

SUMMARY - SURVEILLANCE

D. A. Henderson ¹

In the global eradication programme the most difficult concept to convey has been that of surveillance - how it may be conducted, why it is important, what it can accomplish. In countries in this area of the world, the concept has been better appreciated than in most. But even here, there is room for improvement as I believe the discussions have brought out.

Most important, I sense that all have not yet fully appreciated the concept that there is no such thing as a single case of smallpox or a small outbreak which develops spontaneously without relationship to other cases or other outbreaks. Perhaps this is understandable. In most diseases, there are moderate or large numbers of subclinical infections. Infection is transmitted from one area to another, from one person to another for some period - suddenly, there are a number of clinical illnesses. How or by whom the disease was introduced is usually a mystery and frequently the best epidemiologist with the most elaborate studies cannot provide the answer. Such is the case with poliomyelitis, typhoid fever, diphtheria, and, in fact, most other infections. Such is not the case with smallpox. Subclinical infections play no role in transmission of smallpox. In this respect, smallpox is almost unique among the infectious diseases. When one case is detected, it is a certainty that this person acquired the disease from someone else with overt, clinical disease. It is vital that this person be identified and containment measures taken and that the source of infection of the previous case be investigated and so on. Whether or not this chain of transmission can be traced back to other known sources depends on the persistence, imagination and diligence of the investigator - it is quite clear, however, that in the great majority of cases, the source of infection can be traced back over many generations.

All of you appreciate fully how very incomplete the reporting of smallpox was at the beginning of the programme. Scar surveys conducted in various countries have shown that at the inception of programmes, rarely more than 5% to 10% of cases were recorded. As the programmes have progressed, reporting has improved and at the same time, the incidence has fallen. One would like to know, as time progresses, how much improvement has been made in the completeness of reporting. Unfortunately (or fortunately) the number of cases normally decreases rapidly when an effective programme is conducted. Within a period of only a year or two, the number of cases in any large area has declined to such low levels that a scar survey which would include enough people to permit another estimate to be made would require examination of such large numbers as to be prohibitive in time and cost. However, as the discussions have brought out, there is an alternative and, I believe, satisfactory way to determine progress in reporting in the course of the programme. By comparing each month the total of cases reported to the total number finally detected after field investigation, one should observe a trend in which an even larger proportion of cases is reported through the notification network. As brought out particularly by data from Northern Nigeria, not only do the officially notified cases account for an increasingly larger proportion of the total but the average number of cases in each outbreak progressively declines. This, of course, reflects earlier notification. In most areas, however, I doubt that much more than 50% of cases can be expected to be reported through official channels. In other words, at least one additional case will be found on investigation for each case reported. When this

¹Chief, Smallpox Eradication Unit, WHO, Geneva

point is reached, the disease incidence should be at very low levels. The final test of efficacy of the system may then be employed. Specifically, every outbreak reported should be carefully studied in an effort to trace it back specifically to previously known cases. When all outbreaks in a country can be specifically traced in this manner, a smallpox-free status should not be more than months away.