour market. The new industrial spaces of the early twentieth century introduced their own suite of mortality gradients between light and heavy industry and between the inner city and the suburb.

To speak of mortality as beyond the direct control of individual is but one side of the coin for on the other side we must consider the increasingly effective collective management of urban spaces. Our three phases of industrialisation correspond in broad terms to three distinct periods in the development of public health policies.<sup>10</sup> The eighteenth century was a period when collective obligations in the field of public health were recognised primarily in the form of quarantine regulations against epidemic disease. These measures were still in place during the first cholera epidemic of 1831–32.<sup>11</sup> By the time of the second epidemic in 1848–49 a rather different approach was taken with a greater emphasis on the environmental preconditions for the spread of disease rather than the on the routes of its introduction.<sup>12</sup> This strategy came under pressure in the later nineteenth century as a more ‘medical’ but also more individualistic model came to prominence.<sup>13</sup> This new model placed greater emphasis on individual responsibility with a concern for behaviour as a predisposing factor for the transmission of disease and it placed greater emphasis on general medical practice as the main public interventions were increasingly curative rather than preventative in intention. The different models of disease which underpinned these distinctive, although overlapping, strategies conceived of cities in quite different ways. For the contagionist quarantine policy, the city was a node in a network. For the environmentalists, the city

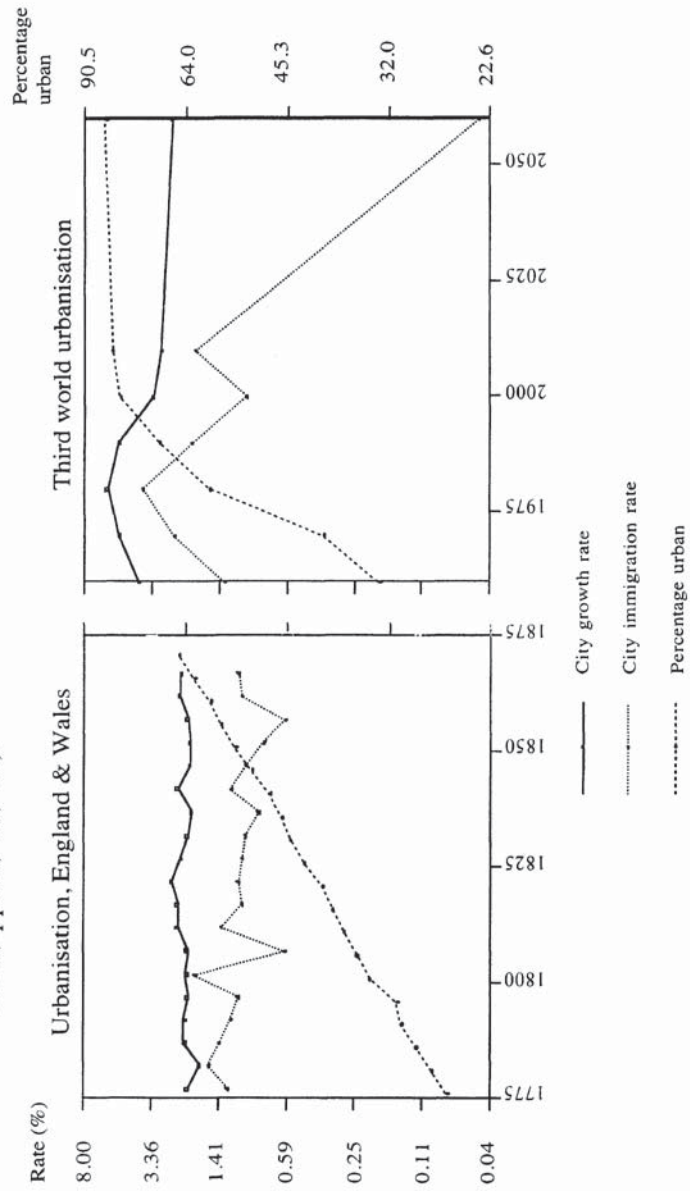


## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

was an ecological unit. The new medical and curative approach treated cities as elements in a hierarchical order through which services were organised and distributed.

There is still a lot of work to be done in quantifying the demographic differences between the phases of industrialisation and there is still a need for comparative studies which would establish the distinctiveness of each country and region in the light of such a general and oversimplified model. Some things seem clear, at least for England and Wales. The urban mortality penalty was severe and was suffered even in places of modest size in the early stages of industrialisation. It did not disappear until early this century when it was converted into an urban mortality benefit. Rural areas beyond the epidemic flux of city systems could be very healthy in the early industrial period; the healthiness of eighteenth-century rural Ireland is striking. England was heavily urbanised *before* industrialisation and its urban surge during industrialisation was quite modest compared to the rate of urbanisation characteristic of poorer countries today. Figure 2 shows that whereas it took about eighty years for the urban share of the population of England and Wales to rise from one-third to two-thirds, the third world has managed the same transition in about half that time.<sup>14</sup> The rate of growth in English cities was never as impressive as the current acceleration of urban growth in today's poor countries and it is natural increase, not continued in-migration which will keep third world cities growing faster than their earlier English counterparts.

Figure 2. *Urbanisation in England and Wales and recent and projected trends for the Third World (after Williamson, 1990, pp.22, 23, 26).*



## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

It is also clear that when industrial methods were applied to the provision of urban infrastructure, in particular cast-iron pipes, the urban environment was transformed to a degree which meant that by the late nineteenth century a well-equipped large city was a much healthier place to live in than the scruffier, smaller, provincial town. One of the significant challenges facing population historians is the need to integrate their demographic measurements with broader questions in social and economic history. There are many ways of attempting this from the econometric approach of Williamson to the cultural approach of Szreter. In the rest of this article, I want to explore just one of these and this is the treatment of the urban environment as a place of demographic risk.

### *Vulnerability, hazard and risk in the industrial city*

In an important work on disasters, Blaikie, Cannon, Davis and Wisner argue that too much attention has hitherto been paid to the purely external and seemingly natural aspects of ecological and physical catastrophes.<sup>15</sup> They suggest that we focus both on the hazard, the more or less exogenous shock, and on the social distribution of vulnerability, the endogenous fault-lines along which the hazard will wreak its most serious destruction. They suggest we conceive of those at risk from 'natural' disasters as being caught in a pincer action between exogenous hazard and endogenous vulnerability. The social distribution of vulnerability is a compound of various social and economic processes operating over the long and the short term. In particular, they propose that we distinguish between the immediate unsafe conditions in which many are placed and the more fundamental root causes which explain why so many and why these people are so positioned. Root causes are the fundamental inequalities which shape the distribution of the costs and benefits of economic development. The root causes, then, shape the dynamic pressures which are the form in which economic de-



Gerry Kearns

velopment seems to impress itself upon society. These dynamic pressures are the proximate determinants of the unsafe conditions in which many people find themselves.

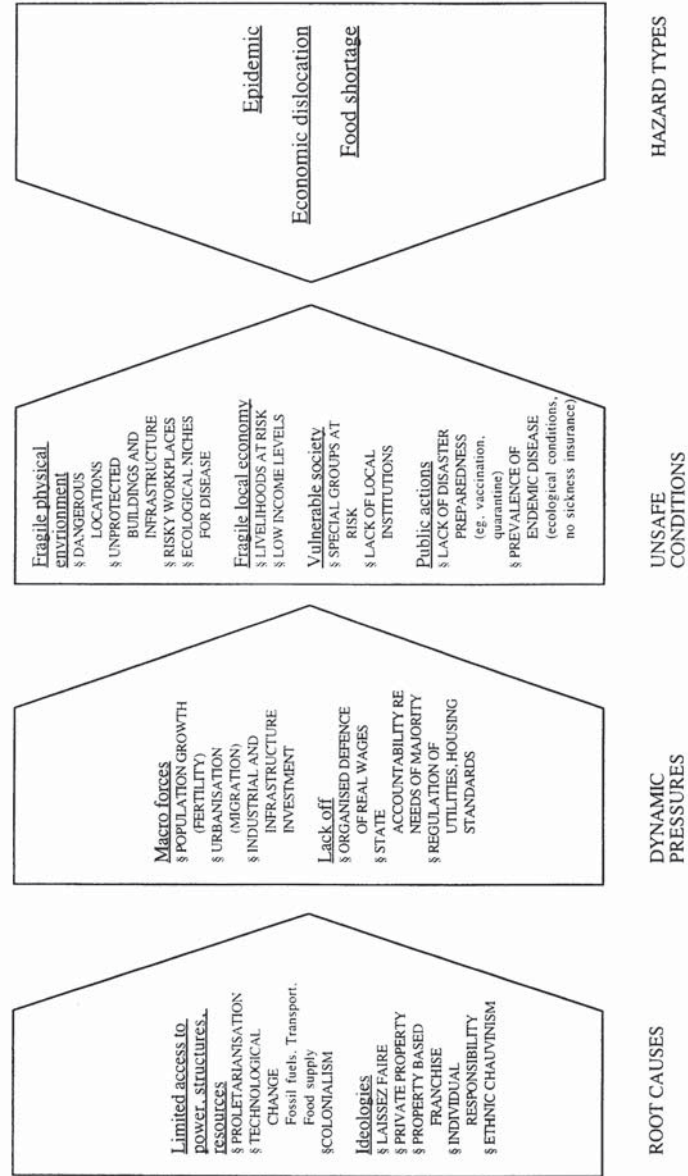
We may view the sickness and death of the urban penalty as a disaster in these terms. Several groups were at risk with some more so than others but in understanding how society responds to risk we need to acknowledge that the idea of collective danger is always viewed in ideological terms. In other words, while threat may be spoken of as collective it is always experienced by an individual located in a particular social context. To some extent, risk is an ideological construct because people slide uneasily between individual fear and collective claim. I see my worries as important enough to be taken seriously by others, indeed I may even see them as a general concern in their own right. The other reason why risk is an ideological construct is because questions of life, death, survival and collective obligations draw upon other blatantly ideological constructs such as god, property and responsibility. Alongside the social distribution of vulnerability, then, there is a social construction of risk whereby the hazard is itself perceived and thereby responded to.<sup>16</sup> These social constructions exist in an ideological force-field subject to the pulls of class, gender, ethnicity and age as these are mediated through political, religious and historical views of how the world should or does work. Demographic risks, then, are made meaningful in specifically ideological ways as in the way environmentalist interventions had to negotiate the prior claims based on the rights of the owners of urban property whereas the municipalisation of water supplies had to deal with those of water company shareholders.<sup>17</sup>

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

### *Hazard types*

Figure 3 is an attempt to recast the problem of the urban penalty in the terms used by Blaikie *et al* in their discussion of vulnerability and hazards. Some of the critical 'exogenous' shocks producing heightened urban mortality are shown on the right-hand side of the diagram. Food shortages could create critical conditions for early modern cities but their potential for focused revolt gave governments and monarchs every reason to secure them provisions, even at the cost of rural areas. Economic dislocation more generally was more characteristic of the industrial period with its gluts, panics and depressions. Its potential for sending hungry and unemployed families wandering in search of food and work represented a danger for the larger cities to which the desperate made their way with disturbing despatch. The tramping unemployed stirred the epidemic pot whirling infectives into the company of infectibles throughout the urban system. Finally, the greater connectedness of places brought exotic diseases such as cholera as epidemics from their distant endemic heartlands. Better communications brought more and more places into a common disease pool and circulated more effectively among them diseases such as smallpox, influenza and diphtheria so that few places were safe from the epidemics which threatened to turn pandemic. It would be possible to explain how each of these exogenous shocks was perceived as a threat of a quite particular type in different places at various times in line with local and national political cultures. In other words, we could develop the idea of the social construction of risk to explore how these dangers were made meaningful. Here, however, I want to follow Blaikie *et al* and treat ideologies largely in terms of their role in justifying fundamental inequalities in access to power and resources. In other words, I want to look in a little more detail at the social distribution of vulnerability; who and where were most at risk from the urban penalty?

Figure 3. *The urban penalty: risks, hazards and vulnerability* (after Blaikie et al, 1994).





## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

### *Root causes*

Turning to the left-hand side of Figure 3, we can see that the model proposes that the root causes of vulnerability lie in inequalities of power and resources which are in turn justified by basic ideologies. In the case of the English industrial city, we may identify many such inequalities but I have highlighted three bases of inequality: proletarianisation, technological change and colonialism. Of course, there were many wage labourers before industrialisation but never before had so few people had so little recourse to any means of keeping body and soul together outside the wage contract. In the new cities there was no access to the food resources of common lands, little room for the keeping of domestic animals and few workers with even minimal control over the means of production. This meant that economic depression hit home without the cushion provided by these earlier resources. Workers were caught between Scylla of exploitation and the Charybdis of unemployment. This powerlessness in the workplace was replicated outside by a political process which empowered those with property, granting them the franchise, while suggesting that those without property had no valid stake in society.

The technological changes of the industrial period brought their own inequalities. As machinery became more complex and factories grew, capital and labour went into lumps. The large-scale entrepreneur became more common. Canals, railways and better roads meant that cities could be provisioned from more distant places but they also meant that more local food production could be earmarked for higher-priced markets increasing the vulnerability of local food supplies under the pressure of more distant economic opportunity. This geographical inequality was felt particularly in Ireland during the famine when starving people struggled to understand the justice of an economic system which sent the corn that they had grown to feed English factory hands. In this case, colonialism represented a further layer of inequality. Despite formal inclusion in the British state through the Act of Union of 1800, the

Gerry Kearns

Irish were only ever second-class citizens both on grounds of their Catholic religion and on the grounds of the minimal representation they were allowed at Westminster.<sup>18</sup> This was crucial when it came both to responding to the famine of the second half of the 1840s and to dealing with the consequences of poverty in the Irish districts of British cities.<sup>19</sup>

Such inequities were in turn made meaningful and sustained by a set of related ideologies. These world views supported class and ethnic social distance. For many people, the chasm in life chances did not call the social order into question because of these more basic beliefs. A commitment to *laissez-faire* as a law of nature placed a taboo upon certain sorts of intervention in the economy, particularly many of those which might have addressed the injuries of class. The treatment of private property was close to idolatrous and it was shored up by a franchise, both at local and national levels of government, which gave political voice exclusively to those owning property. Alongside these affirmations of the rights of the owners of property to treat their workers or tenants according to the dictates of short-term profitability, there were other sanctions laid upon acting otherwise. In the first place, a stern individualism urged the dangers of charity. Only if people were left to reap the harvest of their own foresight or improvidence, would they learn the virtues of prudence and diligence. In the case of the Irish, this stony heart was reinforced by an ethnic chauvinism which incorporated, at various times and for various groups, religious bigotry, cultural prejudice and racism.<sup>20</sup>

### *Dynamic pressures*

These disadvantages and privileges shaped the dynamic pressures which bore upon urban life. Proletarianisation clearly structured migration, the dispossession of the Irish tenant being one of the last of the great clearances. The new relations of work and community

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

redrew the conventions of family formation and thus the context of fertility choices.<sup>21</sup> The new technologies and the priorities of capital established the priorities of industrial and urban infrastructural investment. In other words, the new urban ways of life would have been quite different were it not for the inequities which I have sketched. Of course, some of these matters did improve but if we consider how they did so we can see what was missing for many at mid-century. Poverty was a fundamental constraint on the safety of urban life. The rise of organised labour began to put a floor under urban wages in a way which left more to spend on housing, for example, and gave more landlords the opportunity of providing a better product to a more prosperous set of clients. Similarly the broadening of the franchise beyond the propertied to, first, the male skilled working class, then the entire working class and, finally, in this century to women provided the electoral pressure which shepherded through parliament the liberal reforms of early twentieth century with their defence of housing standards and their elementary provision of sickness and unemployment insurance. Responding to similar pressures, the regulation of urban utilities in the interest, initially of commercial and bourgeois concerns, and later the regulation of housing standards for the benefit of a broader swathe of the population, saw salubrious urban living become a realistic expectation for an ever wider part of society. Yet most of these measures were only comprehensively enforced early in the current century and the need for them indicates some of the constraints upon urban improvement at mid-century. The growth of urban-industrial society took place, for the large part, without this set of essential regulations making the city a dangerous place for all and a fatal place for many.



Gerry Kearns

### *Unsafe conditions*

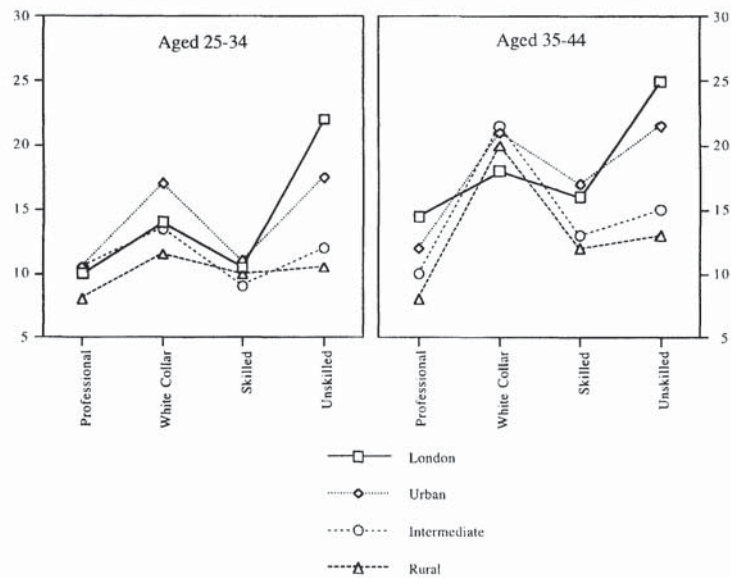
If we turn, now, to the unsafe conditions in the Victorian city, it is clear that these might include a wide range of matters related to the unequal impress of the dynamic pressures upon people's lives. First, we can look at the physical environment of the city. Industrial and residential developments left many unsafe spaces, holes, cesspools, ponds and ditches into which people might, and did, fall. Not all the urban fabric was new and older or jerry-built houses did fall down, sometimes upon their inhabitants. Workplaces bristled with unfenced machinery exacting its own grisly toll. Overcrowding in lodging houses left many sleeping in dangerous intimacy with a host of respiratory complaints. Lack of even basic street drainage and the total inadequacy of scavenging as a means of excrement removal produced a situation in which gastro-intestinal diseases were endemic.<sup>22</sup> Contemporaries were speaking in more than metaphorical terms when they spoke of tenement slums as the seedbeds of disease. Here there were a set of overlapping human and non-human ecologies in which bacteria could thrive and viruses could be passed around from person to person. In a sense, this was the background sickness and mortality on top of which certain events precipitated particular disasters and certain acute conditions upended the most vulnerable into a disease stew from which there was little hope of escape.

The vulnerability of some people was exacerbated by their uncertain ways of making a living. Some groups were dependent upon most insecure employment from those who were subject to havoc that the weather played with the demand for casual labour in the docks to those who relied upon the more seasonal areas of the informal economy. Poverty was itself a source of vulnerability for it left people with few reserves to draw upon in time of difficulty whether that was precipitated by a cyclical upturn in bugs or a downturn in work.<sup>23</sup>

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

It is also talk about social as well as economic vulnerability. Some groups were placed in particular danger by social or cultural factors. For example, anti-Irish prejudice contributed directly to their marginalisation by poor law authorities so that, fearing repatriation, the Irish stayed away from many of the institutional resources to which they were in fact entitled. This in turn meant that they forewent the hospital care which might have slowed down the spread of fever among them. On the other hand, in certain cities there was a distinct lack of institutional provision altogether leaving all the poor beyond the reach of hospital care and their homes beyond the reach of inspection and regulation.

Figure 4. *The crude death rates for males in different social groups, 1871.*



Gerry Kearns

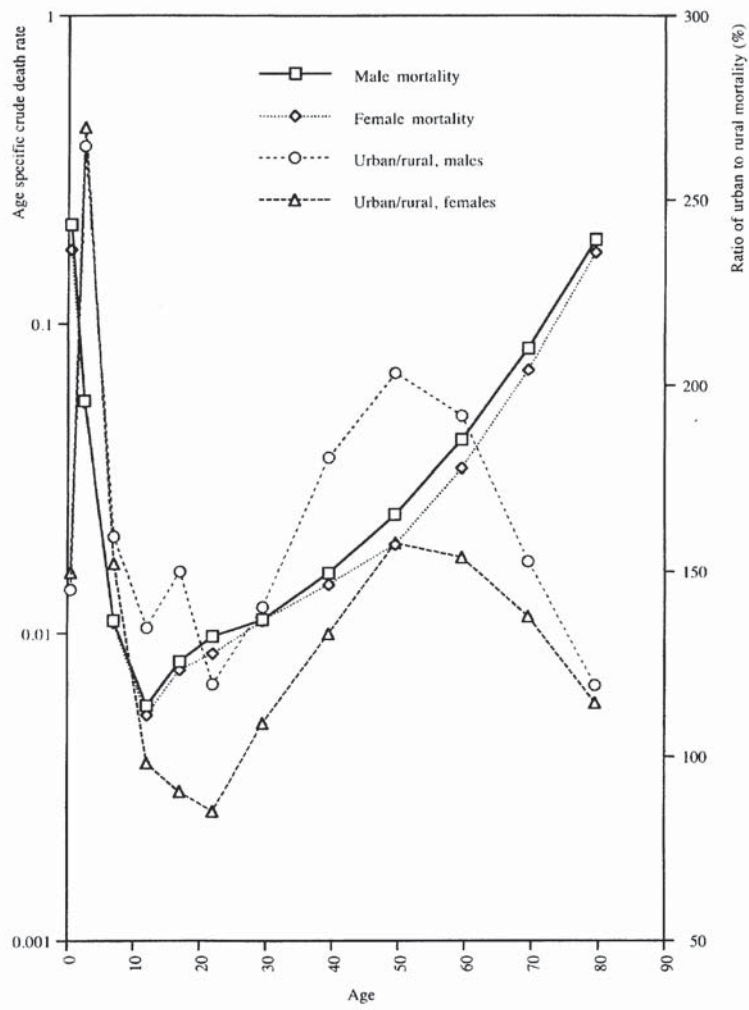
Figure 4 shows some of the consequences of this social distribution of vulnerability. The basis for the classification has been described elsewhere.<sup>24</sup> In this diagram, urban refers to places outside London with a population of more than 50,000 by 1851 and rural refers to places with more than 50% of adult males in agriculture at the same date.<sup>25</sup> The white collar group is dominated by clerks and the unskilled group by general labourer. There are, of course, very few white collar and professional workers in the rural districts and the rates are somewhat unreliable on that account. There are a number of problems with this whole analysis but the overall patterns are interesting. The health divide between the unskilled and the rest was greatest for London and the urban areas and least for the rural areas. There was a geographical gradient within classes although it was greatest for the unskilled. If we look at the geographical gradient for professionals aged 35–44, it is clear that a move from London to surrounding periurban or even rural areas would effect a reduction in mortality of a third or even a half. That was the mortality premium of suburbanisation.

Alongside the social distribution of vulnerability across classes, we must also consider the differential force of the urban penalty across the family life-cycle. Figure 5 shows the pattern of age-specific mortality in the large towns (all those places outside London with a population of 50,000) of England and Wales in 1851. The picture is a familiar one with high infant and child mortality, relatively healthy young adulthood and high mortality again in old age. Infant mortality was a little higher for males than females but child mortality was much the same. Young adulthood was a time of worse male than female mortality. The sex-differential closed again in the thirties before widening again in the fifties and sixties. These differences are all the more striking when rural and urban mortality are compared. Taking as rural, all those places where at least half the male workforce was engaged in agriculture, the relatively heavy mortality among rural women exaggerates still further the gender difference in young adulthood.



DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

Figure 5. *The urban penalty across the life cycle, the large towns of England and Wales, 1851 (after Kearns 1993).*



Gerry Kearns

Infant mortality was some 50% higher in these urban than in the rural areas and this was true for boys and girls. Child mortality was 150% higher in the towns and again this held for both sexes. But for teenage girls and young women the towns were somewhat healthier than the countryside. Not so for men with young urban men in their early twenties mirroring infants in having mortality rates some 50% higher than in the countryside.

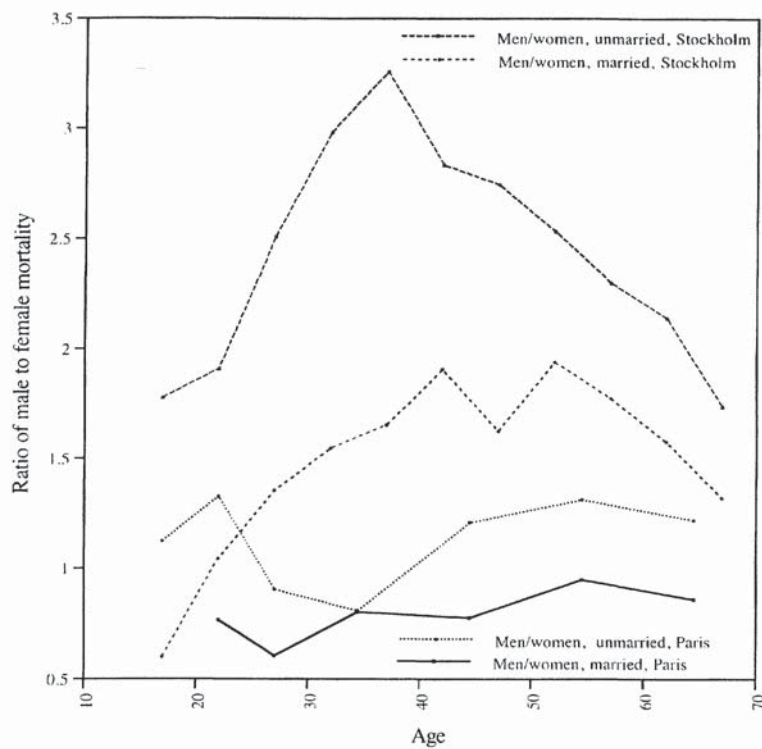
For both sexes the urban rural differential deteriorates from the thirties to the fifties showing, I would suggest, the importance of insult accumulation in grinding down urbanites. Whatever the causes of vulnerability in the city, they bore particularly heavily upon children, upon young men and then they built up during adulthood for both men and women. This distinctively urban pattern of the contagious diseases of childhood has been mapped by Woods and Shelton.<sup>26</sup> The intensive contact networks of cities were ideal for the transmission of scarlatina, scarlet fever, diphtheria, measles and smallpox. The vulnerability of young men may owe something to the contrast between the living conditions of young women in domestic service compared to young men in lodging houses. This supposition is given added force by the fact that we find the sex differential to be greatest for young unmarried people, where we can in fact measure this. Figure 6 gives some results from Paris and Stockholm taken from the early and late nineteenth century, respectively.<sup>27</sup>

Clearly something quite exceptional was going on in Stockholm where insecurity of male work not only discouraged women from forming legal marriages with men but also gave rise to living conditions for men in lodging houses which produced excessive male mortality over the whole industrial period.<sup>28</sup> Whatever contributed to this male mortality it operated more particularly upon unmarried men. In fact, young married men even enjoyed a mortality benefit over their wives. The experience of Paris was less extreme but, there too, young unmarried men suffered in comparison to single women whereas the reverse was true for their married counter-

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

parts. The implications of these differentials are significant and they go a long way towards explaining why elderly widows were such a large part of the institutionalised pauper population in industrial cities.

Figure 6. *The ratio of male to female mortality for married and unmarried adults, Paris (1817–18) and Stockholm (1891–1900) (see text for sources).*





Gerry Kearns

State intervention could be vital in protecting people against this hazardous urban environment. The provision of safe and plentiful water supplies, for example, offered security against the threat of diarrhoea during hot, dry summers. In this regard, we can talk of the recurrence of hot, dry summers as a something of a sanitary test for municipal drainage, sewerage and water services.<sup>29</sup> Similarly, the return of smallpox in epidemic form tested vaccination provision. The provision of sickness insurance enabled some people to stay from work when ill, thereby improving their chances of recovery while protecting their colleagues from infection. Institutional provision developed security systems which cocooned the urban resident from the worst predations of the city. As provision improved cities crossed certain thresholds relieved to have put behind them some of the worst crises of an earlier age. Yet all these forms of institutional provision require maintenance and renewal. This hazards perspective directs our attention to the ways that even in today's rich countries, urban disease hazards are kept at bay rather than rendered extinct. If parents lose faith in vaccination, children can once again be placed in danger of falling victim to contagious diseases. If resistance to paying local taxes means that municipal governments fall bankrupt, the urban infrastructure will not be maintained and faecal-oral transmission of bacteria will be promoted by cracked sewers, inadequate water and shoddy housing. In this sense, the lessons of history hang like a heavy responsibility around the necks of the citizens of today's cities.

## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

### *Notes*

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Gerry Kearns

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## DEMOGRAPHY AND INDUSTRIALISATION: A GEOGRAPHICAL OVERVIEW

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