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THE SPECIAL PROGRAMME TO CONFIRM SMALLPOX ERADICATION IN IRAN

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1. Introduction

In the recommendations of the Consultation on Worldwide Certification of Smallpox Eradication, convened in Geneva 11 - 13 October 1977, Iran was included in a group of five countries which were considered to require "visits by Global Commission members or consultants and/or WHO staff...to verify and document smallpox eradication status...." The other countries in this group are Iraq, Syria, Thailand and China.

The requirements for preparing for certification are given in WHO document WHO/SME/78.6 "Methodology for Preparation of Appropriate Data for the 31 Countries Remaining to be Certified Free of Smallpox". The specific recommendations for Iran included governmental/WHO preparation of a "minimum information document" as well as pockmark surveys in priority areas and additional special surveys in high risk areas. Laboratory specimens were to be taken only from suspected smallpox cases.

In view of the history of smallpox in Iran, the Ministry of Health felt it advisable to undertake during six months a "Special Operation for Confirmation of Eradication" from March 21 - September 23, 1978. This programme consisted of manditory reporting of all chickenpox cases, systematic collection of specimens from chickenpox cases for laboratory confirmation, and a large-scale pockmark survey. The purpose of my visit was to assist in the organization and analysis of this special programme and to help the Government prepare the documentation required for Certification.

2. Activities

The main activities undertaken during my visit were related to analysis of the pockmark survey data, the efficacy of chickenpox surveillance, and the investigation of suspected smallpox cases. In addition, a short field trip to Fars and Isfahan ostands (provinces) was made to assess documentation at provincial level and to visit persons with pockmarks where the etiology of the scars was unclear.

2.1 Discussions

Discussions were held with Dr. N. Fakhar, Deputy Minister for Public Health in the Ministry of Health, Dr. B. Hirmand, Director-General of Malaria Eradication and Communicable Disease Control and Dr. P. Rezai, Deputy Director-General of Malaria Eradication and Communicable Disease Control. Dr. Ehsan Shafa (WHO Geneva) was also present. These discussions centred around the documentation, and the itinerary and dates of arrival for the Global Commission members scheduled to visit the country later in the month.

2.2 Documents

Along with Dr. Rezai and Dr. Shafa, the detailed country report "Smallpox Eradication in Iran" WHO/SE/78.120 was prepared. This document reviews country background, history and epidemiology of smallpox in Iran, and maintenance activities as well as the results of the special programme for certification of eradication. The major portion of my visit was spent analysing the results of this special programme.

2.3 The Special Programme to Confirm Eradication in Iran

The Government of Iran undertook one of the most ambitious country efforts to confirm the absence of smallpox. There were three components to this special programme:

(1) chickenpox surveillance

(2) special investigations of "suspected smallpox" cases

(3) a national facial scar survey

2.3.1 Chickenpox Surveillance

In the six month programme, 4074 cases of chickenpox were reported. The incidence rate of 12.2 per 100,000 population compares reasonably with other countries reporting chickenpox incidence in preparation for certification. However, the reported incidence of chickenpox was not uniform among the ostands, and the range which extended from a low of 0.46 cases per 100,000 in Kerman to a high of 53.28 in Ilam seems an artifact of the reporting system rather than a genuine difference in the incidence of the disease. Three thousand five hundred and seventy-five of the reported 4074 cases (87.7%) were epidemiologically analysed; most ostands were able to analyse all cases, but six provinces failed to complete their investigations, with the worst performance being in Ilam province which neither investigated nor confirmed any of the very many reported cases in that province. The incidence of disease showed the expected seasonal peak in May, falling rapidly to the lowest levels in September. From provincial data available, it was clear that this seasonal pattern was relatively consistent throughout the nation. Most of the chickenpox cases (85.2%) had been vaccinated against smallpox, and nearly all (98%) occurred in children less that 15 years old. The health services were able to take laboratory specimens from a large percentage (45.5%) of the unvaccinated cases. These 209 specimens came from every ostand except three (Kerman, Ilam, and Lorestan). While all were negative for smallpox, two were reported by WHO Reference Laboratories as "poxvirus" leading to special investigations as described below.

2.3.2 Special Investigations

The chickenpox surveillance programme resulted in detection of several unusual cases of smallpox-like disease in Iran. These cases are well described in section 10 of the document "Smallpox Eradication in Iran" (WHO/SE/78.120). It should be noted that government health workers responded rapidly to the report by WHO that two cases were confirmed by electron microscopy as "poxvirus". This demonstrates the ability of the health service to respond to reports of smallpox. That these two cases were later shown to be "molluscum contagiosum" is further evidence of the capacity of the surveillance system to reveal unusual cases of pox-like disease. An additional case, a death due to hemorrhagic chickenpox in an Indian dentist from Kerala state, was a tragic reminder that chickenpox is not an innocuous disease in adults. This death, the only reported death from chickenpox in the country, raised widespread concern in Iran. A detailed work-up of the case was done in an attempt to discover why this community of South Indians has such an unusually high death rate from chickenpox. These investigations were thorough and well planned and are reported in detail in the Iran "country report".

2.3.3 Facial Pockmark Survey

This element of the special programme was the most well designed and persuasive component of the effort to confirm eradication. One thousand six hundred and thirty-five villages (2.2% of the nations total) were visited by specially trained health workers who scrutinized the faces of 72,337 children under the age of five, thus examining more than 1.2% of all under-five children in the country. The sample was designed not as a probability sample of the country per se, but with an emphasis on visiting high risk villages. These villages were selected either because they had smallpox in 1970 - 1972, or because their geographical location made them likely repositories of the disease. The survey was conducted in all 23 ostands, and in 160 of the 162 shahrestans (districts) in the country. Fifteen children were located with pockmarks conforming to the criterion of "five of more depressed facial scars more than 2 mm at the base". These 15 children were visited by senior medical officers, and efforts were made to reconstruct the cause of scarring. In nine cases, a diagnosis of chickenpox was made, while three were due to boils, and one was thought to be deep scarring resulting from secondary infection of chickenpox vesicles. One child, reported by a health worker to have pockmarks due to chickenpox, left his village before the diagnosis was confirmed by a senior physician and was still under investigation at the time I left Iran.

3. Field Visits

Field visits were felt needed in two areas: Ilam province, which had done the poorest chickenpox surveillance, and Fars and Isfahan provinces where there were high numbers of pockmarked children for whom the diagnoses were doubtful. While Dr. Shafa visited Ilam, I made a field visit to Fars and Isfahan to examine these children with facial scars, and assess the overall performance of the scar survey. Annex 1 shows the location of these provinces.

Fars Province: I visited Fars on October 25. Due to the political situation my visit was less extensive than might have been prefered. I was able to carefully review records at the provincial level, however, and these were excellent. The facial pockmark survey was well designed, the sampling frame carefully chosen to include all villages known or suspected to have had smallpox within the last ten years. I accompanied two workers to several villages and saw that they knew the field survey procedures quite well. In addition, I visited Bidzardsofla village in Gharabagh within Shiraz shahrestan and found Samanbar Nejat (case number 14 in the Iran "country report") a five year old child whose scars were clearly due to a superficial bacterial infection two or three years ago. The scars were on his forehead only, near the hairline, and there was no possibility that they were due to smallpox.

Isfahan Province: I visited Isfahan Province on 26 October. Due to the political situation it was possible to visit only one village, Keshecheh village in Isfahan shahrestan. A five year old child, Mohammed Mazaheri (case number 9) had been detected with facial scars during the survey. This child was vaccinated, and the superficial scars on his forehead and cheeks were determined by the history and physical examination, to be the result of boils.

4. Conclusions

Smallpox in Iran ceased to be an endemic disease in 1962 - 1963. Subsequently, importations from neighboring countries brought the disease back to the country in 1970 - 1972 in epidemics which were under-reported. In an effort to clearly confirm that smallpox had not been present in the country in the last five years, the government launched an intensive six month programme to confirm the absence of the disease. This programme has been extremely well conceived, and admirably executed. Not only have nearly 90% of all reported chickenpox cases been visited by a physician for confirmation, but in addition, laboratory samples have been taken from nearly half of all unvaccinated chickenpox cases. Further, the number (349) of laboratory specimens examined and found to be free of variola virus and the geographical distribution of these specimens all over the country lend

additional strength to the claim of eradication. Although the political situation in Iran made it impossible to carry out the methodical field visits that Commission members may later be able to conduct, the few places that I was able to visit displayed a thorough and comprehensive knowledge of the methodology of certification and the field work, especially the pockmark survey, appeared to be very well conducted. No evidence of smallpox transmission was discovered in any areas visited, and with the exception of Ilam province, no area seemed to have been negligent in the performance of the confirmation programme.

5. Acknowledgements

The Consultant is extremely grateful for the kindness, cooperation and courtesy shown by the staff of the Ministry of Public Health. In particular, Dr. P. Rezai was extremely helpful and showed an exceptional interest in the programme and an ability to carry out the "special programme" with meticulous attention to detail. Dr. Ehsan Shafa (WHO Geneva) who assisted the government in the preparation of the plan for the "special programme" was responsible for the design of an extremely useful and innovative methodology to confirm eradication, and I hope that some of the components of this methodology are later used by other countries requiring certification. I would also like to express my deep personal gratitude to many of the Iranian field staff who, during difficult circumstances, were exceptionally kind and generous hosts.

ANNEX 1 Map of Iran Showing Provinces Visited or Mentioned in Report