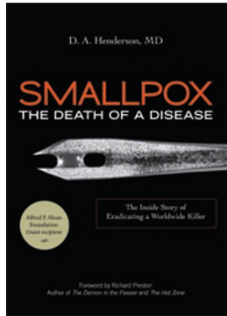


Smallpox outfoxed



Smallpox—The Death of a Disease: The Inside Story of Eradicating a Worldwide Killer

D.A. Henderson

Prometheus Books, 2009
288 pp., hardcover, \$27.98
ISBN: 1591027225

Reviewed by Ellen G Strauss

The global eradication of smallpox has been rightly called the “greatest life-saving achievement in the history of medicine,” as pointed out by Richard Preston in the foreword to the new book *Smallpox—The Death of a Disease: The Inside Story of Eradicating a Worldwide Killer*. This personal account of the eradication effort, written by its director Donald A. Henderson, provides insight into the challenges of this crucial endeavor. Indeed, throughout history, smallpox has been a much feared plague; it was once extremely widespread, and three out of every ten of those infected died a painful death, with the survivors disfigured for life by the scars from the ‘pocks’. At the time the eradication campaign was initiated in 1967, smallpox was still endemic in 31 countries, and it was still causing horrifying outbreaks due to imported cases in 12 more; the program concluded a mere nine years later with the last case of naturally acquired smallpox on October 21, 1976 in Somalia. The official account of the eradication project was a ponderous tome (1,500 pages), entitled *Smallpox and its Eradication* but widely known unofficially as The Big Red Book, that was published by the World Health Organization in 1988 and is currently out of print. Now, Henderson has written a much pithier and more engaging account that not only covers his involvement as director of the eradication effort from 1966 to 1977 but also includes a thoughtful discussion of new issues arising in the post-smallpox, post-9/11 world.

As summarized by Henderson, virologists had considered smallpox (caused by the variola virus) to be a promising candidate for worldwide eradication from the beginning. First of all, it is a viral disease exclusively of humans, with no known animal reservoir, which is spread solely by person-to-person contact. Second, the vaccine is a naturally occurring close relative of variola known as vaccinia, or cowpox, discovered by Edward Jenner in 1796, that confers solid immunity to smallpox for at least ten years and that had been in use for decades. Third, there are no asymptomatic infections—every victim develops the characteristic rash, which evolves into pustules (pocks) and eventually scars. Similarly, successful vaccination creates a pock at the site of inoculation, which also produces a scar. Thus, ‘scar surveys’ could accurately assess the incidence of smallpox (both naturally acquired or from variolation) as

well as gauge the efficiency of vaccination efforts, even in regions where governments were attempting to hide the presence of the disease.

That being said, the success of the operation, as Henderson so clearly describes, was never a ‘slam-dunk’, primarily owing to conditions in many of the endemic countries, where fear, inadequate infrastructure, government corruption, war and insurrection, mass migrations of refugees from both man-made and natural disasters, and chronically insufficient funds brought daily headaches. Moreover, in the beginning, many high-ranking officials doubted that worldwide eradication was possible, owing to the conditions listed above, especially after the collapse of a similar initiative to eradicate malaria, and they were uncooperative and in some cases even hostile to the project, believing that funds would be better used for other health initiatives. Ultimately, it was a mixture of determination, diplomacy, guile, begging and borrowing and a generous dollop of serendipity that enabled the program to lurch forward. One of the enduring legacies is the concept of surveillance and containment of cases accompanied by ‘ring’ vaccination of people who came into contact with infected individuals, which augmented the previous regimes of sporadic mass vaccinations. Surveillance and containment were especially important in dealing with the independent small outbreaks that popped up in the late stages of the eradication effort. Additionally, we should not overlook the importance of the reporting and documentation of cases by scar surveys and the use of the ‘smallpox clinical recognition card’. This laminated card showed photos of a child on the eighth day of rash. In villages, these cards were routinely shown at schools, as seven- to twelve-year-olds seemed to know everything happening in their villages. In addition, the commitment and dedication of a small core of World Health Organization personnel who directed the armies of local assistants was exemplary.

After the end of the program, as discussed in this book for the first time in a comprehensive fashion, it was crucial to establish criteria for certifying eradication and to address the problem of disposing of the existing stocks of variola in laboratories and repositories. Such policies are still being actively debated, especially after the discovery in 2005 that the Soviets had ‘weaponized’ smallpox in 1971 and had a five-year plan during 1986–1990 to manufacture tons of the virus for use in biological warfare. Indeed, the possibility that smallpox could be used as a weapon of bioterrorism is still with us, and those who read this book will have a greater understanding of why this is so.

The main text follows the chronology of the eradication campaign by regions, with numerous sidebars containing more anecdotal information. This account will stand as a cautionary tale for all who would embark upon an eradication campaign for one of the other current global scourges, such as polio, measles, malaria, tuberculosis or HIV. And although Henderson may have angered some bureaucrats with his descriptions of government intransigence, this is a factual rather than malicious retelling of a very important story. Finally, the bibliography is complete and will augment some aspects that have had to be condensed. The only weakness is the lack of an index.

Overall, this is a very informative and, at times, provocative book. It is a page-turner, eminently readable by experts and laypersons alike, and it should be required reading for all those in the sphere of public health.

Ellen G. Strauss is Senior Research Associate Emeritus at the Division of Biology, California Institute of Technology, Pasadena, California, USA.
e-mail: strausse@caltech.edu