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'I think it highly necessary to have it done before they go out into the World'; inoculation, responsibility and patterns of familial transmission of smallpox.

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This paper examines two research streams. Firstly, it will discuss some contemporary familial perspectives on smallpox inoculation in the eighteenth century. This is followed by a look at the level of provision of the practice in Oxfordshire and some of its contiguous counties. Secondly, the paper will present some findings on the nature of the transmission of smallpox during local early eighteenth-century epidemics in Banbury in Oxfordshire and Aynho, Northamptonshire. Finally, the paper will put forward some conclusions which encompass these two streams.

The words above were written in 1786 by Elizabeth Leathes, a Norfolk clergyman's wife and young mother, in a letter to her parents, James and Elizabeth Reading, in Woodstock, Oxfordshire. In the letter, Elizabeth is trying to persuade her parents to agree to their grandchildren being inoculated against smallpox. Though living at a distance, the Readings were attentive parents and grandparents; inter-generational bonds between the two families were strong and the judgements of the older couple were heard and respected. However, the topic of inoculation against smallpox provoked tensions and conflict between the two generations, shaping a central theme in a series of letters between them over a period of seven years. Eventually, Elizabeth was successful in cajoling the Readings to agree to the wishes of the young parents to go ahead with the procedure and the children were finally inoculated.

Inoculation involved the transfer of matter from a person with 'natural' or 'live' smallpox into a healthy person to confer immunity to the disease. The inoculated patient could become very ill and at a time of high infant and child mortality, fear and apprehension were understandable. Notably, for parents who decided to proceed, a time of extreme anxiety

ensued as they kept a close vigil on their offspring, probably further evoked by their own instigation of the difficulties their children were facing.

Eighteenth-century families had two underlying fears – those of the disease itself and the new(ish) technology intended to guide their children safely through it. (As Eriksen has suggested, the idea that smallpox could be eradicated through inoculation was not the aim when it was introduced into Europe in the 1720s, more a safer way of enduring a life-threatening illness.¹) On the former, the enduring fear of smallpox in most of the eighteenth century was a recurring topic both in print and life-writings of the period, often generating expressive and emotive language. For example, the term ‘raged’ was commonly used in contemporary accounts of the disease; in 1758 *Jackson’s Oxford Journal* reported on ‘... the fatal distemper [smallpox] which now most violently rages among them’ [the inhabitants of Burford, Oxfordshire]. The ‘constant terror of this loathsome and fatal disease’², was only allayed when those susceptible had safely passed through it, either by experiencing natural smallpox or, in the second half of the eighteenth century, through inoculation.³

Trepidations over smallpox persisted in the Leathes’ household for over a decade as the children grew up. Correspondence on smallpox dominated those of any other illness; the family’s reports on their children’s experiences of measles and whooping cough, for example, lacked the sense of ordeal associated with smallpox. Deep concerns over family members, including staff, who had been in contact with the disease or were believed to be sickening were raised regularly in correspondence through intense and protracted discussions.

On the latter, and as seen in the correspondence of the Leathes family above, parents and carers were often adamant about the efficacy of the practice of inoculation, although interestingly, this resolve was perhaps associated with those of a more liberal persuasion. This point is suggested in the case of the Leathes’ family and demonstrated further in the following two cases. Arthur Young’s inoculation in London in 1753 was ‘a scheme of my mother’s’ and conducted without his father’s consent.⁴ Arthur attributed his father to

¹ A. Eriksen, ‘Cure or Protection? The Meaning of smallpox inoculation ca 1750 – 1775’, *Medical History* 57 (October 2013): 516.

² *Gentleman’s Magazine*, 1747, 270-1.

³ Inoculation was introduced into England in the 1720s. It was slow to gain credibility and was not widely practised until the 1760s onwards.

⁴ M. Betham-Edwards, *Autobiography of Arthur Young*, (1898), 9.

<http://archive.org/stream/autobiographyofa00youn#page/n17/mode/2up>

‘rejecting all proposals touching upon novelty’.⁵ As this newly-inoculated 12 year-old ran out to greet his father he recalled his mother ‘... exclaimed in a triumphant tone, ‘There! I have had Arthur inoculated, and you enjoy the comfort of knowing that your boy has had that terrible disorder’’.⁶ This story has been rightly highlighted by M. Bennett as an example of a woman’s triumph over male patriarchy.⁷ However, it perhaps also reveals a shared triumph and demonstrates his parents’ liberation from further anxiety over the disease. Thomas Wright was inoculated in Yorkshire in the 1740s in order ‘to preserve ... life’.⁸ However, although his own children ‘begged to be inoculated’ he resisted as his parents-in-law were ‘bitterly prejudiced against the practice’.⁹ His children did, in fact, contract smallpox in 1782 which was fatal for his young son, William.

Inoculation practitioners have received little previous attention from historians, although the extent and volume of their operations are significant as they suggest likely levels of immunity in a community. The following section, utilises information derived from *Jackson’s Oxford Journal*.¹⁰ A close examination of all the advertisements placed by inoculators, from the inauguration of the newspaper in 1753 until the end of the century, a period of nearly 50 years, provides a comprehensive picture of likely levels of provision in the region and how these fluctuated throughout the period. This detail has been supplemented by information from private correspondence, public announcements and secondary literature. Table 1 shows the number of inoculation programmes in parishes in Oxfordshire and the surrounding counties. This data is drawn mainly from the *Journal* so perhaps unexpectedly, Oxfordshire and Berkshire were especially active with over 130 programmes in these two counties being undertaken in a range of parishes.

⁵ Ibid., 8-9.

⁶ Ibid., 9.

⁷ M. Bennett, ‘Inoculation of the Poor against Smallpox in Eighteenth-Century England’ in A. Scott, *Experiences of Poverty in Late Medieval and Early Modern England and France* (Farnham: Ashgate Publishing, 2012), 216.

⁸ T. Wright (ed.), *Autobiography of Thomas Wright of Birkenshaw*. London: John Russell Smith, 1864, 21 <http://archive.org/stream/autobiographyoft00wrig#page/n7/mode/2up>.

⁹ Ibid., 152.

¹⁰ The *Journal* had a likely circulation of around 2,000 copies and each copy was probably read by more than one person and accessed by the illiterate through hearing it read aloud. See H. Barker, *Newspapers, politics and public opinion in late eighteenth-century England* (Oxford: Clarendon Press, 1998), 34-53.

Table 1. *Inoculation programmes by county; 1758-1799.*

| County | Number of programmes |
|-----------|----------------------|
| Berks | 34 ¹¹ |
| Bucks | 22 |
| Gloucs | 10 |
| Northants | 3 |
| Oxon | 97 |
| Warwicks | 4 |
| Wilts | 2 |
| Total | 172 ¹² |

Sources: *Jackson's Oxford Journal 1753-99*; E. G. Thomas, 'The Old Poor Law and Medicine' *Medical History* 24 (1980): 10-11; J. Moody, *The Great Burford Smallpox Outbreak* (Burford: Hindsight 1998), 22; *NRO*, BOL 2/95/11. Letter James Reading to Elizabeth Leathes (25 June 1780).

These figures are likely to be an under-estimation as they mainly comprise the work of peripatetic practitioners, moving from one parish to another, advertising their presence in a local newspaper. Moreover, some practitioners also provided inoculation under the Poor Law, treating a whole community at parish expense. In 1779, for example, practitioners Palmer in Wantage, Berkshire and Southam in Broughton, Buckinghamshire were collaborating with local parishes.¹³ Others, such as community physicians, or in a case in Oxford, the local coroner, added the practice to their portfolio.

Some inoculators worked out of people's homes, others set up inoculation houses, built or rented specifically for purpose and receiving up to 100 patients at a time. These houses were

¹¹ Historic boundaries; 33 of these parishes were incorporated into Oxfordshire in 1974.

¹² Low numbers in Northamptonshire, Warwickshire and Wiltshire may indicate a disinclination to advertise widely.

¹³ *Jackson's Oxford Journal (JOJ)* (18 December 1779).

established on the outskirts of populated areas, admitting inoculees for periods of up to three weeks. Practitioners operated a roll-on, roll-off system; sets of patients were received at intervals; as one group was discharged or moved to an ‘airing house’, another group was called upon.¹⁴ The heyday of inoculation practice in the area appeared to be 1768 when approximately 30 separate practitioners were advertising their services in the local newspaper, placing over 80 advertisements between them and working across 26 parishes in the area. Practitioners operated an inclusive policy in terms of ability to pay, basing their fees on a sliding scale according to financial circumstances of the client, many offering reasonable terms for the less well-off. Significantly, in 1768, when prices were at their peak at approximately six guineas per person, the number of advertising practitioners was also at its highest, suggesting that demand had outstripped supply, which in turn led to more practitioners entering the market.

Advertisements promoting these houses were targeted within the cultural fashions of the day, associated with sensibility and the withdrawal from the world to be part of nature, transforming an otherwise negative experience into a positive, unblemished distraction. In the advertisement below for example, particular reference is made to the ambience of the surroundings in relation to flora, fishing and arcadia, depicting an aura of privacy, solitude and well-being.

... large commodious [inoculation] house surrounded by Plantations of Shrubs, Evergreens, containing near an Acre of Ground, with extensive Gravel Walks and Bowling Green extremely well calculated for Airing, Exercise and the Amusement of the Patients ... with fishing in the River Evenlode ... romantic scenes in Wychwood Forest.¹⁵

Patients were invited to ‘take air’ after their treatment, sometimes provided by a separate airing house, or otherwise, the surrounding isolated countryside. Airing was believed to reduce cross infection and practitioners promoted this facility. In the Oxfordshire region separate airing houses began to be advertised from the late 1770s, most likely as a response to community concerns about contagion and the fear that recently inoculated patients could spread the disease. Measures to contain patients undergoing inoculation were promoted with

¹⁴ See *JOJ* (17 November 1764).

¹⁵ *JOJ* (26 February 1785).

the deposit of a pledge, whereby patients kept within the boundaries of the house during treatment. Monies from broken pledges went towards providing poor relief.

Relationships between providers and the local communities appeared to be good, as long as the former remained within the bounds of local restrictions, situating their premises away from where the general public were likely to roam. Generally, local communities were thankful when practitioners moved in to carry out general inoculations especially when a smallpox epidemic was present. (Unsurprisingly, these instances helped to fire the debate on whether or not inoculees were likely to spread the disease.) Smallpox could have a disastrous effect on trade and it was common practice, especially for market towns, to insert a notice in the local newspaper when their communities were free of the disease and business could be resumed safely. One of the most striking example of a positive working relationship between an inoculator and local communities is seen in Quainton and Stoney Stratford, in Buckinghamshire in the 1770s, whereby the completion of the programme was accompanied by a celebration at which the poor of the parish were fed abundantly at the inoculator's expense and entertained with, '... people adorned with ribbonsmaurice [*sic*] dancing, ringing of bells, bull-baiting'.¹⁶

The accounts above do not provide a fully comprehensive picture of provision, of course; promotions through the medium of print are not always evidence of activity, although most strongly suggest this was the case, with evidence of practitioners enjoying lucrative rewards. It is also supposed that those who marketed themselves with claims of achievement over a period of months or years, as most did, experienced some degree of success. Sometimes we do gain a clear insight into levels and range of provision. As examples, one operator transferred his practice to Buckinghamshire from Essex in 1766 where 'few in Comparison remain now to be inoculated in that Part of the Country where he resided'.¹⁷ Another, also in Buckinghamshire in the same year claimed, '... among the great Numbers of Infirm which were necessitated to be inoculated, several were upwards of 80 Years of Age, some Bed-ridden, others lame, some blind, and nineteen women big with Child'.¹⁸ We also understand that parishes were often revisited, presumably to pick up those untreated first time around. Programmes were operating in Dorchester, Oxfordshire, for example, in 1789, 1794 and

¹⁶ *JOJ* (30 November 1776).

¹⁷ *JOJ* (5 April 1766).

¹⁸ *JOJ* (9 November 1776).

1799, at parish expense.¹⁹ Further afield in Reedham, Norfolk a two-week inoculation programme was carried out in June 1780 and rolled out again in 1784 and 1786, thereby covering a six-year period.²⁰ Finally on this point, for some communities, scarring as a result of an episode of smallpox appeared to be noteworthy by the end of the century; William Holland, in Somerset noted in his diary in 1799, ‘... a large hulky fellow, a face absolutely furrowed with the small pox (a very uncommon thing in these days of inoculations)’.²¹

So how does the commentary above translate into evidence of impact on any reduction of smallpox deaths in the region? To do this, this paper now looks at Oxfordshire burial registers in detail. Causes of death from smallpox are recorded consistently enough in the registers to indicate the significance of the disease within a community. Data has been extracted from approximately 237 parishes in the county with substantially extant burial records between 1700 and 1799. (Oxford city parishes are outside the remit of this enquiry).

Table 2 shows all the parishes in Oxfordshire that saw especially high smallpox mortality between 1700 and 1799; ie those with smallpox burials comprising more than 50 per cent of total burials for each parish for that particular year. (N.B. Many other Oxfordshire parishes saw lower smallpox mortality figures throughout the period; these are not listed here.²²) The table shows that the majority (11 out of 13) of these severe outbreaks occurred prior to 1767. After this date only Kelmscott in 1791 and Cuxham in 1772 are included in this list, although as small parishes with populations of under 150, percentages are skewed by low numbers. The table demonstrates that smallpox was being controlled more effectively during the latter part of the century with the majority of the severe outbreaks occurring prior to the late 1760s. This ties in with the timescales associated with inoculation practice in the region, suggesting that it played a part in this pattern.

Table 2. *All Oxfordshire parishes with smallpox burials comprising more than 50 per cent of total burials, 1700-99.*²³

¹⁹ *Oxfordshire History Centre*, PAR87/5/A1, ‘Dorchester Overseers Accounts’.

²⁰ *Norfolk Record Office*, BOL 2/30/10; 2/36/16; 2/38/13.

²¹ J. Ayres (ed.), *Paupers & Pig Killers; The Diary of William Holland A Somerset Parson, 1799-1818* (Stroud: Sutton Publishing 2003), 18.

²² See R. A. Leadbeater, (2015) *Experiencing smallpox in eighteenth-century England*, PhD, Oxford Brookes University, 49-56.

²³ *Baptism and Burial Register of Banbury, Oxfordshire part two 1653-1723* ed. J. S. W. Gibson. (Oxford: Banbury Historical Society, 9, 1969); *Burial Register of Banbury, Oxfordshire part three 1723-1812* ed. J. S. W. Gibson. (Oxford: Banbury Historical Society 18, 1984).

| Year | Parish | Smallpox burials | Total burials in smallpox year | Smallpox burials as per cent of total burials |
|------|-----------|------------------|--------------------------------|---|
| 1707 | Bicester | 48 | 76 | 63.2 |
| 1714 | Eynsham | 24 | 33 | 72.7 |
| 1715 | Eynsham | 18 | 28 | 64.3 |
| 1719 | Banbury | 72 | 120 | 60.0 |
| 1724 | Islip | 12 | 19 | 63.2 |
| 1733 | Banbury | 80 | 132 | 60.6 |
| 1758 | Burford | 185 | 247 | 74.9 |
| 1758 | Kencott | 4 | 6 | 66.7 |
| 1759 | Kencott | 3 | 5 | 60.0 |
| 1764 | Goring | 9 | 17 | 52.9 |
| 1765 | Goring | 7 | 11 | 63.6 |
| 1772 | Cuxham | 9 | 10 | 90.0 |
| 1791 | Kelmscott | 3 | 3 | 100.0 |

The second half of this paper takes an in-depth look at familial transmission of smallpox, investigating three smallpox epidemics for which we have some detailed data. The reconstitution work by the Cambridge Group for the History of Population and Social Structure selected Banbury in Oxfordshire as a parish with ecclesiastical records of sufficient quality to be included in their study. This data has been combined with a parish register analysis identifying smallpox deaths. The occurrence of two separate and carefully documented smallpox epidemics in Banbury, in 1718-19 and 1731-33 allows for a comprehensive exploration of susceptibility and familial transmission within the parish. A further source consulted is a contemporary report on a 16-month smallpox epidemic in Aynho, Northamptonshire, produced for the Royal Society. This document records the course of the disease for 130 individual patients (approximately one third of the population), noting

age of patient, symptoms and length of illness.²⁴ (All the deaths in the report are also recorded in parish burial registers.)

Returning to Banbury, parish burial registers indicate that 119 parishioners died of smallpox during 1718/19 and 93 from 1731 to 1733.; These can be broken down as follows; 1718-19: 28 men, 23 women, 68 children, 1731-33: 13 men, 20 women, 60 children. As might be expected, children comprised the largest group of fatalities in both outbreaks. (18 smallpox deaths cannot be linked to a nuclear family in the first outbreak and 14 in the second; however, the majority can be traced within the full family reconstitution.) The proportion of adult smallpox deaths was lower in the second outbreak with men, particularly, less fatally affected. This point is further emphasised by the fact that four out of the eight men identified through family reconstitution were likely to have been in-migrants (they and their families were not in observation in parish registers before or during the first outbreak). Of the families native to Banbury, many adults were likely to be immune to the disease thirteen years after a previous outbreak, due to exposure first time around.

In 1718-19, 51 families with children experienced one or more child smallpox deaths with nine of these families tragically burying more than one of their children. Family sizes ranged from one to nine children. However, larger families were no more likely to experience higher child smallpox mortality at this time than those with fewer children. A similar pattern is seen in the second outbreak in 1731-33. From 47 families with child smallpox deaths, there is no clear correlation between family size and the number of child smallpox deaths.²⁵ It is unexplained why the majority of families experienced one child death regardless of their original size at the beginning of the outbreak, but it may be connected with isolation practices enacted by the parish during the epidemics.

In the families that experienced child or adult smallpox deaths in the first outbreak, infants fared worse; 50 per cent of all children in these particular households (who were infants at the beginning of the outbreak or born during it), succumbed to the disease. In the other age groups the proportion is less than half this figure except for the 10-14-year olds. It is speculated that children in this age group were making their first reconnaissances away from

²⁴ *Royal Society* Cl.P./23ii/87. 'Account of those who had ye smallpox from September 1723 – December 1724'.

²⁵ Leadbeater, R A (2015) *Experiencing smallpox in eighteenth-century England*, PhD, Oxford Brookes University, Ch. 4.

the family home both socially and as casual wage earners and were therefore newly exposed to distinct forms of contagious disease in the wider environment. However, little evidence supports this, although this pattern has also been found in other studies of smallpox. The apparent susceptibility of those aged 11-15 was claimed by historian J. Smith in 1987 to be 'somewhat puzzling'.²⁶ The second outbreak saw infants faring better, with 25 per cent of the cohort in mortality-affected families succumbing to the disease, although this may in part be due to the duration of the 22-month outbreak, whereby some mortality-affected children survived beyond their first year of life. Another reason for the infant cohort doing comparatively well second time around could be attributed to some parents (and older children) gaining immunity through previously experiencing the disease in the community as young people, with less risk, therefore, of infecting the most vulnerable in their households. (This point will be returned to later.)

Parental smallpox deaths can also be fitted into the picture of familial transmission. It is important first to examine the background evidence on the likelihood of adult immunity to the disease prior to the first outbreak. There is no record in parish burial registers of smallpox deaths occurring in Banbury between 1669 and 1718.²⁷ (Notably, even when smallpox caused very few deaths in a community, they were often singled out for identification in parish registers. This was a regular feature of other Oxfordshire parishes and areas beyond. Given the quality of the Banbury registers it is likely that individual or small numbers of smallpox deaths were faithfully recorded.) More widely, the incidence of smallpox in the population at large was low between 1695 and 1710, the disease becoming more virulent between 1710 and 1730.²⁸ Under endemic conditions, typically in large urban areas, smallpox was mainly a disease of children.²⁹ When an area had been free of the disease for a long time, however, (as Banbury had) then mortality in adults was higher. This scenario is also evident in Aynho in 1723/4 where the risk of death for sufferers was greater for adults than children. In this

²⁶ J. R. Smith, *The Speckled Monster* (Chelmsford: Essex Record Office Publication no 95, 1987), 64.

²⁷ *Victoria County History Oxfordshire*, Vol X (1992). <http://www.british-history.ac.uk/report.aspx?compid=63793&strquery=pest+house#n257>;

No cases recorded in burial registers in the eighteenth century prior to 1718. See *Baptism and Burial Register of Banbury, Oxfordshire part two 1653-1723* (ed.) J. S. W. Gibson. (Oxford: Banbury Historical Society 9, 1969).

²⁸ Dixon, *Smallpox*, London: J. & A. Churchill Ltd (1962), 195. US National Library of Medicine, <http://www.nlm.nih.gov/nichsr/esmallpox/esmallpox.html>.; P. Razzell, *The Conquest of Smallpox* (Firle: Caliban Books, 1977), 132.

²⁹ See R. Davenport, L. Schwarz, J. Boulton (2011). 'The Decline of Adult Smallpox in Eighteenth-century London', *Economic History Review*, V.64, 4.

outbreak, 50 adults contracted smallpox, of whom 13 died, alongside 81 children with 12 deaths.³⁰

Smallpox transmission was greatly influenced by frequency and intimacy of contact with others, being most frequent in the close association with the family group.³¹ The risk of infection when it was introduced into a general population, however, depended on conditions such as density of population, social custom, levels of mingling in the workplace and geographical barriers. C. W. Dixon's research on the risk of smallpox transmission in the nineteenth-century (in an unvaccinated community) (cautiously) suggests the chance of being attacked through casual contact was approximately 9.7 per cent, rising sharply in households where smallpox was present to 75 to 80 per cent, depending on age profile.³²

Looking further at parental mortality, in the first Banbury epidemic 7 fathers and 8 of their children died of smallpox. Six children were buried after their fathers and two before. On maternal and child smallpox burials, three mothers died of smallpox alongside four of their children, all maternal burials occurring first. In the second outbreak, one father and his child died of smallpox and six mothers lost their lives to the disease, together with seven of their children. Overall, in the majority of these cases, the parental burial occurred first. (Re-entry of infection appears unlikely in most families, with short intervals between burials.)

These figures are very small, of course. However, this pattern also correlates with the timing of smallpox deaths of young children. Taking the under-fives overall, in 1718-9 only three out of 21 under-fives were buried in the first eight weeks of the outbreak and only one out of 22 in the same period during the second in 1731-3. In the latter, the second under-five smallpox burial occurred a full five months into the duration of the epidemic. (These figures do not, of course, include infants as yet unborn eight weeks into the epidemics). This pattern is also seen in Aynho in 1723-24 where, although no infants were fatally affected, the first child in the under-five age group was recorded seven weeks into the outbreak and the first death in this group occurred approximately one month later.

³⁰ *Royal Society* Cl.P./23ii/87. 'Account of those who had ye smallpox'. (The ages of two sufferers are unknown.)

³¹ *Scientific Group on Smallpox Eradication*. 'Smallpox Eradication', World Health Organisation Technical Report Series No. 393. Geneva: World Health Organisation, (1968), 17.
http://whqlibdoc.who.int/trs/WHO_TRS_393.pdf.

³² Dixon, *Smallpox*, London: J. & A. Churchill Ltd (1962), 196. US National Library of Medicine, 310-19.
<http://www.nlm.nih.gov/nichsr/esmallpox/esmallpox.html>.

Conclusions

The section above indicates two points. Firstly, in both Banbury epidemics in families that experienced parental and child smallpox death, parents died before their children. Overall, 75 per cent of parents were buried before their children, suggesting a transmission pattern of parent to child (or sibling to sibling, of course).³³ Secondly, taking the timing of smallpox deaths of young children in the three epidemics in Banbury and Aynho, very few in this group succumbed in the first stages of each outbreak. Transmission for very young children appeared to be through familial links rather than the wider community. In other words, the greatest risk for these young groups was from within the home environment. This could have important ramifications for the management of modern-day diseases, especially for families and communities previously unprotected through vaccination programmes. Parents, as well as their young children, need protection against infectious disease.

Finally, in bringing together both these discussion streams, although familial dilemma and sometimes discord over inoculation practice was evident, life-writings suggest that the procedure was generally more accepted and highly valued by a younger generation, that is, parents of young children. Many in this group were prepared to offset the risks associated with the procedure against the benefits of immunity to a common and life-threatening illness. Further detailed research on other areas of the country would provide a fuller picture; however, Oxfordshire and its regions appeared to experience high levels of inoculation activity. With a demand-led provision for all ages, practitioners particularly flourished in the 1760s – 70s, their operations attracting high financial reward. Bearing this in mind, and returning to likely familial transmission routes, many children inoculated in this heyday and beyond had become parents themselves by the end of the century. As protected adults they contributed to making their homes a safer place and in turn helping reduce the risks of smallpox deaths in their own young children.

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³³ Although assessing order of transmission is problematic, we know from the Aynho data that children did not appear to have suffered for shorter or longer periods than adults. In this parish duration of illness ranged from between one and 45 days with an average of 13 days. 23 people were sick for over 20 days, 11 of whom were under 21; there appeared to be no correlation between length of sickness and age of patient. See *Royal Society*, 'Account of those who had ye smallpox'.

