

Age Distribution of Patients in Endemic Smallpox

PART II

BY

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During the recent epidemic of smallpox in the Abercorn district of Zambia it was noted that with only three exceptions all the patients were children. Most of the patients were young children below the age of five years. Where other epidemics occurring in this region have been described, and where the age distribution has been noted, a similar preponderance of child patients has obtained. Mowat Sword, describing a smallpox epidemic in Nyasaland in 1960, found that 90.7 per cent. of his patients were children below the age of 10 (Mowat Sword, 1961). Similarly, Conacher, describing an epidemic of variola minor in Southern Tanganyika in 1953, found that 418 out of 492 patients were below 10 years old (Conacher, 1957). Of an epidemic in Zambia in 1955 it was noted that children were more commonly affected; of an epidemic in Nyasaland in 1930 it was noted "infants and young children have been largely affected in this epidemic"; and of an epidemic in Marandellas, Southern Rhodesia, in 1923 that it was almost entirely confined to unvaccinated children and young infants.

This age distribution is in marked contrast to the age distributions found in other epidemics in other countries. In New York in 1930, out of 100 patients only 29 were children, and the average age of the patients was 30. In Glasgow in 1942, out of 16 patients only four were younger than 15 years old. In Tilburg, Netherlands, in 1951, out of 23 cases, only three were children. In Staffordshire in 1947, out of 30 cases only two were below the age of 10.

It would be erroneous to conclude from these figures that it is the rule that only children are affected by smallpox in Central Africa. The early descriptions of smallpox by the first explorers and the description by Theal of the epidemic in Cape Town in 1713 indicate that in these times adults were affected as frequently as children.

The history of smallpox in England provides an insight into the reason for the unusual age distribution in Central Africa. In Tudor and Stuart times smallpox was not confined to child-

ren. In the eighteenth century, however, there was an age incidence comparable to that in Central Africa at the present time. The report of the Royal Commission on vaccination, published in 1897, investigated the age distribution of patients in the eighteenth and nineteenth centuries. In Chester in 1774, for example, all of the 202 deaths from smallpox were in children under 10 years old. Similarly, in Warrington in 1773, all the deaths were in children under nine years old; and in Edinburgh, during the years 1764-83, the proportion of deaths from smallpox of those below the age of 10 years, to every 1,000 deaths from that disease at all ages, was 993.

Edward Jenner published his *Inquiry into the Causes and Effects of Variolae and Vaccinae* in the summer of the year 1798. During the early part of the nineteenth century some vaccinations in England and Wales were performed privately by doctors. Vaccination was not made compulsory in England and Wales until 1853.

At the time when vaccination was made compulsory, out of every 1,000 deaths from smallpox in England and Wales, 807 were in children under the age of 10 years. In 1890-94, after nearly half a century of compulsory vaccination, out of every 1,000 deaths from smallpox, only 333 were in children below the age of 10 years. Compulsory vaccination had gradually transformed the epidemiological picture of smallpox from being a disease in which mainly children were affected into one in which all age groups were affected. At the same time there had been a gradual decline in the overall mortality from smallpox.

Thus in England smallpox was a disease which affected all ages in Tudor and Stuart times, affected mainly children in the eighteenth century, and has now reverted to its original age distribution, thanks to the effects of vaccination.

Where smallpox is endemic it affects mainly children, people by and large acquiring their immunity to the disease not by vaccination, but by exposure to previous epidemics. Where smallpox is rarely epidemic, all age groups are affected.

Lest it should be thought that these facts constitute a condemnation of the Northern Rhodesia Health Services, whose vaccination campaigns have been energetic, it should be remembered that the epidemiological picture in England was only slowly transformed over a period of 40 years. Moreover, not only were many of the

villages in Northern Rhodesia extremely inaccessible, the hostility or indifference of their inhabitants to vaccination was in marked contrast to the eagerness with which vaccination was sought in more developed countries.

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