The pertussis vaccine controversy in Great Britain, 1974–1986

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Abstract

This historical essay analyzes the role played by Great Britain in the pertussis vaccine controversy of the 1970s and 1980s. Public backlash against this vaccine not only took place earlier in Britain than the United States, but also was so widespread that a series of whooping cough epidemics soon followed. As with the more recent dispute involving measles–mumps–rubella (MMR) vaccine and autism, the United Kingdom played a primary role in defining, promoting, and ultimately exporting this controversy. This essay seeks to explain this phenomenon by situating it in Britain’s long history of suspicion regarding vaccines evident among both the public and the medical profession, a theme dating back to the compulsory vaccination laws of the 19th century. It argues that anti-vaccinationism, far from being simply a new development related to the public’s lack of awareness of childhood vaccine-preventable illness, actually represents a revival of a much older movement.

Keywords: Immunization; Whooping cough; Pertussis

The pertussis vaccine controversy of the 1970s and 1980s marked the most significant setback for the cause of immunization since the smallpox vaccine debates of the previous century. International in scope, it swept through most of Europe and Japan in its first phase prior to eventually affecting the United States, Soviet Union, and Australia [1]. This paper will examine how it affected the United Kingdom, where media reports alleging the potential of pertussis vaccine to cause neurological injury led to a sharp decline in public acceptance during the mid-1970s. There followed a series of much-publicized whooping cough epidemics that have since become an object lesson for the international public health community demonstrating the importance of childhood immunization. Yet, for all the story’s notoriety, it has received little historical analysis. This remains true even as more recent controversies, such as that revolving around the purported association of measles–mumps–rubella (MMR) immunization and autism, illustrate the importance of understanding the dynamics of anti-vaccine agitation [2].

Most commentary citing the British pertussis vaccine experience has taken to task the media for exaggerating and sensationalizing the vaccine’s potential for harm while neglecting the dangers of whooping cough itself. This essay will argue that, although the press certainly did play a role in initiating the crisis, it was hardly the only factor. The British medical profession itself was deeply divided, reflecting quite real uncertainties surrounding the safety and efficacy of the vaccine in the 1970s. Parents in vaccine victim advocacy groups played an additional important role in sustaining the crisis. The ambivalence of both public and medical profession, it will be suggested, are best understood against the background of Britain’s long history of skepticism regarding many vaccines dating back to smallpox.

1. The vaccine revolt

By 1970, the diphtheria–tetanus–pertussis (DTP) combination had been routinely used in Great Britain for over 20 years. Though not eradicated, whooping cough had become a much less common disease in comparison with its incidence in the mid-20th century. During the 1940s, it had afflicted 60–70% of British children prior to completing school and caused over 9000 deaths, the vast majority of which were among infants. This mortality figure exceeded that from any other infectious disease in childhood at the time [3]. When the United Kingdom emulated the example of the United States by introducing routine immunization in the 1950s, disease rates fell and such memories gradually faded from public consciousness.

Yet, pertussis vaccine raised problems of its own. A whole-cell preparation that had changed relatively little since the early-20th century, it often caused fevers that could rarely precipitate outright seizures. More ominous were case reports (mainly between 1948 and 1960) describing possible

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vaccine complications ranging from encephalopathy and coma to permanent neurological injury and death [4,5]. In retrospect, it is difficult to judge how many of these cases represented other degenerative neurological processes emerging coincidentally in infancy. Given the undeniable consequences of whooping cough itself, few physicians openly questioned the continued use of the vaccine. Many were reassured by the fact that the most important and rigorous clinical trials of the immunization prior to 1960, conducted by the British Medical Research Council (MRC) and involving over 36,000 children, reported no cases of encephalopathy [6]. The vaccine’s safety profile thus raised little concern until whooping cough itself became less common in the 1970s. In January 1974, however, the publication of a case series from the Hospital for Sick Children at Great Ormond Street suddenly brought pertussis vaccine under public scrutiny. The article described 36 children who, the authors believed, had suffered severe neurological complications following their DTP immunization [7]. Few within the medical profession foresaw the storm of media publicity that soon followed. Television documentaries and newspaper reports dramatized tragic stories of profoundly retarded children allegedly injured by the vaccine [8]. The London Times, for example, uncovered the story of a severely incapacitated young man believed by his parents to have been disabled in the 1950s MRC pertussis vaccine trials (but not reported). Disclosure that the original records of the trial had been destroyed by fire only further heightened suspicions [9,10]. Parents convinced that their children’s disabilities resulted from pertussis immunization joined together to form an advocacy group, the Association of Parents of Vaccine-Damaged Children, which played a major role in focusing public attention on the issue [11]. The result of all this negative publicity was a rapid fall in immunization rates against whooping cough. Though the Joint Committee on Vaccination and Immunization (JCVI) met and affirmed the vaccine, the government (reflecting a general climate of uncertainty) launched no major campaign to restore public confidence [12]. By 1977, coverage against pertussis had declined from 77 to 33%, falling as low as 9% in some districts [13]. The first of what would become three major epidemics of whooping cough followed soon thereafter. By the time it subsided in the middle of 1979, authorities had reported 102,500 cases throughout the United Kingdom, far more than in any comparable time period since the widespread use of the vaccine (Fig. 1). Though the case fatality rate was lower than in previous epidemics, an estimated 36 children (mainly infants) died in the course of the outbreak [14].

2. A house divided

Despite these figures, great opposition to the vaccine continued inside as well as outside the medical profession. A significant perceptual divide separated advisory bodies such as the JCVI, which continued to recommend the vaccine, and the general practitioners and home visitors who actually administered it. A 1977 survey of general practitioners by the London Times found that that 47 of 97 respondents would not recommend the vaccine unless specifically requested by the parent [15]. Health care providers on the front line tended to interpret the contraindications to vaccination far more liberally than did the government’s advisors. For example, in one survey about half of primary care providers recommended withholding the vaccine from an infant who had been “jittery” following a breech delivery. Official recommendations were sufficiently ambiguous to allow the exclusion of many children on the basis of categories such as prior “cerebral irritation,” neurological deficits, febrile illness, or family history of epilepsy or allergy [16].

Even at higher levels, a vocal minority of physicians in positions of influence joined the fray. John Wilson, senior author of the 1974 case series that had ignited the crisis, continued to criticize the JCVI in public [17]. One of the members of the JCVI, George Dick, criticized in print his own committee’s decision to endorse the vaccine in 1974 [18]. The most confrontational physician opposing the vaccine, however, soon emerged in the person of Gordon Stewart, a medical professor at the University of Glasgow. Stewart was sympathetic to the kinds of arguments gaining favor in the public health community during the 1960s and 1970s minimizing the role of antibiotics and medical interventions in the decline of infectious disease [19]. In 1977, he published a series of 160 cases of encephalopathy that, he asserted, represented likely pertussis vaccine reactions. Parents aware of his interest had brought him many of the patients [20]. The paper triggered a war of letters in the editorial pages of the Lancet and British Medical Journal in which Stewart seemed to relish taking his opponents repeatedly to task. What most unsettled his colleagues was his willingness to take the same arguments to the public. Over and over Stewart endeared himself to supporters of vaccine victims by providing pithy quotes attacking the vaccine in interviews and the popular press [21,22].

The government judged these concerns serious enough to warrant a series of investigations. Two advisory panels reviewed individual cases (many submitted by the Association of Parents of Vaccine-Damaged Children) and concluded that while some were suggestive, taken as a whole they failed to prove or disprove whether pertussis vaccine caused encephalopathy. The JCVI, in contrast, proposed to quantify the magnitude of possible vaccine risk through epidemiological study. To this end, it launched what would become the most important single investigation to arise from the controversy, the National Childhood Encephalopathy Study (NCES). An enormous case–control study, the NCES identified every child between 2 and 36 months of life hospitalized in England, Scotland, and Wales for acute neurological illness, and assessed whether recent immunization was a risk factor. In 1981, its authors concluded that although pertussis vaccine was associated with an increased risk of
acute neurological illness, the risk appeared to be very low. The relative risk of serious neurological illness occurring within 72 h following DTP immunization was 2.6, translating into an absolute risk of 1 in 111,000. Risk of permanent neurological injury was still lower at 1 in 310,000 [23].

Armed with this data, public health officials finally initiated a major immunization campaign in preparation for a second anticipated epidemic in 1982. This time health officials aggressively sought to educate the public through statements released to television and the media. The Health Minister’s daughter and Prince William himself were both inoculated amidst great publicity [24]. The London 

**Fig. 1. Whooping cough notifications and mortality—England and Wales, 1940–1998.**

Foundation in 1986, marked the denouement of the pertussis controversy. The public was thus treated to the remarkable spectacle of a major pharmaceutical company appealing to the legal rather than medical profession to settle a scientific question [31]. In doing so Wellcome’s defense team, which called most of the expert testimony, took full advantage of the courts’ right to obtain access to all relevant medical records. Its strategy was to take apart the relatively small number of cases that had led the designers of the NCES to conclude that the vaccine could indeed cause long-term neurological damage. It was going back, in other words, from epidemiology to the clinical method, albeit with judges and lawyers. In March 1988, Mr. Justice Stuart Smith delivered judgment that the cases were unconvincing. Of the nine vaccine-associated cases of neurological illness that had allegedly led to permanent disability in previously normal children, none had symptoms beginning in the first 48 h. Indeed, Smith became convinced that there were better explanations than vaccine damage for all of the cases in question. Some did in fact have convincing alternative diagnoses, such as viral encephalitis and Reyes’ syndrome. Others involved infantile spasms, a seizure disorder whose association with DPT immunization had been invalidated in several earlier studies and by 1988 was generally considered spurious. Smith ruled that there was no evidence that the vaccine led to permanent neurological sequelae [32].

By the late-1980s, the long whooping cough vaccine controversy was finally losing momentum. The outbreak of 1985 was smaller in magnitude than either of its immediate predecessors, and by the late-1980s immunization rates against whooping cough had reached their pre-1974 levels. In 1991, a major report from the US Institute of Medicine reviewed the entire medical literature and concluded that the association between pertussis immunization and permanent neurological damage remained unproven [33]. When an efficacious acellular pertussis vaccine finally became available in the mid-1990s, it was adopted in the litigation-conscious United States but not Britain. Whole cell pertussis vaccine, considered far less costly and protected from litigation accounting for the Lovelady decision, continues to be recommended not only by Britain but also by the World Health Organization. Comparatively little debate accompanies its use today.

4. International comparison and analysis

Pertussis vaccine came under fire in many countries during the 1970s and 1980s. In Japan, for example, the government suspended pertussis immunization for infants in February 1975 following two widely publicized deaths purportedly related to vaccine. Though it later re-introduced the immunization at age 2 years, a major whooping cough peaked in 1979, involving 13,000 notified cases and 40 deaths in that year alone. The Japanese responded with the rapid development and deployment of several acellular vaccines in 1981 that appear to have averted a second major outbreak [34,35].
The United States provides another comparison. It largely avoided controversy until a 1982 documentary, \textit{DPT: Vaccine Roulette}, ignited a major wave of negative publicity. Angry parents formed vaccine victim advocacy groups analogous to those in Britain, and enlisted the help of like-minded physicians (notably Robert Mendelsohn) in furthering their cause. Overall, however, the US medical profession remained strongly supportive of continuing the DTP, and there was far less debate in the pages of medical journals than was the case in the United Kingdom. Professional organizations such as the American Academy of Pediatrics and American Medical Association joined the Centers for Disease Control in leading a media counter-campaign of their own \cite{36,37}. Immunization rates in fact never fell significantly. Instead, the chief consequence of the US controversy was a dramatic rise in litigation that soon threatened the nation’s vaccine supply \cite{38}. A series of Congressional hearings culminated in the passage of the National Childhood Vaccine Injury Compensation Act of 1986, which set up a no-fault compensation program for probable vaccine injuries \cite{39,40}. Anti-vaccine groups remained active, eventually expanding their efforts to the Internet. But the legislation did succeed in ending the litigation crisis and taking the spotlight off of pertussis vaccine well before the introduction of acellular pertussis vaccine for infants in 1996.

The British controversy nonetheless stands out in several ways. Unlike its parallels in Japan and the US, it involved a successful revolt of the public (and many general practitioners) against the government advisory boards. It spawned an especially vitriolic debate in the popular and even professional press in comparison to that in many other countries. And its consequences, in the form of not one but two major whooping cough epidemics, were especially severe. What factors were most important in explaining the intensity of the British attack on whooping cough vaccine?

Although this essay confirms that the media played an important role in initiating and promoting the controversy, the significance of its contribution must be qualified. Certainly television and newspaper reports were a critical force propelling the debate from the medical profession to the public arena \cite{41}. It would be wrong, however, to characterize the media as consistently anti-vaccine in tone. The \textit{London Times}, at least, did change the tone of its coverage significantly during the 1982 epidemic, providing extensive coverage of victims of whooping cough rather than of the vaccine. This does not mean that the media was impartial; one cannot over-generalize from the example of the \textit{Times}, and in any case even its coverage reverted to a more negative emphasis after 1982. But it does raise an important observation. Popular media responds to drama, whether in the form of victims of vaccines or epidemics. It serves to reduce the complex kinds of arguments made in medical journals to the level of human interest stories. To its credit, the government recognized this in its publicity campaign in 1982. In addition, it needs to be emphasized that the battle lines in the British pertussis vaccine dispute were drawn not between doctors and the media, but ran right through the medical profession itself. While physician sympathizers have cooperated with anti-vaccine groups in many countries, in this example they appear to have been especially prominent and active. To recapitulate evidence already cited in this paper, they included academic figures (Gordon Stewart and John Wilson) and even a member of the government’s vaccine advisory group (George W. Dick). US physician spokesmen against vaccines (such as Robert Mendelsohn) by contrast tended to relatively peripheral figures cooperating with the popular press but seldom taking their arguments to peer-reviewed journals. British medical publications carried far more letters to the editor regarding the vaccine controversy than did their American counterparts. Finally, surveys of British general practitioners and visiting nurses demonstrated great ambivalence towards pertussis vaccine, which was often deferred for a wide variety of indications. By comparison US physicians were far more supportive, and acted through their professional bodies to maintain confidence by organizing educational campaigns.

It is also wrong to portray the lay public as a passive force manipulated by the media. Parents played an active role on at least two levels. First, the influence of those who joined vaccine injury support groups should not be underestimated. The Association of Parents of Vaccine-Damaged Children furnished cases to the media, helped coordinate efforts in the courts, and advocated for compensation in Parliament. In doing so, it countered the media’s natural short attention span, and succeeded in sustaining the national spotlight on the alleged dangers of vaccination. An interesting (and impossible to answer) question regards whether these parents would have been appeased had compensation legislation been passed in 1979 as originally intended. Rosemary Fox, president of the leading vaccine victim parents’ group, repeatedly stated that she sought compensation legislation, not an end to vaccination \cite{29}. The US experience provides an example where passage of compensation legislation did rapidly curtail litigation and adverse media publicity. Vaccine injury compensation cannot be regarded as a panacea, as made evident by renewed anti-vaccine agitation in the US in recent years despite such legislation. Nonetheless, it seems fair to suggest that the British decision not to provide such legislation in 1979 helped prolong the crisis through the adverse media publicity generated in the courts as late as 1986.

Laypersons also influenced the controversy on a second level, by simply requesting in many cases to defer immunization at the doctor’s office. Why was there so little fear of whooping cough, even after the 1978 epidemic, in comparison to the vaccine? Historically, epidemic diseases that afflict or disable adults, such as polio and meningococcus, have provoked more fear among the public than childhood diseases such as measles or whooping cough. Both of the latter diseases, for example, caused more deaths than did polio.
in the early-20th century, but hardly generated the same degree of apprehension. The potential of whooping cough to be fatal in infants is obscured by its less dangerous (though hardly benign) presentation in older children. Indeed, there is some evidence that in Britain many physicians and laypersons characterized prolonged coughing illnesses as whooping cough, further obscuring the issue. Dick wrote in 1978, at the height of the whooping cough epidemic, that for many general practitioners whooping cough was “a disease with a cough which takes longer to clear up than the ‘usual’ type of respiratory infection of infants and children, which often occurs at night, and is sometimes associated with vomiting” [42]. The degree to which a childhood illness is tolerated as benign, as a “natural” part of growing up, to some extent is cultural. Britain, France, and Germany, to provide another example, have been slower to define measles as a “problem” disease worthy of systematic vaccination than has the United States [43,44].

Against this background of widespread public and medical ambivalence regarding pertussis immunization, one must be careful not to assign excessive blame to the government for not having conducted a more aggressive campaign to promote immunization prior to 1982. It is exceedingly doubtful that such a campaign would have been politically feasible in the 1970s. Moreover, the magnitude of possible danger from pertussis vaccine was truly unknown in 1974. The great problem was that it took almost 7 years, following completion of the NCES in 1981, to answer the question. The more fundamental problem complicating the government’s response prior to that time was the lack of an adequate vaccine adverse effect surveillance system. At any rate, public health officials certainly did take aggressive action once reliable epidemiological data was available.

5. The controversy in historical context

Any hopes that the pertussis vaccine controversy would prove to be an isolated episode on the British medical scene were dashed in 1997 when another routine childhood vaccine, MMR, became the focus of a new debate concerning whether it was linked to autism. The United Kingdom has once again played a central role in defining, promoting, and ultimately exporting this dispute to North America. The two controversies have shared a number of features. In each case, a routine vaccine has been linked to an unexplained yet devastating condition presenting at the same time in infancy or childhood. The MMR allegations have generated fierce debate in medical journals (often on the electronic pages). The physician Andrew Wakefield has acted as medical spokesman in a manner reminiscent of Gordon Stewart 20 years earlier [45]. Anti-vaccine groups have played a yet more prominent role, now assisted by the powerful technology of the Internet. Partly as a result, this controversy crossed the Atlantic to North America far more quickly than did its predecessor [46]. Immunization rates against measles are declining once again, though not as steeply as before with pertussis [47]. From many perspectives history appears to be repeating itself.

Though a number of observers have discerned echoes of the DPT controversy in the current turmoil surrounding MMR, few have noted that contention has been a recurrent theme in the history of British immunizations. To begin with, the British medical profession has long manifested a strong undercurrent of skepticism regarding the efficacy of vaccines, particularly in comparison to their American colleagues. The reasons for this remain to be fully elucidated, but it is notable that many of the early leaders of statistical medicine in Britain (who helped make the United Kingdom an international leader in this regard) seemed to take particular aim at vaccines. Karl Pearson engaged the promoter of typhoid vaccine, Sir Almuth Wright, in a bitter dispute regarding its efficacy in the early-1900s. Bradford Hill later challenged the validity of US clinical trials of diphtheria during the 1930s. And when the MRC embraced the randomized controlled trial after the Second World War, it made pertussis vaccine the object of one of its first and largest studies, despite considerable pressure to adopt the American vaccine. As a result British physicians did not routinely immunize against whooping cough until the late 1950s, over 10 years after the United States had done so. British medical leaders thus questioned the value of pertussis immunization long before the 1970s [48].

The greatest vaccine controversy of all, to be sure, was that surrounding compulsory smallpox vaccination in the late-19th century. Mandatory vaccination represented one of the first intrusions of state public health policy into personal life, and consequently provoked considerable libertarian opposition. This was particularly true among the working classes. Compulsory infant vaccination was first administered by the unpopular Poor Law administration, the institution caricatured by Charles Dickens and despised by workers for its treatment of the destitute in public workhouses. As a result vaccination was associated in the minds of many laborers with other symbols of class oppression. Such resentment repeatedly boiled over in carnival-like public demonstrations, such as that which took place in Leicester in March 1885 featuring a parade with banners carrying anti-vaccine slogans, a hearse bearing a child’s coffin, and the burning of an effigy of Edward Jenner [49]. Yet, by the 1880s many “respectable” middle class individuals joined the movement as well, taming its excesses and carrying its message to Parliament. A number of prominent physicians, most notably Dr. Charles Creighton and Dr. Edgar Crookshank, played central roles in anti-vaccination organizations. Tracts and pamphlets proliferated. All of this agitation ultimately proved highly successful, for by the early-1900s Parliament allowed conscientious objection to mandatory vaccination and smallpox vaccination coverage fell from over 95 to under 50% [50,51]. Anti-vaccinationists remained powerful well into the 20th century, where they were instrumental in delaying the introduction of
diphtheria immunization to Britain in comparison to the US and Canada [52].

The main legacy of the smallpox vaccination controversies of the 19th and early-20th century in Britain has been the decisive rejection of compulsory vaccination as a strategy to combat childhood illness. As a result, the use of school entry requirements to establish immunization levels that have been very powerful in the United States, remains politically untenable in the United Kingdom. This factor alone may be critical in explaining why MMR rates have dropped more in Britain than in the US. It should be added that British vaccine leaders have been extraordinarily inventive in developing other approaches to maintaining high immunization levels (such as incentives to providers), which may help explain why MMR immunization rates have not dropped still further.

Predicting the future is a risky art, one whose limitations are best appreciated by those who have tried to grapple with the complexities of the past. It may still be suggested that we are entering an era of “globalization” with regard to vaccine policies and their associated controversies, and that in the future there may be fewer distinctions between how different developed countries prioritize and support childhood immunization. From this perspective, the recent rise of anti-vaccine sentiment in the United States can be understood to some extent as an importation of cultural attitudes from Great Britain (and perhaps western Europe) expressing ambivalence if not suspicion towards childhood immunization. A greater awareness of the historical experiences of different countries with regards to vaccines nonetheless seems prudent for those who hope to optimize their potential for the future.

References


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