

From: Chief, Smallpox Eradication

20 July 1973

To: Smallpox Staff

SUBJECT: Target Zero - Progress Report 11

1.0 Overview

With the advent of the summer season, smallpox incidence in Bangladesh and India has at last begun to decrease sharply and, hopefully, the same will soon be observed in Ethiopia and Pakistan. To public health administrators and epidemiologists alike, a declining curve of incidence is both reassuring and almost certain to breed a degree of unwarranted optimism. In India, for example, the total of cases in June will be approximately half or even less of the total recorded in May - but, even so, the total of cases recorded in June will almost certainly be greater than that recorded during any single month during the five year period 1968 - 1972. Thus, however reassuring the decline in incidence, it is abundantly clear that in each of the four endemic countries, the endemic foci still persisting are both numerous and geographically extensive. Unless there is a continuing, concerted effort throughout the summer to identify and eliminate these, the task for this autumn may well be too great to permit a nil incidence to be achieved during the coming season.

It is gratifying to report that plans for a special "autumn campaign" are now well-advanced in India although procedural and administrative delays still could damage or destroy its effectiveness. Additional WHO and Indian staff will assist in a scheme involving for one week periods in October, November and December all health staff in the four problem states of Bihar, Uttar Pradesh, Madhya Pradesh and West Bengal. These states together have accounted for more than 93% of all cases in India this year. During a one week period each month, health staff in each of the four states will conduct a state-wide village by village search to identify residual smallpox foci which will then be immediately contained. As this is the low season in incidence, it is believed that foci will be limited in number and extent and, by containing these at this time, the number of smallpox cases during the next season could be sufficiently reduced to permit transmission to be interrupted during the following 6 to 12 month period. In the meantime, a "non-endemic" area team will coordinate activities to eliminate the now limited number of foci persisting outside these states and to clearly document all other cases as being due to importations. If the overall scheme is successful, it is believed that smallpox incidence in December and January could be maintained at a level of less than 1 600 cases each month and the stage then would be set for a final drive in the spring.

Additional staff as well as transport are also being provided to Bangladesh and Pakistan to permit similarly intensified campaigns. In Ethiopia, with the progressive reduction in size of the endemic areas, more staff are gradually being shifted to provide greater support where residual foci persist; an intensive campaign will also be launched in these areas this autumn with surveillance teams stationed in all awrajas (districts) of the infected states.

In brief, this is the year for the all-out attack on smallpox. With luck and a great deal of hard work, I would hope that a nil incidence would be reached in 3 of the 4 countries by May and in all, by December 1974.

2.0 Targets - for end December 1973 - remaining endemic areas

The importance of gradually restricting smallpox to ever-smaller areas has been repeatedly demonstrated to be the most effective strategy in the global campaign. The targets set forth in the previous report (10) and restated below should therefore be kept in view as we move into the late summer and autumn.

Ethiopia - Begemdir and Gojjam Provinces

India - Uttar Pradesh, Bihar and West Bengal States

Bangladesh - Dacca, Faridpur, Barisal, Jessore, Khulna, Kushtia, Patuakhali, Rajshahi, Dinajpur, Rangpur, and Bogra Districts

Pakistan - Sukkur, Nawabshah, Khairpur and Larkana Districts. As shown under section 4.0, 83% of all cases in April, May and June occurred in these areas or could be clearly attributed directly or indirectly to importations. This percentage should steadily rise as the year goes on.

3.0 Diagnosis of problem cases of smallpox

A word or two should be said about the diagnosis of the difficult suspect smallpox cases in smallpox-free countries or areas of a country. From reports, it is clear that miscellaneous problems have been experienced which should be solvable if certain basic principles are kept in mind.

1. Proper diagnosis in the laboratory requires that sufficient material be collected (i.e. at least 6 crusts or material from 6 pustules). An unusually large number of specimens are being received in the WHO Reference laboratories in which the amount of material has been so small as to preclude proper diagnosis. In general, such specimens have been received from countries which have not insisted on the fundamental principle that specimens should be collected only by trained state or national level surveillance staff. If a case in an otherwise smallpox-free area is sufficiently suspect to require that laboratory specimens be obtained, it would seem obvious that clinical and epidemiological investigations should be conducted by an experienced surveillance team and the specimens collected by them.

2. Correct diagnosis requires that the clinical, epidemiological and laboratory observations all be duly considered - If there is strong clinical and epidemiological evidence that a case is smallpox but poxvirus particles are not seen by electron microscopy and no virus is isolated, one must still assume the case is smallpox. Under the best of circumstances, there are failures in the laboratory to detect variola virus in some cases. This does not rule out the diagnosis.

Conversely (and this has now occurred on two occasions), clinical and epidemiological evidence has strongly indicated the case to be chickenpox but the laboratory has reported the isolation of variola virus. Serum specimens were taken to resolve the problem and confirmed indeed that the diagnosis was chickenpox - in both instances laboratory cross-contamination had occurred.

Laboratory examination provides assistance in diagnosis but it does not provide the definitive answer. It is for this reason that trained surveillance teams must, in all instances, undertake both clinical and epidemiological evaluation of each suspect case.

3. Vaccination as a diagnostic procedure

All too frequently forgotten is the fact that vaccination of the suspect case and examination of the vaccination response seven days later may provide additional, if not definitive, information.

If the patient has a major reaction on day 7, the illness was definitively not caused by a poxvirus. Recent observations with the now more potent vaccines indicates that persons who have experienced smallpox will show no evidence of a major reaction following vaccination for at least a year afterwards.

If the patient has an equivocal reaction on day 7 (i.e. no induration and inflammation), there may be several explanations:

- 1) the patient has recently experienced smallpox
- 2) the patient has a high level of immunity induced by vaccination (virtually all who have not been vaccinated for 5 years or more will show a major reaction with present vaccines as well as a large proportion of those vaccinated as recently as one to two years before)
- 3) the vaccine employed was not potent or the technique was not satisfactory. This may be easily checked, however. If, at the same time the suspect case is vaccinated several others are vaccinated, one has a "control" of sorts which may permit this variable to be evaluated.

| <u>4.0 Target Areas - December 31</u> | <u>April</u> | <u>May</u> | <u>June</u> |
|--|---------------|---------------|--------------|
| <u>4.1 Cases occurring within December 31 target area</u> | | | |
| Bangladesh | 4 949 | 3 384 | 1 575 |
| Ethiopia | 301 | 272 | 46 |
| India | 7 950 | 12 262 | 4 576 |
| Pakistan | 404 | 592 | 382 |
| <u>Cases occurring outside target area but specifically traced to importations</u> | | | |
| Afghanistan | 13 | - | - |
| Ethiopia | - | 1 | - |
| India | 312 | 152 | 175 |
| Nepal | 13 | 52 | 31 |
| Pakistan | - | 25 | - |
| United Kingdom | 1 | - | - |
| Somalia | - | 1 | 3 |
| <u>Total of all cases in category 4.1</u> | <u>13 943</u> | <u>16 741</u> | <u>6 788</u> |
| <u>Per cent of world total cases in category 4.1</u> | <u>85%</u> | <u>84%</u> | <u>79%</u> |
| <u>4.2 Cases occurring outside target area</u> | | | |
| Bangladesh | 870 | 758 | 298 |
| Botswana | 4 | - | - |
| Ethiopia | 538 | 333 | 237 |
| India | 786 | 1 148 | 553 |
| Pakistan | 355 | 944 | 747 |
| <u>Total all cases in category 4.2</u> | <u>2 553</u> | <u>3 183</u> | <u>1 835</u> |
| <u>Per cent of all cases in category 4.2</u> | <u>15%</u> | <u>16%</u> | <u>21%</u> |

Note: Data as of 17 July 1973

5.0 Reporting

As of 17 July, reports should have been received from all areas through week 27. Reports, however, are not complete from three countries, a notably poorer record than has been achieved in recent months. Areas which are deficient are as follows:

| | <u>Weeks in Arrears</u> |
|----------------------------|-------------------------|
| Bangladesh (all divisions) | 2 |
| Pakistan | |
| NWFP | 1 |
| Punjab | 1 |
| India | |
| Andhra Pradesh | 2 |
| Arunachal Pradesh | 1 |
| Assam | 3 |
| Bihar | 2 |
| Chandigarh | 2 |
| Delhi | 2 |
| Goa | 3 |
| Haryana | 2 |
| Himachal Pradesh | 5 |
| Jammu & Kashmir | 4 |
| Kerala | 3 |
| Madhya Pradesh | 2 |
| Manipur | 2 |
| Meghalaya | 1 |
| Nagaland | 4 |
| Punjab | 1 |
| Tripura | 1 |

By any standard, this is an unsatisfactory situation which undoubtedly will further deteriorate unless active measures are taken.