

Introduction

In an 1876 address that was reported in both the medical and popular press, the newly inaugurated president of the Society of Medical Officers of Health, Dr. George Buchanan, spoke to his colleagues about “Citizenship in Sanitary Work.”¹ As one of the first medical officers of health in London—appointed in 1856 at the parish of St. Giles in the Fields—and at the time an assistant medical officer to the Local Government Board, Buchanan had been steeped in the public health problems of English urban life for two decades.² Despite this wealth of experience—or more likely because of it—that October Friday night Buchanan drew inspiration from the American state of Massachusetts. He pointed to the great strides in sanitation since the formation of the Massachusetts State Board of Health in 1869. Buchanan recounted at length the part played by the board in the recent establishment of an abattoir in the neighborhood of Brighton, which had lately been annexed by the city of Boston.³ The board’s attempt at nuisance control had met with predictable resistance from local butchers, but by 1876 the city had an exemplary facility that, remarkably, found favor with the butchers and was ready to be administered by the city of Boston itself.

So what did Buchanan want his metropolitan audience of medical officers to take from this transatlantic story? Certainly he made no attempt whatsoever at comparison with the regulation of the meat trade in Britain.⁴ Rather, his message concerned the broader philosophical issues of compulsion and citizen participation in public health matters. It was, Buchanan observed, through the careful formulation and implementation of compulsory legislation that the Massachusetts Board of Health was able to intervene against slaughterhouses. The board was encouraged by petitions lodged by Brighton’s inhabitants, who were fed up with blood running in the streets and the offensive stench of offal. In the very same spirit of commonweal, Bostonians had lobbied successfully for the creation of a local board of health for the city in 1872.⁵

“I have told the story of Massachusetts’ sanitary progress very badly,” Buchanan said, “if there is any need to point its moral for ourselves.”⁶ Of course, he spent the rest of his speech doing exactly that. And the moral was this: the need to educate ignorant and careless people in the individual and community-wide benefits of sanitary reform. As Buchanan saw it, Britain’s problem was that general national laws did not cover all the aspects of public health that concerned a local community. Local bylaws, meanwhile, only dealt with a limited range of topics. So, the key to filling this vacuum in Britain’s efforts to solve

urban health problems was to raise the sanitary consciousness of the public, with the intention that the community would take a more vocal and active role in its own government.⁷

Buchanan sketched out how a diligent medical officer of health (MOH) should communicate knowledge by writing reports in an accessible manner and by participating at public meetings. Health officers might also help organize local societies that promoted public awareness of sanitary subjects through lectures and pamphleteering. How to get scientific knowledge across to the lay public was a knotty problem for Buchanan and his colleagues, but he was excited about the potential to do so. According to him, greater public interest in hygienic matters would make for a robust political culture of citizenship because “people will understand better their rights as well as their duties in local self-government.”⁸

To illustrate the importance of community participation in sanitary matters, Buchanan concluded his address with the matter of infectious disease notification:

A community wants to take all possible precautions against scarlet fever, and to begin by making a municipal law that every householder shall inform the sanitary officers of the existence of the disease. Why should it not be able to order this, and to take any like action that it considers suitable to its circumstances? And why should it have to wait, for its proper security, until Parliament has come to the conclusion that it may exceptionally be endowed with the required authority, or until Parliament is pleased to consider such course of action fit for enforcement everywhere throughout England? The direct right of a local community, while subject to general law, to make for itself what additional law it considers necessary for its sanitary welfare, is at present but imperfectly acknowledged. . . . Without such a right, admitted and acted on, a city arranged by Hygeia herself would presently fall short of the ideal of the goddess.⁹

Did Buchanan pluck this example randomly from thin air? Hardly. In that same year, 1876, the Yorkshire town of Huddersfield had introduced the first local legislation for infectious disease notification. Meanwhile, other towns—Bolton in England, Greenock in Scotland—were preparing to take local improvement bills to Parliament in 1877 that also incorporated the measure. These pioneering forays into the systematic reporting of infected people to local authorities were copied by many other localities in the 1880s and 1890s to the point where a nationwide mandate was eventually passed into law in 1899. For the likes of Buchanan, local interest in infectious disease notification was a victory for a “participatory” public health that championed the rights of householders across the country. Buchanan spoke of citizenship as the right of a local community to protect itself, adding that members of a community had a responsibility to report cases of infectious disease. This should not surprise us; after all, what is the politics of public health in modern democracies about if not the balance between rights and responsibilities, and between the competing interests of individuals and communities?¹⁰

But citizenship is not a static concept. It is subject to perpetual negotiation. Political conflict over citizenship was particularly intense in the lead-up to the 1867 Reform Act, just at the time when public health, as an organized response to the challenges posed by urbanization and industrialization, was becoming embedded as a state practice.¹¹ Historian Keith McClelland has quite rightly ring-fenced the preeminence of political considerations as the respectable workingman's portal of entry into citizenship, but he does nevertheless reiterate that

a much fuller account of working-class politics and the relationship of it to the wider patterns of political and social formation . . . would need to say something about how this figure [the citizen] came to be defined not only by some social and economic forces and by his own manner of self-presentation, but also by other agencies . . . [and would need] . . . to examine the impulses from civil society that differentiated the sober, respectable and desirable male figure and his family from others and that situated him as a suitable object for social inclusion and even celebration.¹²

McClelland's own brief list of "impulses from civil society" includes the Temperance Movement, the New Poor Law (since it punished the able-bodied man who did not, or would not, work), sanitary reform, and the regulation of prostitution through the Contagious Diseases Acts. There are, of course, many other "impulses": from the realm of public health I would readily add the campaign against compulsory infant smallpox vaccination in which antivaccinationists argued for their rights as parents to withhold their children from vaccination, whereas provaccinationists saw vaccination as a form of community participation that granted entry into the national polity.¹³

Rather than thinking of citizenship as the political expression of an individual's relationship to the nation-state, McClelland and Sonya Rose hint that it is much more productive to frame it "as a language by means of which people can make claims on the political community concerning rights and duties, political and moral or ethical practices, and criteria for membership."¹⁴ This notion—that questions of citizenship need to be seen through a variety of nonpolitical lenses—has been reiterated for the mid-Victorian period by Martin Pugh, who argues that legislation in the post-1868 Gladstone era was very much concerned with removing barriers to individual development for those who paid rates and taxes, respected the law, and actively sought to help themselves.¹⁵ These three criteria are helpful in thinking about citizenship as related to matters of public health because they were tangled up with it: property taxes (i.e., rates) funded the expansion of public health activity; laws (some of which were contested, as we shall see) enabled and circumscribed public health and people's relation to it; and self-help was both assisted and challenged by public health.

The sort of disease reporting Buchanan wanted was imbued with the question of citizenship because the interventions it facilitated reconfigured hygienic and sanitary norms.¹⁶ It did this in a number of ways: a physician's hitherto confidential diagnosis of infectious disease was made public property; the movements of infected and uninfected people across space were circumscribed;

infectious patients were removed to hospital using force;¹⁷ the behavior of those patients and their visitors was regulated; and parents were held accountable for the prevention of infectious disease in their offspring and its transmission to other children. The rights and freedoms of citizens became conditional on their responsible conduct in the face of infectious disease. What sort of freedoms are these? Eugenio Biagini has questioned the assumption “that classical liberals followed Thomas Hobbes in believing that ‘liberty is the absence of restraint.’ . . . *Popular* liberals held quite a different concept of liberty—one characterized by an emphasis on ‘civic virtue’ and participation and indistinguishable from what is commonly described as the ‘republican tradition.’”¹⁸ One of the key themes of *Intrusive Interventions*, then, is that public health mediates liberty and government on multiple levels of civic virtue and participation. In other words, “freedom” means the freedom of the local state to govern autonomously,¹⁹ and the freedom of individuals to live without interference from the state.

Historians of Victorian liberal governmentality have used the insights of Michel Foucault to study the rationalities and technologies of nineteenth-century urban government, of which public health was an important part.²⁰ However, in a simultaneously trenchant and sympathetic critique of this approach, Simon Gunn has argued that the focus on the exercise of rule through freedom has operated at such a level of abstraction that it leaves “unanswered the question of how historical change occurs and who or what contributes to it.”²¹ I agree with these sentiments (though it has to be said that studies of liberal governmentality are *very* much concerned with the “how”), so the approaches of pioneering social and political historians of the British urban local state, such as Peter Hennock, are no less relevant to how I want to tell the story of infectious disease surveillance than are those of historians adopting a Foucauldian framework.²²

Moving toward the particularities of public health in this way also represents a response to the recent observation made by Michael Worboys that historians need to think more about the *practices* of science in the history of medicine. Referring to the agenda for his groundbreaking book *Spreading Germs*, Worboys says:

I focused on new procedures such as antiseptics, disinfection, and isolation, which were targeted at the ways germs passed between and into bodies. In charting how approaches to prevention and treatment moved from being inclusive and multifactorial to being exclusive and focused on single factors, I gave relatively little attention to the techniques, methods, and operation of germ management in the clinic, laboratory, and field. . . . I now know that I missed a trick with regard to all of my themes: I could, and should, have said more about the performative aspects of the germ practices—that is, the techniques, materials, and methods of germ management.²³

Part 1 of *Intrusive Interventions*, “Making Infectious Disease Surveillance,” chronicles the administrative-bureaucratic interest in the creation of a system of sickness registration that eventually morphed into infectious disease notification. Part 2, “Spaces of Risk and Opportunity,” constitutes the “doing” of infectious

disease surveillance and deals with the “performative aspects of the germ practices” that Worboys feels escaped him (with the qualification, of course, that such practices were not necessarily thought of as germ based).

One advantage of contemplating practice is that it draws us more fully into the messy world of social relations. Take the questions of coercion and resistance; or, in the language of governmentality: “counter-conducts,” the protests and struggles “against the processes implemented for conducting others.”²⁴ These have been relatively underplayed in histories of Victorian British public health, apart from the somewhat exceptional and well-documented examples of compulsory infant smallpox vaccination and the Contagious Diseases Acts.²⁵ Indeed, in contrast to these high-profile campaigns, historians have suggested that people accepted disease reporting and compulsory sequestration in late Victorian Britain as part and parcel of a new public health rationality that trimmed their traditional freedom to be left alone, sick or not.²⁶ Eugenio Biagini has asserted that, in more general terms, the “task of reconciling liberty and community, individual rights and social control turned out to be simpler in Britain than anywhere else in Europe, with the exception of Switzerland and the Scandinavian countries.”²⁷ *Intrusive Interventions* attempts to refine this somewhat sanguine historical picture by tracing the contentious debate that centered on infectious disease surveillance’s articulation of state coercion and its interference with the moral character of family life. There was substantial pushback against its attack on traditional modes of domiciliary patient care (an approach that was partially reversed in the early twentieth century in the case of tuberculosis, as outlined in chapter 6). In sum, the piecing together of infectious disease surveillance—which in the mid-Victorian period was by no means a given and had no identifiable end point—put liberal subjectivity at stake.

Documenting practice also allows me to address historical scholarship that has suggested bacteriological knowledge solidified existing public health activities and somehow made them more palatable to the general public. I want to pose an alternative to this form of technoscientific determinism. Bacteriology notwithstanding, infectious disease surveillance had to be continuously reshaped in order to negate the political fallout of coercion and interference. This was done through minimizing the impact of intrusion, maximizing the mobility and portability of public health technologies, embracing mechanical autonomy, and creating optimal conditions for the regulation of self-governing individuals.

Infectious Disease Surveillance

Intrusive Interventions explores how and why infectious disease notification came about. It documents the transition of notification from a locally determined measure to a full-blown law that was compulsorily enforced across the country. It also examines how the practices of isolation, disinfection, and contact tracing were assembled around notification. Despite their piecemeal implementation, patchy uptake, and partial origins in port authority control, these measures

taken together were recognizably characteristic of a national approach to infectious disease prevention that came to be known as the “English System.”²⁸ This book investigates how these techniques help us to think about a much broader set of issues related to the ideology and practice of public health and urban government, particularly to do with the freedoms, rights, and responsibilities of individuals living under the auspices of Victorian liberal democracy.

Sitting between the great age of sanitary engineering in the mid-nineteenth century and a supposed “new” public health in the early twentieth, the final decades of the 1800s were a transitional period in the history of British public health. Until relatively recently, the familiar version of events has been that a unified germ theory challenged and overturned some long-held beliefs and practices in public health. Obviously, the remediation of the public environment was never abandoned; but there was a shift away from the preoccupations of the sanitary movement toward the medical management of biologically dangerous individuals, a transformation that was wrought by a knowledge of germs produced in the laboratories of the bacteriological revolution.²⁹ This narrative of scientifically propelled progress has not gone undisputed. For example, Worboys’s study of the interaction between scientific knowledge and medical practice demonstrates that it is no longer acceptable to speak of a germ “theory” of disease, or even of a bacteriological “revolution” in Victorian medicine. Worboys dates the move toward person-centered policies to the early and mid-1870s, at least concurrent with, and in some cases preceding, the landmark discoveries of Louis Pasteur and Robert Koch.³⁰ At this time, influential sanitarians were advocating interventions such as disinfection and isolation that relied on the identification of individual cases—George Buchanan’s promotion of infectious disease notification in 1876 is a good example—through clinical observation, not bacteriological investigation (even though the language of intervention was sometimes infused with the embryonic language of germs).³¹

While the disinfection of people and their belongings and the sequestration of pathologically dangerous patients both have a history that stretches back centuries, the formalization of infectious disease reporting in the towns and cities of Britain that began in the 1870s facilitated these interventions on a scale that was historically unprecedented, at least outside of epidemic crises. Without infectious disease notification, public health authorities would have disinfected far fewer houses and would have had far fewer patients in their isolation hospitals. But disease reporting did not in itself create new forms of public health regulation; rather, it allowed for the more comprehensive implementation of laws that already existed.³² The compulsory removal of patients to hospital, the temporary closure of businesses thought to be sources of disease, and domestic visitations by the local sanitary police were all pretty much part and parcel of urban life before infectious disease notification came along.³³ Reporting diseases simply allowed more of these interventions to happen more frequently. In so doing, it justified an expansion of the local state’s budget on public health activities—why bother adopting notification legislation to identify even more diseased people if there were no hospitals to send them to.

This bundle of public health intrusions—notification, disinfection, and isolation—has been referred to as “exclusive” by Worboys, who contrasts them with the “inclusive” sanitary reforms of earlier in the century. Peter Baldwin calls them “neo-quarantine,” a neat expression that encapsulates the way in which a “traditional” form of sequestration was applied to the “modern” management of diseased individuals. Meanwhile, in his book on hygiene and public health in nineteenth-century France, David Barnes coins the phrase “sanitary-bacteriological synthesis” to characterize much the same set of ideas and techniques.³⁴

In a paper published in 1999 I broadly concurred with Worboys, Baldwin, and Barnes in saying, “Notification was *the* crucial policy development in the move toward the individualization of public health strategies in the late nineteenth century. Indeed the scientific therapies and bacteriological examinations that were adopted on a large scale would not have been possible without it.”³⁵ My own thinking on this, however, has changed over the years. While it is true to say that these policies certainly were more tightly focused on individuals with disease and the individual causal factors of disease, this did not mean that their object was as narrowly defined and “exclusive” as we have assumed. Here, I hope to provide a more nuanced reading that demonstrates how infectious disease surveillance opened up the multifaceted world of individuals to the intrusive scrutiny of public health. Nondiseased family members and friends of patients became the objects of education and supervision; domestic space was transformed into a specific focus of intervention; and the school came to be seen as a place of pathogenic exchange through which infectious disease was transferred between people, and from one part of a city to another.

Under these circumstances, to term such efforts that sought to break the cycle of disease transmission as having an “exclusive” focus on the infected individual does them something of a disservice. Baldwin’s invoking of “quarantine” (as in “neo-quarantine”) also seems restrictive and carries with it an implicit assumption about what quarantine itself was. Consequently, “surveillance” seems to be a more appropriate moniker; it conveys the far-reaching scope of public health that went way beyond the individualization of policies designed to prevent the spread of infectious disease. Surveillance is also more fitting than “neo-quarantine” because of our current understanding of it as the “ongoing systematic collection, analysis, and interpretation of health-related data for use in the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control.”³⁶ The volume and type of information used in surveillance today is, of course, extensive, and it is no longer confined to infectious disease.³⁷ However, the procedures referred to in contemporary disease surveillance systems were first developed and realized in the Victorian period, when a recognizably modern form of “surveillance” began to integrate clinical, epidemiological, and bacteriological intelligence in the service of interventions that traversed all aspects of social life.

Before mandatory national legislation for infectious disease notification in the late 1890s, surveillance constituted a set of measures that were adopted and

implemented locally, made possible by “bastard laws,” as the title of chapter 2 indicates. Although notification did extend to the vast majority of the urban population by that point, the experience of isolation and disinfection was not uniform across the country. If the uneven uptake of notification is anything to go by, the idea that municipal authorities were eager for a comprehensive system of surveillance seems questionable. Such geographical inconsistencies do indeed point to the importance of local political sensitivities in the determination of urban public health interventions. However, in her comparative study of Birmingham and Gothenburg, Marjaana Niemi came to the conclusion that public health policies were insulated “from political contention and conflict” by the authority of scientific knowledge.³⁸ Niemi argues that it was mainly because of a lack of citizen interest in the late nineteenth and early twentieth centuries that the field of public health was left to the devices of elected politicians (city councilors) and appointed officials (such as health officers and hospital superintendents) who set great store by expert knowledge.

Such an interpretation is only a partial version of events. I attempt to flesh this out by using archival evidence from a selection of English cities—Liverpool and Manchester in the northwest; Birmingham, Nottingham, and Leicester in the Midlands; and London—that reflect a variety of experiences with infectious disease surveillance. This evidence reveals, first, that the basic tools of surveillance were put in place well before their bacteriological logic was “scientifically” proven: disinfecting apparatus was mobilized, isolation hospitals were built, and schools were temporarily closed in the absence of anything like positive “scientific” confirmation that closure actually staved off infectious disease in the community.

Second, council chambers from one city to the next constantly reverberated to the sound of animated arguments about many areas of public health policy, and infectious disease surveillance was no different. Neither councilors nor MOHs can be said to represent undifferentiated constituencies. They each varied in the production, reproduction, and deployment of popular and expert knowledge about diseases and interventions. These forms of knowledge themselves varied widely in quality and, to use a more recent phrase, transferability. One might wonder why, *if* scientific knowledge *was* so obviously persuasive, elected and appointed public health officials across the country met with such varying degrees of success when trying to convince their fellow citizens of the benefits of infectious disease surveillance. The answer is that in a number of places counterarguments were made about how surveillance impinged on the interests of one group or another, or encroached on the rights and freedoms of ordinary people; sometimes, these groups and people were listened to and interventions were limited accordingly or abandoned altogether.

Third, the amount of political work that had to be done to create a viable space for scientific knowledge to operate should not be underestimated. In this respect, Chris Otter’s formulation of “inspectability” in *The Victorian Eye* suggests a valuable framework for understanding infectious disease surveillance. According to Otter, urban technologies became inspectable through the

principles of legibility, accessibility, portability, and agglomeration. Though I would define some of these in a slightly different way, and though I am concerned as much with the human-centered materiality of surveillance as I am with the nonhuman material aspects of it, Otter's principles do characterize rather well some of the tactics of infectious disease surveillance.

Otter defines *legibility* quite literally: for example, information about food and drink had to be clearly written and conspicuously displayed. These and other signs and labels made all sorts of inspection possible to both government inspectors and the general public. In the case of infectious disease, family practitioners authorized that the patient's body was sick. This legibility was expressed in the form of a named disease on a notification certificate that became the property of the state; but the causes and modes of transmission of many of these named conditions were open to dispute, and notification often forced this naming exercise on GPs when they would have preferred to avoid it.

Accessibility to subterranean and hard-to-reach sanitary hardware was increasingly built in to utility networks via inspection plates and chambers (manholes). For infectious disease, notification was equivalent to the manhole cover because it granted access to the hidden confines of domestic space and the family. For inspectors of infrastructural systems, mobile instruments of measurement and record were not confined to specialist devices, but included everyday items like feathers, balloons, pencils, and notebooks. Disease surveillance generated its own forms of *portability*. Ambulances specifically designed to convey infected patients to isolation hospitals are one example. Special carts for the transport of infected personal property are another. Other technologies of disinfection, such as pump sprayers, also had to be mobile to guarantee their effectiveness in domestic spaces (and, indeed, to enable them to pass easily through doorways and up narrow staircases). Municipal disinfecting teams also devised a handy paper system of documenting disinfection practice that could be taken on the road.

Finally, *agglomeration*. Otter develops this idea in relation to the inspectability of abattoirs, but it is striking that he uses a medical example to introduce it. By bringing patients together in a single space, he says, it "became possible to discern medical identities and differences that remained below the threshold of visibility when the sick remained isolated in the home or small hospitals."³⁹ This was certainly the case for isolation hospitals, as shown in chapter 3. In addition, agglomeration can be applied to the type of thinking about population that characterized liberal governmentality. As a leading public health figure, Arthur Newsholme stated in Baconian terms, "Knowledge was always power, and it was self-evident that any local authority using the information given it by notification, was in better position to adopt early preventive measures against the spread of disease."⁴⁰ But such information was more subtly instrumental than this. Within the hospital setting itself, the agglomeration of data from lots of patients allowed for interrogation of the natural history of infectious diseases that otherwise eluded the collective efforts of medical practitioners elsewhere.⁴¹ Furthermore, with increased knowledge of disease incidence in the community,

the calculation of case fatality rates became more reliable. These rates might be broken down by age and sex and compared and contrasted to death rates. In addition, localities with ongoing vulnerability to disease outbreaks could be identified even when case fatality rates were falling (as in the case of scarlet fever). In other words, the agglomeration of numbers calculated and recalculated the geographies of life, sickness, and death.

Spaces of Risk and Opportunity

Note how Otter's formulation is inherently spatial: accessibility, portability, and agglomeration are all geographical frames.⁴² In an essay review of Otter's *Victorian Eye*, historian Iwan Morus argued that if we want "to understand the cultures of Victorian surveillance and spectacle we need to understand their spaces and to understand those spaces we need to get to grips with their specific peculiarities and the particular regimes of production and consumption that sustained them."⁴³ It can hardly be doubted that infectious disease surveillance broadened the state's penchant for interfering in everyday life and interrupting channels of biological risk.⁴⁴ At the same time, it created, opened up, and shaped specific spaces to ideas about how freedom from infection, and the possibilities of life, could be achieved. As many spatial theorists have remarked, a deeper appreciation of the complexity of space is crucial in order to comprehend this exercise of power and the potentialities of freedom.

In an observation that is particularly salient to many of the themes addressed in this book, geographer David Harvey notes that "state apparatuses obsessed with identities, control, and surveillance turn again and again to the absolute conceptions of space and time as central to their mission of effective governance and control."⁴⁵ This understanding of space as *absolute*—that is, immovable, fixed, and mapped—is the means of pinpointing individual persons, things, and processes.⁴⁶ Yet, as Harvey argues, an absolute conception of space submerges much of what is, or could be, relative and relational. With *relative* space, the preexisting and bounded absolute spaces that are vital for individuation and governance—hospitals and schools, for example—do not go away, but they are conditioned by phenomena and processes within a space-time framework; they are historically spatial and spatially historical.⁴⁷ Spaces only exist in relation to other spaces, giving them multiple, not singular, geometries, depending on the location and circumstances of the observer and the observed. *Relational* space, meanwhile, is a means of thinking about the potentiality of space, focusing on processes that produce their own space and time in which identities are "open, fluid, multiple, and indeterminate . . . [which] is how we live day by day."⁴⁸

If we are to understand the meaning of a disinfection laboratory, an isolation hospital, or a school classroom of nonimmune children (at least for a particular slice of time), then we need to grasp the "relational politics of the spatial." "What if," geographer Doreen Massey has asked, "space is the sphere not of a discrete multiplicity of inert *things* . . . [but of] . . . a heterogeneity of practices and

processes? . . . Then it will be not an already-interconnected whole but an ongoing product of interconnections and not." Conceived in this way, space "will always be unfinished and open."⁴⁹ The multiple forms of sociospatial relations can be expressed along dimensions that incorporate scale,⁵⁰ place,⁵¹ and networks that do not necessarily privilege any one of these over the other.⁵²

I call isolation hospitals, disinfecting stations, laboratories, schools, and homes "spaces of risk and opportunity," because while they were marked out as biologically threatening, at the same time they were also spaces where potential citizens were educated in the management and regulation of their behaviors and social relations.⁵³ The simultaneity of risk and opportunity draws attention to the potentiality of *uncertainty*, which is precisely what gives these processes of regulation and management their power.⁵⁴ As Massey notes, it is not so much the openness or closure of spaces such as laboratories and homes (two kinds of spaces that she herself has studied) that should be the sociopolitical question; rather, it is the terms on which uncertainty is established. How are the range and nature of social relations constructed? What geometries of power are exercised? What trajectories of experience and knowledge are accessed and denied? What connections are made with and to other spaces? In other words—and it is something to which I aspire in my understanding of infectious disease surveillance—the absolute, relative, and relational spaces that public health works through need to be held in dialectic tension.

Health care is a spatialized enterprise. The vast majority of people in the mid-nineteenth century sought remedies for their illnesses from long-standing and intimate sources: the first resort for most ailments was the dispensary or apothecary, the general practitioner, the Friendly Society physician, the street vendor, or friends and relations.⁵⁵ Nevertheless, multiple sites existed for the consumption of health care. General and specialist hospitals and workhouses proliferated and continued to multiply in the Victorian city, and individuals' experience of ill health and health care doubtless became increasingly institutionalized. Chapter 1 reveals how, as part of a wider argument about the ways in which vital statistics could be used to govern urban populations, a bureaucratic process of sickness registration in the late 1860s and early 1870s culminated in the realization that the financial costs and biological risks of outdoor poor relief for infected people was unsustainable. This realization was very much predicated on the construction of a kind of environmental absolute space as a means of managing "vital geographies."⁵⁶ Just as large infrastructural projects of urban environmental and sanitary reform gathered pace, a parallel rationale emerged that poor and working-class people with an infectious or contagious disease should be documented, so that the wider community would benefit from having them cleansed, isolated, monitored, and returned to health.

Simultaneously, urban public health administrations were beginning to take concrete form across most of the country. The professionalizing cadre of public health professionals (appointment of an MOH was compulsory from 1875, but many towns and cities had one before that date) claimed a stake in this epidemic territory. Hospital superintendence and management materialized as a

significant public health activity and a legitimate route of career advancement for public health doctors. The number of isolation hospitals exploded, from a sprinkling of privately run fever and smallpox hospitals in the early years of the century to more than 700 just before World War I. These newer hospitals were built (or adapted from previous uses) by local authorities, often with the help of low-interest financing from the central government. The repayment of government loans and ongoing running costs came out of local property taxes (rates). As such, institutionalized health care became politicized in new ways.

The scale of routine aggregation of the infected was unprecedented. Certainly, people with infectious diseases had been hospitalized in the distant and not-too-distant past. Pest houses during plague epidemics in the fourteenth century, venereal disease hospitals in the early modern period, and cholera hospitals in the early nineteenth century are three obvious examples. With the exception of lock hospitals, which concentrated on a small, though historically important section of the population, these institutions tended to be only temporary structures and placed transient demands on local government. Once infectious disease notification began to reveal the whereabouts of scores of diseased bodies that had hitherto remained beyond the reach (if not gaze) of public health, many local authorities began to exercise their powers of removal, and isolation hospitals became massive-scale, year-round repositories of biological risk. For example, the first four years of notification in Birmingham, 1890–93, witnessed as many scarlet fever hospital admissions (6,220) as there had been in the previous fifteen (6,236). Between 1890 and 1910, the percentage of notified scarlet fever cases admitted to hospital in Birmingham fell below 80 percent on only one occasion.⁵⁷ In the first full year of infectious disease notification in Salford in 1883, 26 percent of all scarlet fever cases were hospitalized. Within three years, this proportion had risen to almost 50 percent.⁵⁸ Curiously, given that thousands of people were admitted to isolation hospitals every year, relatively little is known about what went on in these hospitals, certainly compared to general voluntary hospitals, other specialist hospitals, and workhouses (though one could say that Poor Law medical wards are another historical blind spot).⁵⁹

Chapter 3 sets out how institutionalization of infected patients became routinized, the diseases that were targeted, and the identity of the populations most liable to be sequestered. The extent of hospital isolation varied across England, but from the early 1870s hundreds of thousands of young children suffering from scarlet fever, diphtheria, enteric fever, and smallpox were isolated for weeks on end. Isolation was very much a test case for liberalism because its focus predominantly was on children whose citizenship status was ambiguous. It had political valence through its association with coercive removal, the role of infection rituals for patients and staff within the hospital, and the tight regulation of visiting.⁶⁰ Coexisting with these indications of anxiety was the opportunity to inculcate norms of infection avoidance in patients and their families. These processes gave form and identity to isolation hospitals.

Notification recalibrated the power of the state to interfere with everyday life, but by no means did its long arm reach across the full landscape of disease.

Highly infectious and sometimes fatal common ailments such as measles and whooping cough were not included on the schedule of compulsorily notifiable diseases. Therefore, schools played a crucial role in the control of what came to be known as “nonnotifiable diseases.” Elementary public education from the 1870s meant that schools were used as an important source of information about the existence of infectious disease in the community. Schools were reconceptualized as spaces of extreme biological risk. Education was only one purpose for the space of the classroom: schools were also used as quasi-public health laboratories, in which attempts were made to plot the progress of an epidemic among pupils in the same class, between classrooms, and between the school and home. Chapter 4 juxtaposes initial scientific uncertainties about modes of disease transmission and herd immunity with a somewhat less ambiguous set of normative assumptions regarding the social relational behaviors of pupils and their siblings in the classroom, in school, on the street, and at home. I argue that the micro-mapping of student infections created room for a debate about policies that balanced the demands of political and social efficiency, community protection, and science. The expansion of mass education on the one hand, and the refinement of the spatio-epidemiological technique of contact tracing on the other, offered the state another route of entry into the domestic sphere, which brought home (figuratively and literally) to parents the duties and responsibilities they were expected to bear in the name of a healthy community.

Notions about the inviolability of domestic space and the protective sheath of domesticity were central to British national identity in the Victorian period. The home was both a canonical and contentious space. Infectious disease surveillance provided not only unparalleled access to the homes of the poor, but also a set of tools to destroy and neutralize the biological threat posed by the intimacy of domestic space. Disinfection cleared domestic space of biological dangers, so understanding how disinfection was transformed over the period offers an important perspective on the meaning of Victorian domesticity and contributes to the recent historiography that challenges its supposed conceptual stability.⁶¹ In chapter 5, I depart from other historians’ explanations about the apparent widespread acceptance of disinfection, which have emphasized the benefits of public education for medical science and the consequent public acceptance of disinfection’s intrusiveness.⁶² Rather, I argue that in order to be widely accepted, the municipal disinfection of homes and material belongings was transformed into a mobile, technologically sophisticated, and less obtrusive practice. I explore the adoption and integration of steam disinfection as a safe and easily managed technology that maximized the obliteration of germs but minimized the ruin of material possessions. House disinfection with chemical spraying became a portable, rapid, and directed intervention capable of destroying germs in the darkest corners of the home. I also analyze in some detail the creation, in Manchester’s public health laboratory, of an experimental room that was designed to replicate the conditions of domestic space. This domestic laboratory, I argue, was a spatial expression of the uncertainty of science and the deeply contingent nature of laboratory research.

Chapter 6 builds on chapter 5 by demonstrating that municipal disinfection capacity was *the* vital criterion that persuaded central government in 1906 to grant Sheffield the power to make the notification of respiratory tuberculosis compulsory. As such, a fresh narrative of tuberculosis reporting is provided. Here, the focus on domestic space as an arena of liberal governmentality intensifies, since the fundamental rationale of tuberculosis notification clearly was the configuration of self-governing individuals. The making of the domiciled tuberculosis patient has been virtually ignored by historians, who have preferred to concentrate on the characteristics of sanatorium treatment. This is remarkable given that more than 90 percent of tuberculosis sufferers never saw the inside of a sanatorium. I argue that medical professionals sought to create the autonomous patient through a therapeutic approach that collapsed the spaces of the sanatorium and the home. Self-help manuals guided domiciled patients in the practices of auto-quantification and appropriate ways of living. Such technologies of the self were complemented by the marketing of commodities to homebound tuberculosis patients—baths, reclining chairs, bed rests, reading stands, heating devices, and so on—in a way that imbued these objects with scientific knowledge about hygienic and moral therapy, and incorporated tubercular patients into the realm of late-Victorian mass consumerism. In all, I call these market-centered activities the “preventive therapy” of the home.

While the (often coercive) management of individual behaviors was seen as the route to controlling epidemics, the social relations of the family were the agency through which self-governance was most effectively realized. As the final section of this introduction discusses, accessing domestic space, and neutralize it not only as a harbor of infection but also as a site of deficient family rearing, became a key endeavor of public health by the turn of the twentieth century.

Public Health, Domestic Space, and the Family

Speaking on the subject of “Domestic Health” to the 1881 meeting of the Sanitary Institute in Brighton, public health activist Alfred Carpenter made the claim that “there is scarcely a house in the kingdom in which excreta are not to some extent retained.” By “excreta” Carpenter meant all forms of seepage from the body. Skeptical that bacteriology would ever deliver a knockout punch to cholera, diphtheria, and other infectious diseases in the way that vaccination seemed to be doing to smallpox, Carpenter argued that the key to prevention lay in

removing from our persons and from our habitations those debris which arise from the act of living. . . . The most civilised and luxurious home is, in some cases, carefully prepared for the cultivation of disease-germs or factors, if they come into our midst: carpets, curtains, and comforts of all kinds retain the *débris* from our skins and our pulmonary membranes; the excreta from our sweat-glands are allowed to settle upon our uncleaned windows, out-of-the-way corners, useless ledges, and so-called architectural or upholstering ornaments.⁶³

There are multiple layers of meaning in this short quote. The first is the stark materialization of infection; Carpenter's language is suffused with the proto-terminology of germ specificity that would not have been acceptable, or even comprehensible, to his audience just a few years earlier. The second relates to how Carpenter represents the sources of risk: skin falling away, emanations of the respiratory system, and the outpourings of the sweat glands were now just as threatening as expulsions from the bowels and the urinary tract (for which, of course, technologies of removal existed). This is not simply the debris of illness, of disease, or of malfunction: *normal life* is dangerous; Carpenter is saying that we are all dangerous. Third, and most crucial, this debris was not necessarily dangerous in and of itself: rather, it was rendered dangerous—*cultivated*, in fact—by the form and content of the modern Victorian home. Indeed, some considered the subdivided middle-class single-family dwelling to be no less of a dirt-laden threat than the much vilified lodging house.⁶⁴

At around the time that I began the research for this book, I picked up a copy of *The Family Story: Blood, Contract and Intimacy, 1830–1960*, published in 1999. I read that, apart from a few exceptions, the “home has never been of direct interest to academics or intellectuals.”⁶⁵ This observation was somewhat misleading; it overlooked, for example, pivotal works by influential thinkers such as Gaston Bachelard and Mary Douglas, not to mention humanistic geographers such as Yi-Fu Tuan, who saw “home” as central to their explanatory worlds.⁶⁶ It is fair to say, however, that the home had escaped *sustained* historical attention because of its seemingly mundane role in everyday life. The blossoming of cross-disciplinary work on domestic space over the past decade or so will have gladdened the authors of *The Family Story*. This research, reflected in the proliferation of new journals, collections of papers, textbooks, readers, and active networks of scholars, has started to take apart what we thought we knew, and what scholars had rarely looked for, in domestic space.⁶⁷

It will become apparent throughout this book that of particular interest to me are questions of how “domestic” is produced as a geographical scale and how the “home” was managed as a site of risk and opportunity, both of which reveal much about the structure and exercise of power through the family.⁶⁸ While these concepts and spaces are, of course, continually under negotiation and dispute, there are good reasons to think that the period after 1780 was transformative.⁶⁹ First, “family” became more associated with the nuclear family, rather than with a household comprising an assortment of family members, servants, borders, or others. Second, the home was increasingly perceived as more private and more feminine than it had been before.⁷⁰ Recognizing that these changes took place is not meant to indicate unqualified support for the existence of separate “public” and “private” spheres, a position laid out by Leonore Davidoff and Catherine Hall in 1987. Rather, it is to understand the need to challenge and reformulate the notion of separate spheres, as many authors have done.⁷¹

Sensitivity to the production of the domestic scale, the site of the home, and the concept of family helps disclose the underlying scope of regulation.⁷² For example, many historians have shown that the “sanitary revolution” of the early

Victorian period was as much about altering the appalling conditions of domestic space as it was concerned with improving the physical urban environment.⁷³ *Intrusive Interventions* follows this idea through to the early twentieth century, demonstrating how infectious disease surveillance governed through the agency of family and through the concept of domesticity—domesticity being that which makes the building a dwelling, the house a home—the responsibility for which primarily fell to women.⁷⁴

The practices signaled by the hospital (isolation of people), the school (contact tracing), and the disinfection chamber (destruction and neutralization of biological threats) involved the production and reproduction of space in ways that both disrupted and reinforced the centrality of the family and domesticity in Victorian culture.⁷⁵ One of the crucial questions for liberal democracies has been how the state relates to the private family in shaping duties, responsibilities, rights, and needs.⁷⁶ Ready access to domestic space retrained the attention of public health officials onto the everyday behavior of families and the child-rearing abilities of parents, for whom, as Siân Pooley notes, “child health was a central concern, and at times an all-consuming priority.”⁷⁷ Along these lines, many studies have examined domestic visiting, the infant welfare movement, child protection, and school welfare. What I try to show—particularly in chapters 5 and 6 when discussing disinfection and tuberculosis preventive therapy—is how the national and local state came to share the regulatory site of the home with alternate, but complementary, bureaucracies of power. Some experts outside formal government were armed with medical knowledge and hygienic ideas; others deployed marketing strategies, advertising skills, and the language of selling.

It is important not to lose sight of nineteenth-century gender roles here. There are obvious striations between and within class lines, and according to local cultural, economic, and social conditions, but it is fair to say that for the majority of working-class nuclear families, houses—or just as likely rooms within houses—were made into homes by women, as wives and mothers; family life and parenting responsibilities centered on the woman, even if she was engaged in paid work (which in many cases was home based, as with child-care, lodging, sewing, or laundry).⁷⁸ A little of the same could be said of the middle classes that dominated professional life and shaped many of the public health practices that appear in this book. The middle classes were highly attuned to the role that family played in maintaining respectability and building moral character.⁷⁹ There were, of course, important changes to these prevalent family forms, the situation of men vis-à-vis the home and domesticity, ways of parenting, and what “family” actually meant. *Intrusive Interventions* suggests that infectious disease surveillance assumed a role in these changes that was perhaps less obvious than, say, the infant welfare movement and domestic visiting, but no less powerful. Forced hospitalization, the cleansing of homes and property, and tracing the microgeographies of children within and between schools and homes are as good examples as any of how the state sought to govern through the family and domestic space.⁸⁰