



The pox in Boswell's London: an estimate of the extent of syphilis infection in the metropolis in the 1770s[†]

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This article provides for the first time a robust quantitative estimate of the amount of syphilis infection in the population of London in the later eighteenth century. A measure of the cumulative incidence of having ever been treated for the pox by the age of 35 is constructed, providing an indicator of over 20 per cent syphilitic infection. The principal primary sources are hospital admissions registers, augmented with an analysis of London's workhouse infirmaries. A range of potentially confounding factors are taken into account, including the contemporary conflation between syphilis and other sexually transmitted infections, patients who shunned hospitals in favour of private treatment, possible double-counting of patients, institutional patients who may have hailed from outside London, and the complexity of establishing what should constitute the 'at-risk' population of London for this period. Cultural and medical historians have demonstrated considerable pre-occupation with venereal disease in the texts of the eighteenth century, while demographic and epidemiological historians, lacking any quantitative evidence, have tended to ignore the disease. This article can now demonstrate for the first time just how extensive syphilis was likely to have been and, by doing so, offer an original contribution to major debates in the history of sexuality and the demography of early modern London.

James Boswell (1740–95), the celebrated biographer of Samuel Johnson, was a Scotsman who left a candid record of his sexual exploits on many trips to London while working as a lawyer from 1760 until he settled in the capital with his family in 1786. His diary, which records up to 19 episodes of venereal disease, most contracted through commercial sex transactions, rather than from adulterous or extra-marital liaisons, suggests there was a considerable amount of venereal disease (VD) circulating in the late Georgian metropolis.¹ Trumbach, after reviewing the partial evidence available to him, including VD in military records and in court

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¹ See Turnbull, 'Introduction'. Reported symptoms were consistent with gonorrhoea (or, indeed, chlamydia), which was known to contemporaries as 'the clap', rather than syphilis ('the pox' in contemporary parlance). Ober, *Boswell's clap*, ch. 1. For the most recent exploration highlighting the widespread resonances of the pox in eighteenth-century British literary culture, see Gallagher, *Itch, clap, pox*.

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records concerning divorce, concluded that sexually transmitted infections (STIs) were probably rampant in eighteenth-century London, arguing that during this century ‘the majority of men who lived in cities would at some point contract at least gonorrhoea’.² It has, for instance, long been known that a specialist hospital for the pox, the Lock Hospital, opened its doors at mid-century in 1748.³ This long-standing impression, gleaned from literary and other sources, was given a rather more detailed and systematic treatment with the publication in 2004 of Siena’s study of institutional medical care for VD in London across the period 1600–1800.⁴

However, there has never been an attempt to utilize the surviving primary sources to produce a robust quantitative estimate of the likely prevalence of STIs across the whole population in Boswell’s London. Indeed, STIs have been completely missing from our most sophisticated studies of the demography of both London and England and Wales throughout the entire period from *c.* 1540 to 1914.⁵ Yet, in addition to their significance to the history of sexuality, medicine, and gender relations, STIs are important for demography and therefore for social and economic history. Given the capacity of STIs to affect not only fertility but also morbidity and mortality, this is an unfortunate and potentially important lacuna in our demographic knowledge. However, it is only if robust, comparative, quantitative estimates can be produced that demographic and economic historians can be expected to engage with this issue. The present article complements three other pioneering studies, which have each constructed comparable measures to produce estimates of the quantitative impact of STIs in the population of England and Wales and in Chester in the period *c.* 1770 to 1914.⁶

Of course, both common and medical understandings of STIs in the late eighteenth century were entirely different from that which we have today. The aim here is not to quantify directly all STIs, but to provide a measure of frequency of treatment sought for one disease, known to contemporaries as ‘the pox’; and identified since 1905, when it was first observed under a microscope, as due to infection with the spirochaete *Treponema pallidum*. Today we call it syphilis.

This claim requires qualification. Medical historians have wisely been cautious about diagnosing diseases retroactively due to the difficulties involved in applying modern biomedical categories to periods that precede germ theory. Syphilis has been central to these debates, in part because it was long conflated with gonorrhoea.⁷ Thus, say many, it would be anachronistic to assume every case of ‘the pox’ was syphilis. Indeed, one of the current authors worked extensively in this vein, treating the ‘foul disease’ as an eighteenth-century cultural artefact rather than as modern syphilis. However, the scope of care for the pox that he unearthed in

² Trumbach, *Sex and the gender revolution*, pp. 198–201. Intriguingly this echoed the eye-catching claim made in 1913 by Christabel Pankhurst that ‘75 per cent to 80 per cent of men have before marriage been infected with one form of venereal disease’; Pankhurst, *Great scourge*, p. 10.

³ Andrew, ‘Two medical charities’; Merians, ‘London Lock Hospital’; Innes Williams, *London Lock*.

⁴ Siena, *Venereal disease*.

⁵ Wrigley and Schofield, *Population history*; Wrigley, Davies, Oeppen, and Schofield, *English population history*; Woods, *Demography*; Laslett, *Family life*; Landers, *Death and the metropolis*; Dobson, *Contours of death*. Laslett did very briefly discuss venereal disease in the bastardy volume he co-edited in 1980 and Smout offered a slightly longer discussion on Scotland in the same volume; Laslett, ‘Bastardy prone sub-society’, p. 221, n. 6; Smout, ‘Aspects of sexual behaviour’, pp. 194–7. For the period 1850–1914, McKeown presented no analysis in *Modern rise of population*, pp. 60–3. Syphilis is not addressed in Hardy’s *Epidemic streets*.

⁶ Szreter, ‘Prevalence of syphilis’; idem, ‘Treatment rates’; Szreter and Schürer, ‘Revealing the hidden affliction’.

⁷ Arrizabalaga, Henderson, and French, *Great pox*, pp. 1–19.

Stuart and Georgian London was so vast that he cautioned scholars to keep alive to the likelihood that *treponema pallidum* may have had a lot to do with it'.⁸ The osteological record is also helpful in this regard. An excavation of a seventeenth-century cemetery at St Thomas's Hospital (an institution studied below) revealed that 13 per cent of skeletons showed evidence of treponemal lesions. When we consider that such lesions are only present in a small minority of syphilitic cases, this offers powerful evidence that the hospital was already treating large numbers of syphilitics—not just 'foul patients' but actual syphilitics—a century before the period we study.⁹ We now believe that we have hit upon methods (described below) that can identify the most likely cases of syphilis—at the population level, not the individual level—and which can thus enable cautious estimates about just how common syphilis may have been.

The evidence to be presented below suggests that it was extremely common in Boswell's London. In the conditions of infection prevailing in the capital city in the mid-1770s an individual—of either sex—who lived in the metropolis throughout the age range 15–34 years (and many individuals passed part of that period of their lives in the capital, though rather fewer spent the whole of those years there) would have had above a 20 per cent chance of having submitted themselves to the arduous of residential treatment for the pox. This is a level of incidence well over twice as high as has been found in the city of Chester during the same decade. It carries significant implications for our understanding of the demography as well as the sexual mores and culture of this dynamic, global trading city at the point when it was becoming the largest metropolis in the world.

Most Georgians believed that 'the clap' and 'the pox' represented milder and more severe manifestations of a single 'venereal distemper'.¹⁰ On experiencing initial signs of discomfort, such as a rash or pain in urination, most hoped it was just 'the clap' and would have begun by self-medicating for many weeks with various pills and potions—there was certainly a large market for these.¹¹ However, a substantial proportion would find that this failed to alleviate symptoms, which worsened, because the delayed secondary stage of syphilitic infection, when it arrives, typically produces debilitating pain and fevers lasting weeks and even months, which could not be ignored. Although they cursed their luck for getting the pox, most contemporaries believed that there was available to them a reliable, permanent cure. This was to submit to the rigours of mercury salivation treatment.¹² As Siena has shown, despite its costs this treatment was not only

⁸ Siena, *Venereal disease*, pp. 15–16, 265.

⁹ Only 15–30% of cases of untreated syphilis progress to the tertiary stage, and skeletal involvement only occurs in 10–20% of these cases; Zuckerman, 'More harm than healing?', pp. 44, 48.

¹⁰ Flegel, 'Changing concepts', pp. 576–84.

¹¹ Porter, *Health for sale*, p. 153; idem, 'Lay medical knowledge'.

¹² On the contemporary confidence of doctors and the public in the mercury cure for the pox, see Szreter, 'Treatment rates', p. 188. Of course, such confidence strikes us today as curious since subsequent science has disproved the claim. However, the belief was not irrational. First, it made sense that to cure the consequences of a moral transgression entailed pain and discomfort. Second, since the mercury cure was typically administered for five to seven weeks, given that patients often came forward reluctantly after they had been suffering the symptoms of the secondary stages for some weeks or months, there tended to be a frequent co-incidence between the timing of the treatment and the spontaneous remission of the symptoms, which typically pass after two to three months of discomfort.

available to the more prosperous but was provided in London's largest hospitals, at least two specialist hospitals, and many poor law infirmaries.¹³

Unlike syphilis, the symptoms of gonorrhoea and chlamydia are typically localized and indeed both ailments are frequently asymptomatic.¹⁴ Importantly, because Siena has demonstrated that eighteenth-century patients in London foul wards often battled their diseases for up to six months or even a year before seeking hospitalization, the group appearing in hospitals is likely to be dominated by those suffering significant protracted symptoms more characteristic of debilitating secondary syphilis than of gonorrhoea, soft chancre, or chlamydia.¹⁵ Thus, if there is sufficient evidence to establish an accurate estimate of the number of individuals offering themselves for residential salivation cure in the capital city, this is likely to provide the basis for a robust minimum estimate of the prevalence of the pox in London at this time, if that number can be related to an appropriate figure for the size of the population at risk.

The specific measure that will be constructed here is an estimate of the cumulative incidence (or the probability) in mid-1770s London of having ever been infected with syphilis by the age of 35. Elsewhere, Szreter has provided such an estimate for both the city of Chester and its rural hinterland in the mid-1770s, using a sample of hospital admissions registers similar to those used here.¹⁶ In the case of Chester this was allied to a contemporary census of the population at risk, which included age and sex details. We will return to these results to assist us with calculating a comparable measure for London towards the end of this article, after first constructing for London the two initial figures that we need as the basis for that calculation. These are, first, an estimate of the numerator—the numbers afflicted with the disease; and second, an appropriate denominator—the population at risk in the capital in the mid-1770s.

II. How many were treated for the pox in London?

Siena has shown that by the 1770s venereal patients were being treated *en masse* institutionally as inpatients in sex-segregated foul wards in three categories of institution: first, in London's three largest hospitals, St Bartholomew's, St Thomas's, and Guy's; second, in the infirmaries of a number of its workhouses;¹⁷ and third, in two subscription hospitals, the Lock Hospital, and the short-lived Misericordia Hospital, which also provided free care from 1774 to 1783.

Of particular value are a range of surviving admissions registers from the late 1760s through to the 1780s for two of the three major hospitals which

¹³ Siena, *Venereal disease, passim*.

¹⁴ Among women with gonorrhoea about 70% are asymptomatic, among men 55%; McFalls and McFalls, *Disease and fertility*, pp. 262–4.

¹⁵ Siena, *Venereal disease*, p. 236. On the evidence that chlamydia, though entirely unknown, was a common affliction at this time in a place like London, see Szreter, 'Introduction', in Szreter, ed, *Hidden affliction*, pp. 23–4; and Clarke and Taylor, 'Long-standing evolutionary history'.

¹⁶ Szreter, 'Treatment rates'.

¹⁷ Siena, *Venereal disease*, chs. 2, 3, and 4, demonstrated that while the capital's expanding hospitals tended to cater disproportionately for male patients, workhouse infirmaries treated a balancing preponderance of female patients. Overall, 93 male patients were treated for every 100 female patients in all institutions combined. Given the somewhat greater preponderance of females in the capital's population (see n. 96), this in fact represents a slight disproportion in favour of male treatment.

consistently housed 20–30 per cent of their patients in the ‘foul’ wards, reserved for residential treatment for the pox—already evidence that this was a major problem in the city. London hospitals also treated outpatients for a range of conditions, including venereal complaints. Following the same principles Szreter adopted when he analysed the Chester Infirmary data, all outpatients are excluded from the calculations here, as they were not likely to have been considered as suffering from ‘the pox’. By discounting also those additional ambulatory patients using London’s many dispensaries, we are excluding a very significant absolute number of patients presenting with a range of ‘venereal’ conditions, which were probably not pox.¹⁸

St Thomas’s has excellent, surviving detailed admissions registers. During the period 1773–6, a total of 40 individual weeks’ data has been preserved (that is, about 30 per cent of the total duration of this period).¹⁹ This shows 684 venereal patients were admitted to the foul wards, an average of 17.1 per week, equating to 889 infected individuals treated per annum.

There are no comparable surviving admissions registers for St Bartholomew’s Hospital, though we know that it was of a broadly similar scale to St Thomas’s and that it also had a policy of treating venereal inpatients in segregated foul wards. Fortunately, there is one detailed account from the hospital and prison reformer John Howard who inspected St Bartholomew’s on 19 September 1788.²⁰ He noted 428 patients in the hospital and that there were six foul wards (four for men, two for women) of approximately 15 beds each. So, there were about 90 bed spaces. Given that patients were treated in the foul wards for an average of 42 days, Howard’s testimony implies that St Bartholomew’s was treating approximately 704 patients per year in 1788.²¹

In the case of the more recently founded and slightly smaller Guy’s Hospital, research on two sample whole years of surviving admissions registers indicates a relatively stable pattern across the 1770s, with Guy’s treating about 415 patients per annum during the 1770s.²²

With regard to the second category of institution, a surviving pamphlet for Jonas Hanway’s short-lived Misericordia Hospital cites the treatment of 1,465 venereal patients during the five years 1774–9, of which 335 (22.9 per cent) were inpatients, equating to 67 per annum.²³ These helpfully precise figures again confirm that the numbers of institutionalized inpatients analysed in this article represent only a minority of those seeking relief from venereal conditions.

¹⁸ Both St Thomas’s and St Bartholomew’s typically treated as many, and often many more outpatients than inpatients. For example, in 1775 St Thomas’s treated 3,087 patients in the house and 4,091 as outpatients; while St Bartholomew’s ‘cured’ 4,182 inpatients, as against 4,178 outpatients; City of London, *True Report*. Several dispensaries operated in London by the 1770s and at least one (Westminster) offered treatments for venereal conditions; *Observations*, p. 75.

¹⁹ London Metropolitan Archives (hereafter LMA), St Thomas’s Hospital Admission Registers, H1/ST/B3/1/1, H1/ST/B3/1/2, and H1/ST/B3/2. Only data for whole weeks, typically occurring in runs of several months at a time, were used for the analysis. The missing material during these three years is due to random damage to the surviving documents, so there is no reason to suggest any selective bias in the information available.

²⁰ Howard, *Principal lazarettos*, p. 132.

²¹ With an average treatment duration of 42 days (see below), Howard’s spot observation of 90 bed spaces implies 782 treated per year, reduced to 704 to allow for 90% bed occupancy rate, as at St Thomas’s. Siena found 68 beds initially in St Bartholomew’s foul wards in 1760, but already capacity had been increased by 1762 towards the total of 90 Howard observed in the 1780s; Siena, *Venereal disease*, pp. 101, 105, 109.

²² LMA, Guy’s Hospital Admission and Discharge Registers, H9/GY/B4/1, H9/GY/B4/4, and H9/GY/B4/6. This is the average of the two figures of 402 and 428 for the two sample years studied, 1770 and 1780.

²³ Hanway, *Account of the Misericordia Hospital*, p. 81.

The Lock Hospital's annual reports show that it was treating an average of 478 venereal inpatients per year during the 1770s.²⁴ The Lock concentrated on treating for free the itinerant poor who lacked a 'settlement' entitlement to the poor relief provided by workhouse infirmaries and could not pay privately for treatment.²⁵

Third, there were the workhouse infirmaries. A 1777 parliamentary report found 59 workhouses in London (three of which were run jointly by two parishes).²⁶ Although there were 155 parishes in London (at the 1801 census), 93 per cent of this population resided in the 62 more populous parishes, which were served by these workhouses. The 59 workhouses provided a total of just over 14,000 beds for the capital's indigent poor.²⁷ A substantial proportion of workhouse inmates were sick: by the 1770s up to one-half were categorized as 'infirm'.²⁸ There is archival evidence for care being provided to venereal patients in at least a dozen of the larger workhouses at various points in the eighteenth century.²⁹

An initial gauge of the extent of workhouses' medical provision for poxed patients can be evaluated statistically, despite the absence of surviving admissions records for many of these institutions, by examining the surviving admissions registers of St Thomas's and Guy's. This enables us to see which parishes sent paupers to their venereal wards throughout the period 1773–89.³⁰ One would expect, *ceteris paribus*, to see the largest numbers of such patients appearing in the hospital registers from the most populous parishes. If that is not the case, it indicates that such large parishes must have been treating venereal paupers in their own workhouse infirmaries, a point already suggested for one large parish by Boulton and Schwarz.³¹

²⁴ Compiled from the yearly figures reported at the Annual Court of Governors' meetings 1770–9. Royal College of Surgeons Library and Archive, London Lock Hospital, General Court of Governors Minutes, book 2 (1762–73) and book 3 (1773–90).

²⁵ Siena, *Venereal disease*, p. 232.

²⁶ House of Lords, *Abstracts of the Returns* (P.P. 1776–7, IX). The three pairs were: St Andrew Holborn and St George the Martyr; St Giles-in-the-Fields and St George Bloomsbury; St Margaret's Westminster and St John the Evangelist Westminster. The case of St Andrew Holborn—an important example for this study—is even more complicated. The parish could be viewed in the 1770s as a single one, but in two distinct parts: that within the county of Middlesex was known as 'Above the Bars' and that within the City of London was known as 'Below the Bars'. To further complicate matters, St Andrew 'Above the Bars' was joined with the formerly distinct parish of St George the Martyr in 1767, with which it ran a workhouse with 350 beds. St Andrew 'Below the Bars' was listed as a separate municipal entity both in the 1777 parliamentary report and the 1801 census, and it had a workhouse of its own with 120 beds. The 1801 census shows the parish of St Andrew Holborn (that is, 'Above the Bars') with 15,932 inhabitants and St George the Martyr with 6,273, both in the Holborn Hundred of Middlesex; and additionally the parish of St Andrew Holborn (that is, 'Below the Bars') listed within the Division of Middlesex titled 'City of London, Without the Walls', with a population of 5,511. House of Commons, *Abstract of the Answers* (P.P. 1801, VI).

²⁷ In this article we use the term 'bed' when discussing hospital and workhouse capacity as a shorthand to refer to the number of spaces in these institutions. We understand that eighteenth-century institutions frequently used double beds. All the figures in this article refer to the numbers of actual patients recorded in these institutions.

²⁸ The responses from churchwardens to an enquiry in the early 1770s by Thomas Gilbert reported this for 17 London workhouses: cited in Boulton, Davenport, and Schwarz, "'Ante-chambers of the grave'?", p. 64. See also Siena, *Venereal disease*, pp. 137–44.

²⁹ Siena, *Venereal disease*, pp. 135–80. For St Marylebone, see *Bye laws, rules, orders and constitutions*, p. 8. For the workhouse jointly serving St Andrew and St George the Martyr, see *Rules, orders and regulations*, p. 38. Trial testimony identifies segregated venereal wards in the workhouse in St Leonard's Shoreditch, while parochial records demonstrate similar wards in the workhouse serving St Clement Danes. See Old Bailey Sessions—Sessions Papers, Justices Working Documents, 7 March 1774, www.Londonlives.org, reference # LMOBPS450220173; and St Clement Danes, Minute Books of Parish Vestry Sub-Committees, 11 June 1799, www.LondonLives.org, reference # WCCDMO361050038.

³⁰ LMA, St Thomas's Hospital Admissions Registers, H1/ST/B3/1/1-8.

³¹ Boulton and Schwarz, 'Medicalization of a parish workhouse', pp. 126–33.

Table 1. *155 London parishes (as defined at 1801 census): rates of usage of St Thomas's foul wards during the period 1773–89, and Guy's foul wards during the years 1770 and 1780*

	Population total	No. of patients sent		Ratio: patients per head of population	
		St Thomas's	Guy's	St Thomas's	Guy's
110 small parishes, <4,000 inhabitants	86,527	57	26	1: 1,518	1: 3,328
29 medium-sized parishes, >4,000<20,000	297,939	94	44	1: 3,170	1: 6,771
16 large parishes, >20,000 inhabitants	480,379	41	48	1: 11,717	1: 10,008
14 largest parishes, excl. St Mary's Lambeth and St George the Martyr Southwark	430,101	7	3	1: 61,443	1: 143,367

Sources: LMA, H1/ST/B3/1–8, St Thomas's Hospital Admissions Registers, 1773–89 (surviving registers cover 207 weeks of data spread across these 17 years); LMA, Guy's Hospital Admission and Discharge Registers, H9/GY/B4/4 and H9/GY/B4/6, 1770, 1780 (two complete years).

To evaluate this, table 1 shows all 155 parishes of London split into three groups according to size of the parish at the 1801 census (Wrigley's recent detailed estimates indicate that all these London parishes would have been about 24 per cent smaller in size *c.* 1776).³² This enables data for all the scores of smaller parishes to be used in a meaningful comparative analysis, despite their small numbers. The 110 smallest parishes, each with fewer than 4,000 inhabitants at the 1801 census (that is, fewer than 3,000 *c.* 1776), comprise a total population in 1801 of 86,527. They sent a total of 57 patients to St Thomas's, equating to one patient per 1,518 inhabitants. The 29 medium-sized parishes, those with over 4,000 but fewer than 20,000 inhabitants (that is, fewer than 15,000 *c.* 1776), holding a population of 297,939 in 1801, produced 94 patients, but this only equates to one patient per 3,170 inhabitants. Medium-sized parishes were therefore less than half as likely as the smaller parishes to send patients to the hospital's foul wards, suggesting provision for treatment among some of them.

A similar but much greater effect is apparent for the 16 largest parishes with a population of over 20,000 each (that is, over 15,000 *c.* 1776). They had a total of 480,379 inhabitants in 1801, just over half the London total, but they sent just 41 patients between them, which is one patient per 11,717 inhabitants. So, the largest parishes, mostly equipped in 1777 with the largest workhouses (11 had workhouses of 300 or more beds), sent by far the least patients per head of population.³³

There were two clear anomalies among this group of the 16 largest parishes. St Mary's Lambeth and St George the Martyr Southwark sent, respectively, 26 and 8 of the 41 patients from this category of largest parishes. This may have been in part

³² Wrigley, *Early English censuses*, tab. A2.7.

³³ The two exceptions here were, first, St Pancras, which had an unusually small workhouse of just 120 beds serving the fifth-largest parish population in London (31,779 in 1801); but it still sent very few venereal patients to St Thomas's or Guy's from such a large population (just two patients to each). Second, St Dunstan Stepney operated a workhouse of just 150 beds despite a large population of 25,260 in 1801. It sent no venereal patients to either of the hospitals. For definite evidence of a workhouse of only 120 beds providing some treatment for foul patients, see the evidence on St Luke's Chelsea below at n. 43.

due to their location on the south bank of the Thames and therefore very close to both Guy's and St Thomas's. They had only moderate-sized workhouses for such populous parishes (270 and 220 beds, respectively) and this may also perhaps reflect a long-established pattern of greater general reliance on the two nearby hospitals for treating their ill paupers than other parishes of such size. With these two anomalies removed, the remaining 14 largest parishes sent only seven patients between them, equating to one patient per 61,443 inhabitants. This equates to about 40 times fewer per head of population than the 110 smallest parishes and 20 times fewer than the medium-sized ones. In fact, 10 of the largest parishes sent no patients at all.

When the same analysis is performed on the Guy's registers, the pattern of results is very similar, as can be seen from the other information in table 1 (including the anomalous record of St Mary's Lambeth and St George the Martyr Southwark, which accounted for 23 of the 26 patients sent by the largest parishes to Guy's). There is good reason to suppose that patterns of usage in the missing St Bartholomew's registers would not have departed from those shown here for the other two hospitals.³⁴

Thus, though direct evidence is only available in some cases, it is a safe inference to conclude that in London in the 1770s all but two of the 16 largest parishes had workhouses with infirmaries that regularly treated virtually all venereal cases—to such an extent that their parishes sent a negligible number of poxed paupers to hospital. We want to provide an estimate of the most probable number of venereal patients treated in workhouse infirmaries in the mid-1770s that is both consistent with the available evidence but also highly conservative. Therefore we count only the workhouse infirmaries serving these 14 of the 16 largest parishes, where we have positive evidence from the two hospital registries that they sent either no foul patients at all or virtually no foul patients to either Guy's or St Thomas's Hospital. We will exclude all other workhouse infirmaries, despite the fact that a few had relatively large workhouses (notably, St Saviour Southwark with 600 beds serving a population of 15,596 in 1801) and that the hospitalization patterns of medium-sized parishes suggest some level of provision there, too.

The next important question is: what proportion of the known bed capacity surveyed in 1777 of these 14 workhouses was devoted to its infirmaries—and specifically to treating 'foul' patients? The relevant surviving direct evidence with which to form an estimate is partial, relating to two workhouses in the latter part of the century and two in the early-to-mid century.

The most detailed item of evidence about the extent of treatment offered by any single workhouse infirmary relates to the large workhouse which jointly served St George the Martyr (Queen Square, Holborn) and the part of the parish of St Andrew Holborn 'above the bars'. A full account of its various wards was

³⁴ To seriously invalidate the calculations presented below, it would have to have been the case that some parishes operating large workhouses sent quite large numbers of foul patients to St Bartholomew's even though they sent none at all to either St Thomas's or Guy's. This is implausible for two reasons. First, Guy's and St Thomas's registers give many examples of individual parishes sending poxed patients to both hospitals, as also illustrated below in the discussion of St Luke's Chelsea, preceding n. 43. Second, this pattern of multiple usage also makes sense geographically. Given the location of the three bridges across the Thames, most of London's parishes were roughly equal walking distance from either St Bartholomew's, located just north of the old city walls, or St Thomas's and Guy's, co-located at the southern end of London Bridge. Additionally, the low-cost water-taxis also equalized travel distances and times to all three hospitals.

published in 1791. Wards for sick and infirm inmates accounted for 42.5 per cent of all beds. There were two wards for 'Foul Women' with 16 beds and one mixed ward for 'Sick and Foul Men' with eight beds.³⁵ Allowing for the usual proportion found by Siena of three female venereal patients treated per one male in workhouses,³⁶ this would indicate that in 1791 in this workhouse fully 7.1 per cent of its total capacity (21.33 of its 299 beds) was devoted to venereal patients.³⁷ Second, there is somewhat more indirect, but exactly contemporary evidence from 1774 relating to the workhouse in the parish of St Leonard's Shoreditch, indicating that at this 250-bed institution 2.1 per cent of its beds were allocated to venereal patients.³⁸

Earlier in the century, there is evidence that the combined workhouse of St Giles-in-the-Fields/St George Bloomsbury was designed with separate wards for 'the Foul Disease' in 1726, initially devoting 24 per cent of its nearly 200 bed spaces to its infirmary and over a quarter of these (6.9 per cent of the total) to foul wards. By 1777 it had expanded to a capacity of 520. Although we lack direct evidence on exactly what proportion of beds were in the foul wards, it is certain that it was still making substantial provision for venereal patients.³⁹ The fourth item of direct evidence relates to St Margaret's Westminster. Here we can estimate from contemporary documentation that probably 42.5 per cent of its overall 420-bed capacity in 1777 was devoted to its infirmary.⁴⁰ However, we have to rely on earlier information for an estimate of the proportion devoted to venereal cases. For the two years of 1733–4, the surgeon's reports show that 8.3 per cent of infirmary patients were poxed.⁴¹ Putting these two pieces of information together might suggest about 3.5 per cent of its overall bed capacity (8.3×0.425) being used for foul patients in the mid-1770s, but this must be treated rather tentatively as the two pieces of information are 45 years apart.

Other surviving evidence available for large London workhouses corroborates this level of infirmary provision and that venereal patients were treated, but does not give us more specific information on the proportionate provision for foul patients.⁴² One other workhouse infirmary where some detailed evidence has survived is for

³⁵ *Rules, Orders and Regulations*, p. 38.

³⁶ Siena, *Venereal disease*, pp. 161–4.

³⁷ The 1791 report gives the capacity at 299 beds and is likely to be accurate at that date. This workhouse was returned with 350 beds in 1777. Though these figures appear to conflict, it is perfectly possible that for any number of reasons both figures were correct at the two different dates. See n. 26 on this parish's particular complexities.

³⁸ In 1774 the nurse of St Leonard's female foul ward testified—concerning an assault in the ward—that there were four patients present. Since Siena found three females per one male treated in workhouses, this implies an average 5.33 patients of both sexes combined treated at this time in an infirmary of 250 beds, implying a rate of $5.33/250 = 2.13\%$.

³⁹ Siena, *Venereal disease*, pp. 148, 152.

⁴⁰ Insurance policies for 1760, 1774, and 1795 consistently value the workhouse at £700 and the separate infirmary at £400, indicating 36% of the two buildings combined devoted to patient beds. Administrative minutes show 14 of 33 rooms (42.4%) in the infirmary, 13 housing patients; *ibid.*, p. 140. Although there is no extant floor plan, we can be certain that not all of the other 19 rooms could have housed inmates, so it would be safe therefore to estimate that at least 40–45% of the total bed capacity was in the infirmary.

⁴¹ Westminster City Archives Centre, London, St Margaret's Westminster, Workhouse Committee Minutes, 1730–6, E2634, pp. 242–3 and 383–6.

⁴² At St Marylebone, London's largest parish with a massive 600-bed workhouse by 1777, there is direct evidence that about 30% was devoted to infirmary patients and that there were multiple venereal wards extant, but there is no precise information on the latter's size; *Bye Laws, Rules, Orders and Constitutions*, p. 8. When this giant parish (with a population of 63,982 in 1801) opened its grand, new, purpose-built workhouse in 1776, 300 inmates of

St Luke's Chelsea. This served a moderately large parish (11,604 in 1801). Its workhouse had only 120 beds. Its registers have unusually survived and they show an average of just two venereal patients admitted and treated per year throughout the period 1782–99. Of the 34 separate individuals treated, we know that 16 were sent on to a hospital: eight were sent after no more than 10 days while the others stayed at least 28 days in the workhouse before being hospitalized.⁴³ Thus, some venereal paupers received prolonged treatment in this workhouse, others were treated for a month or more before being thought to require hospitalization, and still others were hospitalized right away, probably either because their cases were seen as more serious or because the infirmary lacked a bed when they applied.

So, we have two reasonably contemporary, well-testified observations that 7.1 per cent of beds at St Andrew Holborn were allocated to foul paupers and 2.1 per cent at St Leonard's. We also have two estimates based on observations from earlier in the century, suggesting possible figures of 6.9 per cent at St Giles-in-the Fields and 3.5 per cent at St Margaret's Westminster. To split the difference between the two secure estimates would indicate a figure of 4.6 per cent, while to average all four estimates would result in a figure of 4.4 per cent. However, in order to err on the side of caution and to ensure that the estimates produced in this article are robustly minimal ones, we adopt a value closer to the lower end of these estimates. We believe the evidence presented here justifies the view that at the very least 3.0 per cent of the beds in the workhouses serving London's 14 largest parishes in the 1770s were treating patients for pox in foul wards. An estimate of 3 per cent of all beds (that is, beds for inmates plus infirmary beds) allocated for foul patients would equate to only about 6–12 per cent of the known infirmary capacity in the examples discussed above. This is equivalent to only about one-third the proportionate space allocated to foul wards in hospitals like St Thomas's, where it is known that 20–30 per cent of their inpatients were in the foul wards. Furthermore, our conservative approach excludes all workhouses serving medium-sized parishes, even though we know that in several cases, such as St Leonard's Shoreditch and St Luke's Chelsea, some treatment was definitely being offered.⁴⁴

Of the 14,004 total bed spaces in London workhouses in 1777, as many as 6,152 were to be found in these 14 largest parishes (that is, excluding the 490 beds in St Mary's Lambeth and St George the Martyr Southwark). With our cautious estimate that 3 per cent were devoted to residential treatment of foul patients, that would produce a figure of 185 beds.

the overcrowded old building were transferred into it. The old building, with an originally intended capacity of 120, was promptly designated as the workhouse's infirmary, though it soon had to be replaced in 1791 with a new 300-capacity infirmary block. This indicates that approximately 28–33% of total bed capacity at St Marylebone was devoted to infirmary patients in this period; Neate, *St Marylebone workhouse and institution*, summarized at <http://www.workhouses.org.uk/StMarylebone/> (accessed on 4 Aug. 2017). The similarly very large workhouse of St Mary Whitechapel was identified by a contemporary, George Dyer (*Complaints of the poor people*, p. 64), as offering such a good infirmary (like St Marylebone's it was in a separate building) that 'it supplies the want of an hospital'. Given that all three of London's largest hospitals treated venereal cases—and lots of them—this could be taken strongly to imply foul wards at the Whitechapel workhouse's infirmary, but again no indication of their capacity.

⁴³ LMA, St Luke's Chelsea, Workhouse Admissions and Discharges, 1743–69, 1782–99, microfilm x/15/37.

⁴⁴ Siena, *Venereal disease*, p. 162.

How many patients annually would have been treated in those 185 beds? The average length of treatment for hospitalized foul patients was 42 days.⁴⁵ Therefore, each bed could have catered for 8.69 patients per year if bed occupancy was 100 per cent. All the evidence available indicates very full occupancy rates in various foul wards in this period. There was a regime of waiting lists and discharge and entry on the same day at the main hospitals, with numbers entering determined by bed availability. We also have one invaluable piece of evidence with which to estimate bed occupancy rates in late eighteenth-century foul wards. Howard made one of his inspection visits to St Thomas's Hospital on 17 September 1788. He counted 80 patients in the foul wards (53 men and 27 women). Given that patients were treated in the foul wards for an average of 42 days, Howard's testimony would imply that St Thomas's was treating 695 patients per year in September 1788 if there had been 100 per cent bed occupancy.⁴⁶ However, we also have the admissions registers for St Thomas's during the period 1788–9. These indicate that during an eight-month period at that time, immediately following Howard's visit, 491 patients were in fact admitted, which indicates an actual, achieved annual occupancy rate of 90.4 per cent.⁴⁷ It would thus seem to be a safe, conservative procedure to assume an occupancy rate for these 185 beds in the workhouse infirmaries of no lower than 80 per cent. This equates to 6.95 patients per bed per year. When multiplied by 185 beds, that produces 1,286 venereal patients per year as our final estimate of the minimal number of patients treated annually in the mid-1770s in London's workhouse infirmaries.

We can now add this figure to the numbers that we know for the other hospitals. As table 2 shows, this results in an initial estimate that 3,839 persons were treated annually in the mid-1770s in London's foul wards in all its various institutions combined.

However, these raw figures must now be adjusted for various categories of probable over-counting. First, there is an adjustment to be made if we are going to relate the numbers treated to a restrictive definition of the metropolitan population at risk as the denominator. This requires removal of non-metropolitan patients treated at the three major hospitals (that is, those coming from outside London, using the 1801 census's territorial definition of the city as 155 parishes). Unfortunately, the admissions registers for the London hospitals do not give patients' residential information. However, they do record addresses of patients' sureties (sponsors), namely those who posted the requisite one-guinea bond that indemnified the hospital of burial costs in the case of death. St Thomas's registers show 3.7 per cent of such addresses were non-metropolitan (1773–6). Additionally, the sponsoring parish of pauper patients was listed and its geographical location can be evaluated. This shows that from 1773 to 1789, 12.34 per cent of the 889

⁴⁵ On durations of treatment reported for St Bartholomew's and the Lock, see *ibid.*, pp. 99, 101, n. 7; pp. 246–7. This figure of 42 days is also confirmed by the new calculations reported below.

⁴⁶ With an average treatment duration of 42 days, this implies that Howard's spot observation of 80 patients being treated on the day of his visit should be multiplied by 8.69 to estimate the number treated in 365 days. However, we do know that half of this reduction between the two dates is explicable through a documented conversion in 1781 of one of the two female foul wards into a clean male ward.

⁴⁷ 491 (321 men and 170 women) over eight months is equivalent to 628 patients over 52 weeks. The surviving registers from this period also show a much lower figure of 545.4 per year for the period of 3 Jan. 1788 to 4 Sept. 1788, just before Howard's visit, but this lower figure was affected by the disruption caused by extensive closures of two wards, one for seven weeks and one for 14 weeks.

Table 2. *Adjusted annual total of all inpatients treated for pox in all London institutions, c. 1775, corrected for a London population defined as the 155 parishes at the 1801 census*

A. Hospitals	
St Bartholomew's Hospital	704
St Thomas's Hospital	889
Guy's Hospital	415
Misericordia Hospital	67
Lock Hospital	478
<i>Sub total:</i>	2,553
B. Workhouses	
	1,286
<i>Initial total</i>	3,839
Adjustments:	
Patients from outside 155 parishes	-164
Patients discharged <35 days	-626
Repeat visits	-242
<i>Adjusted final total</i>	2,807

LMA, St Thomas's Hospital Admission Registers, H1/ST/B3/1/1, H1/ST/B3/1/2, and H1/ST/B3/2; LMA, Guy's Hospital Admission and Discharge Registers, H9/GY/B4/4 and H9/GY/B4/6; Howard, *Principal lazarettos*, p. 132; Hanway, *Account of the Misericordia Hospital*, p. 81; Royal College of Surgeons Library and Archive, London Lock Hospital, General Court of Governors Minutes, book 2 (1762-73) and book 3 (1773-90); House of Lords, *Abstracts of the Returns* (P.P. 1776-7, IX).

venereal patients treated per year in St Thomas's were paupers and 41.64 per cent of these (137/329) came from parishes outside London. By contrast at Guy's during the sampled years 1770 and 1780, 17.47 per cent (145/830) were paupers; and of these 17.61 per cent (25/142 verifiable cases) came from outside London.

This evidence therefore indicates that 5.14 per cent (12.34×0.4164) of St Thomas's foul patients were non-metropolitan paupers, while at Guy's the equivalent figure was 3.08 per cent (17.47×0.1761). In each case this should be added to the 3.7 per cent of non-pauper patients estimated as coming from outside London from the information available for sponsors, making a total of 8.84 per cent for St Thomas's and 6.78 per cent for Guy's.⁴⁸ Since St Thomas's was annually processing 2.14 times as many venereal patients as Guy's, the weighted average of these two figures indicates that to allow for the treatment of non-metropolitan patients the total numbers of patients at all three hospitals should be reduced overall by 8.18 per cent. It is not necessary to apply this reduction to the poor law infirmaries, as they treated settled residents. This factor would reduce the estimate for the number of metropolitan patients annually treated at the three hospitals from 2,008 to 1,844, a reduction of 164 patients, with the result shown in the first line of the lower panel of adjustments in table 2.

Second, there is the crucial question of what proportion of all 'venereal' patients treated as inpatients were likely to have been suffering from syphilis ('the pox'), as

⁴⁸ There are no comparable data for bondholders available to make an independent estimate for Guy's and so the St Thomas's estimate has to be used for both institutions; there is no comparable surviving evidence of either kind for St Bartholomew's.

against various other venereal afflictions, notably gonorrhoea ('the clap'). As is well known, contemporaries tended to view the clap and the pox as earlier and later manifestations of a single disease entity. Patients with the former engaged in much self-medication. However, those with more persistent and debilitating symptoms typically believed themselves to be suffering from the more serious distemper of pox and were more likely to present themselves for institutional treatment. This was because it was widely believed that only mercurial salivation could reliably cure the pox. This debilitating course required residential care, usually for at least five weeks.⁴⁹ Thus, it is possible to distinguish by these criteria those hospital patients most likely suffering from syphilis, that is, those believed to be 'poxed'. So, only inpatients with a venereal diagnosis and remaining in hospital for at least 35 consecutive days are counted.

St Thomas's compiled indexes from its admissions and discharge registers and a surviving three-year sample of these (1769–71) can be analysed to calculate the distribution of durations spent in hospital. This analysis confirms in more detail the pattern Szreter found in Chester, that an extremely large proportion of venereal patients (about one-third of each sex) were treated for exactly 35 days, which was the norm for pox treatment.⁵⁰ A distinct minority (under a fifth) were discharged before five weeks, while the great majority underwent treatment for 35–56 days (70.55 per cent of males and 72.26 per cent of females). Among males in the St Thomas's indexes, the average duration was 42 days and the mode was 35 days, while among women the mode was also 35 days and the average duration was 41.3 days.

With 15.85 per cent of females and 17.60 per cent of males discharged in less than 35 days, this indicates that a reduction of approximately 17.04 per cent should be applied globally to all London institutional treatment figures (that is, all institutions in table 2) to allow for non-syphilitic cases admitted into the foul wards.⁵¹ This reduction, comprising 626 patients, is shown in the second line of the lower panel of table 2. These excluded inpatients should be counted alongside the sizeable number of hospital and dispensary outpatients treated for venereal complaints deliberately omitted from our analysis, as diverse groups with venereal conditions that were much less likely to have been syphilis.⁵² The conflation of syphilis with gonorrhoea has presented one of the most vexing problems for scholars working on venereal disease in the period and has long inhibited attempts to conduct studies like this one. However, by charting the duration of hospital stays and excluding those not retained for at least 35 days' treatment, we believe we have hit upon a useful way to untangle at least one part of that knot.

Third, there is the question of double-counting of venereal patients returning for repeat treatments (lasting over five weeks each). Szreter identified only one such case in Chester over a complete three-year run of admissions registers. However, St Thomas's indexes demonstrate that this factor was much more prominent in London and requires a further statistical adjustment. The Indexes record

⁴⁹ On mercury salivation treatment as the dominant practice, including in workhouses, see Siena, *Venereal disease*, pp. 22–5, 60–1, 85–6, 102–3, 245–6.

⁵⁰ Szreter, 'Treatment rates', p. 189.

⁵¹ The calculation is weighted by the greater number of males treated (1,531:1,130) and is as follows: $(15.85 \times 530) + (17.60 \times 1,131) / (530 + 1,131) = [8,400.5 + 19,905.6] / 1,661 = 17.042$.

⁵² See above, at n. 23, for an estimate of some of those excluded that is available for the Misericordia.

1,483 males entering the foul wards for treatment in 1769–71. Scrutiny of names indicates that 5.2 per cent of these entries represent duplicates, with 74 second visits by men already counted and three further cases of third visits. Among the 699 female entrants 8 per cent are duplicates (with one woman appearing for a fourth visit).⁵³

However, these figures of 5.2 per cent and 8 per cent are significant underestimates of the true extent of repeat-visiting, for which these sources provide testimony. This is because we can only follow a small proportion of these patients for three full years: namely, those admitted very early in 1769. It is highly unlikely to see returning for a second treatment those patients first admitted during the last three to six months of 1771. However, the data afford the opportunity to model this effect with reasonable accuracy, as reported in online appendix S1. The relevant calculations in online appendix S1 indicate that the estimate of the total number of individual patients treated should be reduced by a further 7.935 per cent to allow for this evidence-based estimate of repeat visits by the same patient.

There seems no good reason to suppose that this phenomenon should not also have applied to those treated in workhouse infirmaries and other hospitals in the capital, and so the appropriate reduction is shown as the third line of adjustments in table 2, where it is applied to the entire institutional total of patients in all institutions, reducing the total by a further 242 patients.

As table 2 shows, application of all these correction factors results in an adjusted final estimate of 2,807 inpatients treated for pox annually in all London institutions combined in the mid-1770s.

III. Constructing the denominator: two measures of London's population, c. 1776

With a primary estimate for the numerator established, there is now the question of the denominator: the relevant, 'at risk' London population. Our selection of poor law parishes and workhouses uses the near-contemporary definition of London's territorial extent and associated residential population that was published by the first commissioner of the Census of England and Wales in 1801, John Rickman. This also corresponds closely (though not precisely) to Wrigley's recent estimates for the populations of the hundreds, townships, and boroughs of England, 1761–1801, a new series, which enables us to establish the estimated figure for London's population c. 1776.⁵⁴

There are two variants of the London population c. 1776, which we can construct as the denominator. One is a strict population of residents in the 155 parishes, defining the metropolis at the 1801 census. The other would be a somewhat

⁵³ LMA, St Thomas's Hospital, Patient Indexes, H1/ST/B4/1. There was insufficient detail recorded for all patients' durations of treatment to be analysed. The analysis was carried out on 1,131 (76.3%) male and 530 (75.8%) female admission entries.

⁵⁴ Wrigley, *Early English censuses*, pp. 23–4, and ch. 3, explains how the figures for Hundreds, 1761–1801, published in his tab. A2.7, have all been subject to correction for the missing persons which previous analysts had been aware of, such as soldiers and sailors, plus others revealed by modern demographic analysis, such as notably infants and young children. For previous London population estimates, see Schwarz, *London in the age of industrialization*, pp. 125–8; Landers, *Death and the metropolis*, pp. 178–9.

larger figure which would include a penumbra of additional populations closely contiguous with London.

Wrigley's work indicates that *c.* 1776 the first of these two population totals would have been 645,421.⁵⁵ However, it can be argued that this figure drawn from Wrigley's work should be adjusted downwards slightly for a set of 21 parishes which they include but which were not included in the 1801 census definition of London (used in the analysis above, where we excluded 8.2 per cent attending the London hospitals). After this compensating adjustment (detailed in online appendix S2.A), the relevant, gross 'at risk' population falling within the catchment area of the hospitals and workhouses studied here was estimated at 600,887 (equal to 645,421 minus 5.69 per cent).

The second approach, as mentioned, is to seek to construct a somewhat more widely defined London population as corresponding to the bulk of the population served by the institutions studied here, particularly the hospitals, as discussed in detail in online appendix S2.B. This would probably be a somewhat more realistic estimate in recognition of the porosity of the boundaries of the London population, both in terms of daily influxes of its workforce from immediately surrounding locations and in terms of short-term sojourners. Many of the latter were no doubt treated in the Lock Hospital and the Misericordia. It is also possible that some of those treated at the hospitals were technically not resident in London, in addition to those with sureties posted by non-residents; and we also have evidence, as we have seen, that just over 8 per cent of paupers treated in the hospitals were paid for by non-metropolitan parishes.

Online appendix S2.B shows that the larger estimate, incorporating in particular those nearby contiguous settlements south of the river, where two of the three large hospitals offering venereal treatment were located, is a denominator population *c.* 1776 of 677,083. However, to use that population as the denominator, it would be necessary to replace back into the numerator the 164 patients excluded in the first line of the lower panel of table 2. This reduces to an additional 125, after applying the same consecutive reductions of 17.04 per cent and 7.935 per cent as all other patient numbers in table 2, resulting in a 'larger London' numerator of 2,932 (2,807 plus 125).

IV. The probability of treatment for pox by the age of 35 in London and Chester, *c.* 1775

The previous sections have produced a gross figure for the number of separate individuals treated annually for the pox by London's various institutions and an estimate of the total 'at risk' population that accessed those institutions in the mid-1770s for two different definitions of London's populace in the mid-1770s. This permits a simple gross ratio giving the crude annual rate of treatment per capita *c.* 1775. That ratio is the product of either dividing the figure of 2,807 patients treated per annum by 600,877 or the figure of 2,932 patients per annum by 677,083. This tells us that one in 214 metropolitan Londoners (46.7 per 10,000) were treated for pox each year in the 155 parishes; or, alternatively, that the ratio was one in

⁵⁵ Dividing Wrigley's 1771 and 1781 estimates by two. The 1771 figures are 576,223, plus 44,485 (for Southwark); the 1781 figures are 623,359, plus 46,875 (for Southwark).

231 Londoners (42.3 per 10,000), if we take the more extensive estimate of the population using these institutions.

For the city of Chester at exactly the same point in time, the mid-1770s, the crude annual rate of treatment per capita was one in 659 (12.2 per 10,000). The metropolitan London figure is just over three times (3.08 times) higher than the Chester figure, while the 'larger London' figure is 2.85 times higher. In the case of Chester there was also sufficient detailed demographic data available from a pioneering census conducted in 1774 by the eminent local physician, Dr John Haygarth (1740–1827), to compile a life table for the city. This meant that, with the age and sex recorded by Chester Infirmery for each patient treated for the pox (defined, as here, as 'venereal' inpatients treated for at least 35 days), it was possible to produce precise age-specific rates of treatment for each sex in five-year age groups from the age of 15 through to the age of 34. After further adjusting this estimate upwards slightly to allow for the proportion of Chester's population drawn from the genteel classes who would have sought treatment privately, it was possible to produce a single (both sexes combined), robust figure for the cumulative probability of ever having been treated for the pox by the age of 35 among the population of Chester in the mid-1770s. That figure was 8.06 per cent.⁵⁶

This makes it possible, in principle, to convert the crude ratio for London into a comparable cumulative probability rate, as calculated for Chester. This would be a simple matter if we knew that the age, sex, and social structure of the two cities was similar and also that the age and sex of those seeking treatment was the same in London as in Chester. The cumulative probability rate calculated for Chester could then simply be multiplied by the relative difference obtaining between the crude ratios for each of the cities and this would produce a London figure either 3.08 or 2.85 times higher than the Chester figure, depending on which definition of London we used.

However, since those three assumptions about similarity are unlikely to be valid, we therefore need empirically-based assessments of the extent to which each of the relevant characteristics of the London population and of the poxed patients treated in London may have differed from those in Chester to make appropriate adjustments. First, is there evidence for differing proportions of patients treated above the age of 34 in each of the two cities? For Chester we have a full account of ages of patients treated in the Chester Infirmery register. For London we have to rely on several more partial forms of evidence. In Chester we know that 13.4 per cent of the 67 patients treated for the pox in 1773–5 were aged 35 and over, comprising 5.7 per cent of all women treated and 21.9 per cent of all men treated.⁵⁷ The four available items of London evidence show a similar pattern with 5–10 per cent of women over the age of 34 and two to four times that rate of occurrence for men aged over 34.⁵⁸ Given the small numbers involved and the diverse social

⁵⁶ Szreter, 'Treatment rates'.

⁵⁷ *Ibid.*, pp. 190–1 and tab. 2.

⁵⁸ In London Siena's analysis of the ages of female venereal patients treated in the workhouse infirmaries of St Luke's Chelsea, (1742–9 and 1782–99) and St Andrew Holborn (1776–81) found 10% and 4%, respectively, aged over 34. In St Luke's 40% of men treated were over the age of 34 (no ages were given for women); Siena, *Venereal disease*, fig. 10, p. 162. At just under twice the Chester figure of 21.9%, this looks like a substantial difference. However, it has to be borne in mind that the two sets of figures do not apply to similar strata of society. Whereas the Chester figure represents men drawn from all but the most genteel 5–6% of the town's community, the London

provenance of the London samples, this evidence does not indicate a reliable and statistically significant difference in the age-and-sex-pattern of contracting the disease between the two cities and so no additional adjustment will be made on this account.

Second, social structure affects our estimate of the probable proportion of each population likely to have engaged in private rather than institutional treatments. Szreter's estimate for Chester city already includes an empirically based allowance for this factor. He estimated that 5.3 per cent of the city's adult population comprised a more prosperous stratum who would probably have sought private treatment.⁵⁹ However, London at this time would have had a rather larger proportion than Chester of genteel and other individuals who could afford to protect their confidentiality when seeking treatment for the pox.⁶⁰ The question is how much larger? Using Schwarz's research on London's social structure in 1798, we would estimate that about 13.5 per cent of London's population, a proportion almost two-and-a-half times higher than that of Chester's, would have paid for private treatment and therefore not appeared in our institutional sources.⁶¹ This would imply that the cumulative probability estimate derived from Chester's population should be adjusted upwards by 8.2 per cent (13.5 per cent less the 5.3 per cent already included within the Chester figures) to allow for its proportionately larger, genteel stratum who were likely to have used non-institutional sources of treatment. That would probably apply with somewhat less force to the 'larger' London population of 677,083 which incorporates an additional 70,000 inhabitants of the less prosperous penumbra and so an inflation factor of only 6.2 per cent (11.5 per cent less 5.3 per cent) will be used for the greater London estimate.

Third, there is the question of whether and by how much Chester's and London's age structures differed in ways which should be taken into account. It is well known that early modern flows of migration to urban centres tended to produce disproportionate numbers of young adults, the principal group at risk of contracting STIs.⁶²

Szreter was able to produce precise estimates of the proportion of Chester's population in each five-year age group by sex.⁶³ London lacks any similar census enumerations for the 1770s with which to form comparable estimates (and in fact a London census with reliable information on ages had to wait until the 1851 census).⁶⁴ However, Landers has published a carefully considered set of

workhouse figures are drawn from only the most indigent 5–10% of men in the parish of St Luke's. Two other relevant items of London evidence relate to records from the Lock Hospital. One surgeon's casebook from 1798 shows 4.9% of females aged 35 and above (four out of 82 adult women treated); and another from 1813/14 shows 9.5% of males (two out of 19) aged 35 and above; Royal College of Surgeons Library, London, Lock MS 'Mr. Pearson' (1798) and Lock MS 'Drug book & case notes of J. Ritchie' (1813–14).

⁵⁹ Szreter, 'Treatment rates', pp. 202–4.

⁶⁰ For examples of the genteel seeking to protect their reputations, see Siena, "'Foul disease" and privacy'; Weisser, "'Poxt and clapt'", pp. 81–2.

⁶¹ Schwarz, 'Income distribution'. See online app. S3.

⁶² London's characteristic of drawing a powerful net inward flow of young adults throughout the period, c. 1600–1850, has recently been empirically reconfirmed: van Lottum, 'Labour migration'.

⁶³ Szreter, 'Treatment rates', tabs. 6A and 6B, pp. 198–9.

⁶⁴ This shows that 37.39% of the London 1851 population were aged 15–34, with a female preponderance (17.03% males, 20.04% females). Calculated from *1851 Census*, tab. II: 'England and Wales ages of males and females enumerated', pp. cxcii–cxci.

partly empirical and partly life-table-modelled estimates for London's changing age structure (both sexes combined) across the period 1730–1829.⁶⁵ Comparison between Landers's estimates for the period 1770–89 and the figures for Chester in 1774 indicates that the proportion of London's population aged 20–29 was 13.4 per cent greater than that in Chester at that time.⁶⁶ This therefore indicates that the Chester-derived cumulative probability estimate should be deflated by 13.4 per cent to allow for the greater proportion of the London population in the prime age range for contracting a venereal infection, which will have produced higher crude figures of numbers seeking treatment than those found in Chester, but solely due to the larger proportion of London's population in the primary at-risk age range. Since our method relies on using the ratio difference in crude rates between the two cities to derive an estimate of a more refined age-specific measure, this age-generated effect needs to be removed. This 13.4 per cent reduction should be applied before either of the supplementary 8.2 per cent and 6.2 per cent inflation factors, which are to allow for the proportions likely to have used private treatment, living in London, and in or near London, respectively.

So, if the ratios of 3.08 and 2.85 (expressing the extent to which more patients per head of population were treated in either definition of London than in Chester) are each first deflated by 13.4 per cent, this produces ratios of 2.67 and 2.47, respectively. If the first of these two is then inflated by 8.2 per cent and the second by 6.2 per cent, this results in final ratios of 2.89 and 2.62, respectively. Those ratios, in turn, produce estimates that 23.26 per cent or 21.12 per cent of the population had been treated for pox by the age of 35 in lesser and greater London, respectively.⁶⁷

As table 3 shows, in comparative terms these estimates of pox incidence for London are over two-and-a-half times higher than that for Chester in the same decade; and about 25 times higher than that for the rural population in settlements of fewer than 2,500 inhabitants in the region of west Cheshire and north-east Wales surrounding Chester. It is perhaps no surprise that this exercise has confirmed that the sexual culture of the metropolis diverged considerably from that of rural Britain in the late eighteenth century, but it also appears to have been significantly different even from second-rank provincial cities.

⁶⁵ Landers, *Death and the metropolis*, pp. 174–83. We are grateful to Jeremy Boulton for alerting us to these estimates.

⁶⁶ *Ibid.*, tab. 5.8, p. 180, which shows 18.7% aged 20–29 in 1770–89. The comparison can be made with the figures for that age group published in Szreter, 'Treatment rates', tabs. 6A and 6B, which shows 16.49% aged 20–29 (9.29% females and 7.20% males). These percentages for Chester are produced by summing the relevant figures in the 'N(x)' columns for ages 20–29 and dividing the sums for each sex by the total population of 14,713. It is not possible to make the comparison between all those aged 15–34 because Landers's tab. 5.8 only gives figures for 10–19, 20–29, and 30–39; therefore, only the age group 20–29 is strictly comparable and relevant. The 13.4% difference cited in the text is the proportionate amount by which 18.7% is greater than 16.49%.

⁶⁷ An alternative methodology, which is more mathematically elegant but draws on less relevant, known information, would be to estimate the cumulative probability of infection directly by cumulating the annual probability over the assumed number of years 'at risk'. It is also dependent on Landers's (*Death and the metropolis*, tab. 5.8, p. 180) partly conjectural age-structure estimates for the capital in the 1770s, which indicate that the relevant age group formed about 26–28% of the population of the capital. For example, if for the metropolitan London population of 600,877 the gross rate of annual infection is 1/214 and if we can assume this applies to about 27% of the population who are 'at risk', then the annual chance of infection in the whole population is equal to 0.004673 (one in 214) divided by 0.27, which is 0.01731. The consequence of this annual chance of infection accumulating over 15 years will be 0.2304 (23%) of the population infected after 15 years (1 minus [1 minus 0.01731]¹⁵); and it will be 0.2947 (29%) infected after 20 years (1 minus [1 minus 0.01731]²⁰). It is a reassuring check that this estimate, averaging 26%, is in the same region as that of 23.26% shown in tab. 5, produced by the more complex procedures described in the text.

Table 3. *Estimates of percentage rates of treatment for pox by age 35 among men and women in different locations in England and Wales, c. 1775*

<i>Location, c. 1775</i>	<i>Rate of treatment for pox by age 35</i>
Rural Cheshire and north-east Wales	0.93
Chester city	8.06
London 155 parishes (est. population total 600,887)	23.26
'Greater' London (est. population total 677,083)	21.12

Sources: Szreter, 'Treatment', for Chester and Cheshire; the current article for London.

It should be borne in mind, furthermore, that this estimate for the incidence of pox implies a substantially higher overall quantum of STI afflictions in general in London at this time, which would include many of those identified as 'venereal' and treated as outpatients, in dispensaries, or during short hospital stays, whom we have excluded but who may have harboured ailments like gonorrhoea. This also follows from the finding in the early twentieth century that in untreated populations (meaning that the medical treatments available were ineffective, not that people did not seek treatment) the much more infectious disease of gonorrhoea probably affected about four times the number of persons that were afflicted by syphilis.⁶⁸ If this epidemiological ratio between the two STIs also broadly held true in the eighteenth century (and there are no good reasons currently known to believe that it did not), then our current findings would imply that an even greater number of Londoners—potentially much greater—would have contracted gonorrhoea (or, indeed, chlamydia) than contracted syphilis. Given the conservative methodology adopted throughout this article, this suggests a surprisingly high incidence of STIs in the capital city; and it confirms that Boswell's London may well have fully deserved its historical reputation. Although these results and those for Chester would indicate that Trumbach's view that the majority of urban men would have had an STI at some point in their lives was probably an exaggeration if taken as applying to all urban populations in Britain in the 1770s, it may well have been correct for the population of London.

At first sight, such a high incidence might elicit scepticism, just because it is a high figure. If so, it bears reminding that even today some parts of the world witness similar rates of HIV infection. South Africa, for example, currently reports an HIV infection rate among adults of 20 per cent.⁶⁹ It is thus certainly conceivable that in an age before effective treatments or prophylaxis, a fast-growing metropolis like London, with a continuous inflow of young adults often struggling

⁶⁸ Szreter and Schürer, 'Revealing the hidden affliction', p. 380; p. 411, n. 24.

⁶⁹ The United Nations UNAIDS data for 2019 reports that South Africa witnesses infection rates with HIV alone (not counting other STIs) among adults aged 15–49 years (both sexes combined average) of 20.4%; <https://www.unaids.org/en/regionscountries/countries/southafrica> (accessed on 25 May 2020). Note that the comparison with HIV is appropriate in that, rather like syphilis, the chance of transmitting HIV during a single sexual act is very low (unless either partner has exposed skin abrasions) and certainly much lower than either gonorrhoea or chlamydia.

to gain an economic foothold, could witness epidemic STI infection rates on this scale. Nevertheless, because our estimate is so high we must address potential counterarguments likely to be raised. Most importantly, thoughtful readers may challenge the identification of likely syphilitics based on the issues related to retrodiagnosis discussed earlier, as well as syphilis's reputation as notoriously difficult to diagnose. Hailed as the 'Great Imitator', its symptoms can suggest other ailments.

Two points are worth considering here. First, while it is certain that some patients admitted to institutional foul wards would not have harboured syphilis, the mirror phenomenon also surely occurred. Siena showed how commonly the London foul strategized to enter the so-called 'clean wards', both to save face and to pay lower admission fees; and hospitals forever complained that the poxed evaded notice and entered other wards.⁷⁰ Moreover, the same diagnostic difficulties that would have led to 'false positives' in our data (that is, non-syphilitics in the foul wards) would have also led to their opposite, namely, an unknowable but significant number of patients with syphilis who were diagnosed differently and treated in other wards, or even other hospitals altogether.

Here it bears itemizing all the patients that we have excluded from our count. We have assumed 0 per cent for all patients treated in all other London hospitals;⁷¹ all city dispensaries (despite that one exclusively treated venereal patients);⁷² all outpatients of St Bartholomew's, Guy's, and St Thomas's (even though more than half were venereal cases by the mid-nineteenth century);⁷³ the clean wards of these hospitals (despite having every reason to suspect that some syphilitics entered them); fully 41 workhouses just in our smaller definition of London (even though we know of many that admitted venereal patients);⁷⁴ as well as all city prisons (despite that they were required to run infirmaries by the Health of Prisoners Act 1774). Just enumerating the size of this group excluded from our estimate would take another article. But it is enormous. Moreover, as explained, we have additionally eliminated all patients who did not remain in the foul wards at least five weeks in order to weed out those probably suffering other ailments. It is hoped that all of these various sizeable exclusions go a long way to address the issues of the false positives that arise from syphilis's notoriously tricky diagnosis. It is also the reason why we do not offer a range of possible estimates because the aim throughout has been to construct the minimum estimate, consistent with rigorously conservative methodological assumptions at every point in the analysis.

Finally, it is important to be clear that the measure presented here is synchronic, not diachronic. It measures the conditions prevailing at a single point in time, *c.* 1775, in the population of London. It is like a snapshot photograph taken of a dynamic scene. In order to comprehend fully why the measure is so relatively high,

⁷⁰ Siena, *Venereal disease*, p. 123.

⁷¹ Anon., *Medical register for the year 1779*, pp. 38–42, identified at least five other general hospitals, including the Westminster Infirmary, the London Hospital, the Middlesex Hospital, St George's Hospital and the Hospital for French Protestants.

⁷² In addition to the Misericordia Dispensary for venereal cases, there were the Westminster General Dispensary, General Medical Asylum, London Dispensary, General Dispensary, Surrey Dispensary, and Middlesex Dispensary; *ibid.*, pp. 42–5.

⁷³ Trumbach, *Sex and the gender revolution*, p. 198.

⁷⁴ A few examples include St Margaret's Westminster, St Sepulchre, St Luke's Chelsea, and St George Bloomsbury, all discussed in Siena, *Venereal disease*, ch. 4.

we would need something more akin to a movie film, showing us how much the population of adults aged 15–34 came in and out of the ‘revolving door’ of the capital city, so often struggling to make a living and to find security in the Great Wen. The measure constructed here is closely analogous to the synchronic measure of expectation of life at birth constructed from a period life table. That measure accurately represents the forces of mortality prevailing in a defined population throughout the age range at a single point in time, typically the date of a census, in a way that can be reliably compared with other populations, similarly measured. It does not, however, provide a guide to what actually happened to those born and enumerated at the time of the census as they subsequently aged, for which the separate techniques and data for constructing a cohort life table are required.

The method adopted here similarly provides a robust synchronic measure, which can be compared with other similarly constructed measures, of the rate of infection prevailing at a single point in time among persons aged 15–34. Due to the known mobility of the capital’s young adults, many of those contributing to the measure used here would not have been present in London a few years earlier or after the point at which they are caught in this snapshot (though of course they would have been replaced by other individuals making up the numbers that contributed to the ratio found here between the numerator and the denominator). Those living continuously in London from age 15 to 35 during the period centred on *c.* 1775 had, on average, about a 22 per cent chance of having been treated for the pox, but those individuals not arriving in London until their early twenties or leaving it in their late twenties, for instance, would have had a significantly lower average chance, approximately proportional to the number of years they spent in the capital.⁷⁵

V. Discussion

Although our results must necessarily be treated as only estimates, their implications are potentially significant and diverse. First, for epidemiological historians, such high rates of untreated syphilis, in particular, but also gonorrhoea and chlamydia, have major implications for population health, both in terms of premature mortality and levels of illness and morbidity.⁷⁶ Second, for demographic historians, various recent studies, including of Britain *c.* 1880–1911, have shown

⁷⁵ Representative evidence on migration flows in and out of London before the 1841 census first recorded birthplaces is limited. Emigration from London to North America was statistically modest, running at just under 800 per annum from 1773 to 1776; Whyte, *Migration and society*, pp. 16–21, 71–6, 88–90, 130. Landers, *Death and the metropolis*, provides the most rigorous migration estimates: tab. 5.10 shows that *c.* 1775, 19% of those aged 20–29 were net in-migrants and 6% aged 30–39, while at ages 40–49, 15% were net outmigrants. Given that those aged 20–29 and 30–39 each formed 19% of the London population, while those aged 40–49 were 16% (Landers’s tab. 5.8), this indicates large volumes both moving in and moving out, with a net preponderance inward under the age of 35 and outward above that age. A valuable recent study from parish reconstitutions of those apprenticed in London (about 5% of the populace by the 1770s) shows that at least 14% probably subsequently moved back to their home parish; Klemp, Minns, Wallis, and Weisdorf, ‘Picking winners?’, pp. 224–5. Pooley and Turnbull’s (*Migration and mobility*) database, which is not confined to apprentices, also indicates the probability that a similar substantial minority of those moving into London subsequently moved out, though Pooley cautions that the small numbers of the pre-1800 sample preclude their citation as representative statistics. With thanks to Colin Pooley for advice and running queries.

⁷⁶ For a detailed account of the dimensions of suffering involved for women and men drawn from the streets of London and other British communities in the early nineteenth century, see McCalman and Kippen, “‘Wise provision of nature’”.

that STIs occurring at these relatively high levels of incidence can have measurable and non-trivial impacts on fertility.⁷⁷ Gonorrhoea and chlamydia can raise rates of both childlessness and very small families above the levels which demographers have calculated to be due to other, 'natural' (mostly currently unknown) sources of infertility.⁷⁸ These high STI rates in 1770s London would probably have raised childlessness by about 50 per cent for women marrying at typical ages in their 20s: from 4.3 per cent to 7.0 per cent of marriages among those marrying at ages 20–24; and from 8.4 per cent to 12.6 per cent among those marrying at ages 25–29.⁷⁹

A reconstruction of the prevalence of STIs in the 1770s has potentially substantial implications for our understanding of the demography of urban growth, especially London's. There is a longstanding debate over 'the Sharlin thesis' regarding the socio-demographic consequences of migration and its implications for low fertility and high mortality, in accounting for the incapacity of early modern cities to reproduce their populations.⁸⁰ Following the seminal influence of John Hajnal, contributors to the Sharlin debate have focused primarily on nuptiality—differential access of migrants and non-migrants to marriage—as the principal cause of low fertility.⁸¹ However, if it can be shown that there was an additional interrelationship between high volumes of youthful migration and STIs, this would open up the possibility of a further, compounding reason for flagging fertility in growing towns and cities: that a higher proportion of their inhabitants, once they did manage to get married, were infertile. This would be testable if data could be found giving parity distributions among urban populations, since it would predict unusual proportions of marriages with very low parities.⁸² It would also indicate the possible importance of an additional burden of disease and ill health not previously accounted for.

Third, a high incidence of STIs in 1770s London might also help to move forward our understanding of sexuality in Georgian London. Indeed, it may even offer a vital jigsaw piece that could contribute towards solving a somewhat confounding puzzle. Historians of eighteenth-century sexuality have long relied on birth rates, especially those out of wedlock, as an empirical foundation block on which assertions about sexuality can rest. As is well known, rates of illegitimate births and prenuptial pregnancy rose substantially during the long eighteenth century, such that by the early nineteenth century a quarter of all first births were delivered by unmarried women and almost 40 per cent of brides had conceived before their wedding day.⁸³ Demographic historians view this as mainly a predictable corollary of earlier and more frequent marriage in a more dynamic labour market.⁸⁴ Others have

⁷⁷ See, for instance, the various chapters in pts. 3 and 4 of Szreter, ed., *Hidden affliction*.

⁷⁸ For full discussion of these estimates of 'natural' sterility drawn from the evidence of early modern English parish register data, see Szreter and Schürer, 'Revealing the hidden affliction', p. 384 and app. A.

⁷⁹ These calculations are all derived from tab. 12.1, in *ibid.*, p. 387, which shows that, with rates of STI prevalence in the entire population of England and Wales in 1911 running at about one-third those of London in the 1770s, this boosted by one-fifth, from 4.3% to 5.2%, the proportion of 'naturally' childless marriages, when women were aged 20–24 at marriage; and by one-sixth, from 8.4% to 9.8%, where women were aged 25–29 at marriage. The much higher figures cited here for London result from multiplying by a factor of 3 the figures in row 9 of tab. 12.1.

⁸⁰ Sharlin, 'Natural decrease'.

⁸¹ Hajnal, 'European marriage patterns in perspective'; Lynch, 'European marriage pattern'; Galley, 'Model'.

⁸² For research demonstrating the scale of this effect among professional sub-groups in the early twentieth century, see Szreter and Schürer, 'Revealing the hidden affliction', tab. 12.3, p. 292.

⁸³ Levene, Williams, and Nutt, eds., *Illegitimacy in Britain*, pp. 5–6.

⁸⁴ Wrigley, 'British population', p. 70.

argued this must signal a changing sexual culture, one that historians like Porter or Dabhoiwalla present as sexual liberation, but which scholars like Trumbach and Hitchcock cast in the darker shades of male predation and assault.⁸⁵ If there was such a new sexual regime manifest during the second half of the eighteenth century, it is typically presented as developing in London first. Wilson argued that this new sexual culture is borne out by London's illegitimacy ratio, which was considerably higher than the national average. However, Levene has revised Wilson's figures downward from 12 per cent to 7 per cent of London baptisms, from three times to slightly less than twice the national average of 4 per cent, noting that while London's rate was higher, the capital was not a 'sink of illegitimacy'.⁸⁶

Is there a contradiction between high rates of metropolitan illegitimacy and prenuptial pregnancy and the apparently much higher rates of STIs? This is not necessarily the case. As is suggested by the rather younger age-profile of female pox sufferers, wherever such age information is available, it may well be that female exposure to STIs was more concentrated than for males among the unmarried poor in the capital (and other large, growing towns), where commercial sex may have been a more regular part of the economy of makeshifts than in other less populous locations. While we cannot test it here, Trumbach's proposition that extremely high incidence of prostitution explains London's STI epidemic becomes increasingly plausible.⁸⁷

Estimates of bastardy and bridal pregnancy only capture a small portion of the larger age group that our study considers. Most Londoners faced a risk of acquiring syphilis over a much longer period than they risked getting pregnant out of wedlock. By definition once they married, on average in in their mid-twenties, female Londoners no longer risked bearing bastards. However, they continued to risk acquiring syphilis, which did not always honour marriage vows. Some husbands' commerce with prostitutes would have represented but one of numerous routes by which disease might, in Blake's contemporary words, 'blight with plagues the marriage hearth'.⁸⁸ Furthermore, there were more ways to contract syphilis than to become pregnant. An epidemiological perspective is useful because it reminds us that what we are studying first and foremost is the presence of a disease in a population. For example, Georgian wet nurses were commonly infected by nursing sick infants.⁸⁹ Oral and anal sex can communicate the disease, as can merely deep kissing if one partner harbours syphilitic sores in the mouth, a very common symptom.⁹⁰ (This is not the case for gonorrhoea or chlamydia.) Therefore, some couples who engaged in sexual play but who refrained from full intercourse, as well as those practising *coitus interruptus*, engaged in activities which, if practised with

⁸⁵ Porter, 'Mixed feelings'; Dabhoiwalla, *Origins of sex*; Hitchcock, *English sexualities*; Trumbach, *Sex and the gender revolution*.

⁸⁶ Wilson, 'Illegitimacy and its implications'; Levene, 'Origins of the children', p. 228. Adair, *Courtship*, pp. 202–23, was also generally skeptical of Wilson's high estimates, though the arguments Adair produced were not strongly convincing (notably his n. 54 on p. 212). For Wilson's subsequent analysis, see his *Ritual and conflict*, ch. 1. On London illegitimacy, see also Rogers, 'Carnal knowledge'; Hitchcock, 'Unlawfully begotten on her body'; and the recent historiographic review by Williams, *Unmarried motherhood*, ch. 1, esp. pp. 5–9.

⁸⁷ Trumbach, *Sex and the gender revolution*, p. 196.

⁸⁸ Blake, 'London', in *Songs of innocence and of experience*, n. p.

⁸⁹ Levene, *Childhood of the poor*, p. 109; Dunlap, 'Problem of syphilitic children'.

⁹⁰ Yu and Zheng, 'Syphilitic chancre of the lips'. The possibility of transmission through some forms of touch, bites, and the transfer of chewed food have also been demonstrated: Stoltey and Cohen, 'Syphilis transmission'.

an infected partner, would have carried higher risks of infection than of pregnancy. It is thus not at all impossible that many more Londoners could have contracted syphilis by the age of 35 than conceived children out of wedlock in their late teens or early twenties.

Moreover, and importantly, there may have been a dynamic relationship between these factors. If cultural historians' depictions of London seem slightly out of step with those of demographers, this may have been for at least two further reasons. First, disease was operating silently but powerfully on London fertility. To the comments above regarding gonorrhoea's and chlamydia's impact on fertility we must also add the effects of syphilis on foetal and infant survival. At least 50 per cent of pregnant women with acute syphilis will experience adverse pregnancy outcomes, with half of their babies suffering stillbirths or spontaneous abortion and the rest perinatal death and serious neonatal infection.⁹¹ The key point is that such pregnancies never would have resulted in a bastardy examination in the local parish, procedures that often transpired many weeks after a birth, when many syphilitic children would have already died; nor, obviously, would any sexually active woman rendered infertile by gonorrhoea or chlamydia ever have been called by parish officials to identify the father of her non-existent child. High rates of STIs may thus go some way to help explain why we do not see even more London women bearing bastards or going to the altar pregnant. Without the impact of STIs, the capital's illegitimacy ratio, already higher than the national average, would probably have been much higher still.

Returning to our evidence and the point about the interaction of STIs with the poverty of in-migrants, this may also help to square the circle between the historiographic antagonists. London in the course of the eighteenth century could have witnessed the efflorescence of a culture of sexual license among a section of men in the genteel classes and associated high STI rates, and yet the relationship in the general populace between sex, marriage, and illegitimacy may have exhibited rather less sensational change. This is because the evidence we have for the incidence of STIs in 1770s London shows a powerful interaction between social class and gender. Men predominated among the patients at hospitals where they had to post a bond or had sufficient contacts to provide a bond for them. Women predominated in the workhouse infirmaries. Both poor men and poor women were present in large numbers among the Lock Hospital patients, which treated in-migrants with insufficient resources or contacts to post bonds for them at the hospitals. While the men's average age at the Lock was over 28 years, the average age of women in the Lock's foul wards, at just 23.3 years, was well below the average

⁹¹ Saloojee, Velaphi, Goga, Afadapa, Steen, and Lincetto, 'Prevention and management'. A high syphilis rate in London should therefore also result in high miscarriage and stillbirth rates. Historical demographers are currently forced to make heroic assumptions about data quality and representativity to produce estimates of stillbirths. Woods deployed a modelling approach which suggested that throughout the eighteenth century London had a lower stillbirth rate of about 40/000 than the national average of about 50/000; Woods, *Death before birth*, tab. 4.5, col. 11; idem, 'Mortality in eighteenth-century London', fig. 3. An unpublished report on a higher-quality source, the sextons' books of the massive London parish of St Martin in the Fields, questioned the validity of Woods's methodology, and concluded that evidence-based estimates for London at this time cannot be estimated with any security because the majority of 'stillborn' burials in St Martin in the Fields were burials of liveborn unbaptized infants who died in the first few days of life, while true stillbirths were probably under-recorded. In the workhouse of St Martin in the Fields stillborn burials seem to have been recorded with greater accuracy after c. 1783, and the stillbirth annual rate averaged 104/1,000 births in the years 1784–99; Davenport, 'Relationship', p. 6. However, this probably reveals little about stillbirth rates in the wider metropolitan population.

age of marriage. It was, in fact, the same average age as the capital's prostitutes, who were also mostly aged 18–25 and 60 per cent from outside London.⁹² Most of Boswell's STI episodes came from commercial sex. This indicates that STIs were rife among, on the one hand, young, impoverished, mostly unmarried women, either using commercial sex to support themselves financially or in situations that rendered them vulnerable to sexual predation and assault like domestic service; and, on the other hand, among two sets of men: first, poor in-migrant men, rather older than the Lock women but probably also still unmarried and on the margins of the metropolitan economy; and second, a range of more established men, able to pay for hospital or private treatment. The emergence of a more licentious code among this latter class, perhaps partly in reaction against the second wave puritanical Reformation of Manners, c. 1690–1730, would not necessarily alter much the conventions and customs surrounding the institution or timing of marriage itself across the majority of the more respectable and established London population. However, it could have increased STI transmission rates before, after, and within marriage (and also to female domestic servants), which could have had quite a substantial 'bridging' effect in elevating overall STI rates.⁹³

With regard to STI infection rates, pre-modern historians of sexuality have proceeded with understandable caution, because numerous obstacles—the conflation of gonorrhoea and syphilis primary among them—made fixing estimates of such rates seem methodologically unwise. However, if reliable and conservative estimates of rates of sexual infection in earlier historical populations can be achieved, they could provide historians with a powerful new tool to allow access to one of the most private, and therefore historically hidden, human activities. Although the estimate produced here has indicated a high incidence of STIs in London in the 1770s, without other comparable estimates we cannot know for sure whether this was a higher rate than prevailed in London 50 or 100 years earlier. We do know that by c. 1911 the comparable rate in London, at 11.4 per cent, was only about half that of the 1770s, though of course London was by then a far larger contiguous entity with a much greater proportion composed of a suburban populace.⁹⁴ Clearly, the high rate found here in the 1770s was the product of many features of the capital, including its global port and the presence of soldiers quartered in their barracks in the capital.⁹⁵ In Chester, by contrast, there was a skeleton military force in the castle, a small port of declining significance

⁹² Henderson, *Disorderly women*, tab. 2.1, and figs. 2.1–2.5, pp. 19–25; Siena, *Venereal disease*, pp. 235–6. As on average Lock women reported falling ill six months prior to hospitalization, their average age when contracting the disease would have been even younger, roughly 22.8 years.

⁹³ If a rising proportion of married men joined a proportion of the unmarried in paying for sex as a new social practice, culturally influenced, in London from c. 1730 onwards, this would constitute a 'bridging' function, in the terminology of the epidemiologists' transmission model, between two previously non-communicating (sexually) sections of the population, the unmarried where infection was widespread, and the married, where previously it was not. Such a rise in 'bridging' activity can increase STIs quite significantly; and would do so even more if it also entailed increased predatory activity of men towards young, female domestic servants. For examples of such 'bridging' effects and further explanation of the epidemiologists' transmission model, see Szreter, *Hidden affliction*, pp. 20–2. Bernard Mandeville's writings from 1723 onwards were a leading example of a 'shocking' new literature publicizing licentious behaviour among the London elite, to whom he provided medical services for their nervous conditions; Hundert, *Enlightenment's fable*, pp. 208–16.

⁹⁴ Szreter, 'Prevalence of syphilis', tab. 3.

⁹⁵ See Hurl-Eamon, *Marriage and the British army*, pp. 9–17. Approximately 15% of males treated in St Thomas's Hospital index and registers combined, 1768–76, were in military service, identifiable by a regimental agent listed as the sponsor: 12% were soldiers; and 3% sailors and marines. Hurl-Eamon has advised that soldiers

due to the rise of Liverpool, and no Lock Hospital or need for the workhouse to provide its own foul wards. A major characteristic of the capital was the high volume of mobility and precarity among young adults aged 15–34, including the strong preponderance of young women among the in-migrant flow, often placed in positions of domestic as well as economic dependence on their mostly male employers.⁹⁶ None of these contributing sources in the capital ‘explains away’ the comparatively high STI rates of Boswell’s London, but they do help us account for and understand it.

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stationed in London in the eighteenth century should be considered as residents of the capital (and they have been included in the denominators used here, as they are based on Wrigley’s recent methods for estimating the capital’s population as outlined above in n. 54). If, despite Hurl-Eamon’s advice, all military patients were excluded from the calculations and it was also assumed the military used Guy’s and St Bartholomew’s to the same extent as St Thomas’s, this would reduce the two final estimates in tab. 3 by 4.5%: from 23.26% down to 22.2%; and from 21.12% down to 20.2%.

⁹⁶ There are no published estimates of the gender ratio in London in the 1770s, but there is consensus among historians that with the decline in male urban apprenticeship in the seventeenth century and female rural service during the eighteenth century, there was a pronounced shift from previously male to female preponderance in the net migration to all British cities; Sharpe, ‘Population and society’, pp. 495–9; Whyte, *Migration and society*, pp. 72–4. In 1774 Chester had 83.5 men for every 100 women, while London in 1801 had 83.9 men per 100 women; Szreter, ‘Treatment rates’, tabs. 6A and 6B; Wrigley, *Early English censuses*, tab. M1.1.

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Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

- S1. Calculating the extent of repeat patients presenting for venereal treatments at St Thomas's Hospital through analysis of the Indexes to the Admission Registers, 1769–71
- S2. Adjustments to the estimate for the population of London c. 1776 to produce the appropriate denominator
- S3. Estimating the proportion of London's population that was genteel in the mid-1770s