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REPORT OF THE INTERNATIONAL COMMISSION FOR THE CERTIFICATION OF SMALLPOX ERADICATION IN THE SUDAN

15-29 November 1978

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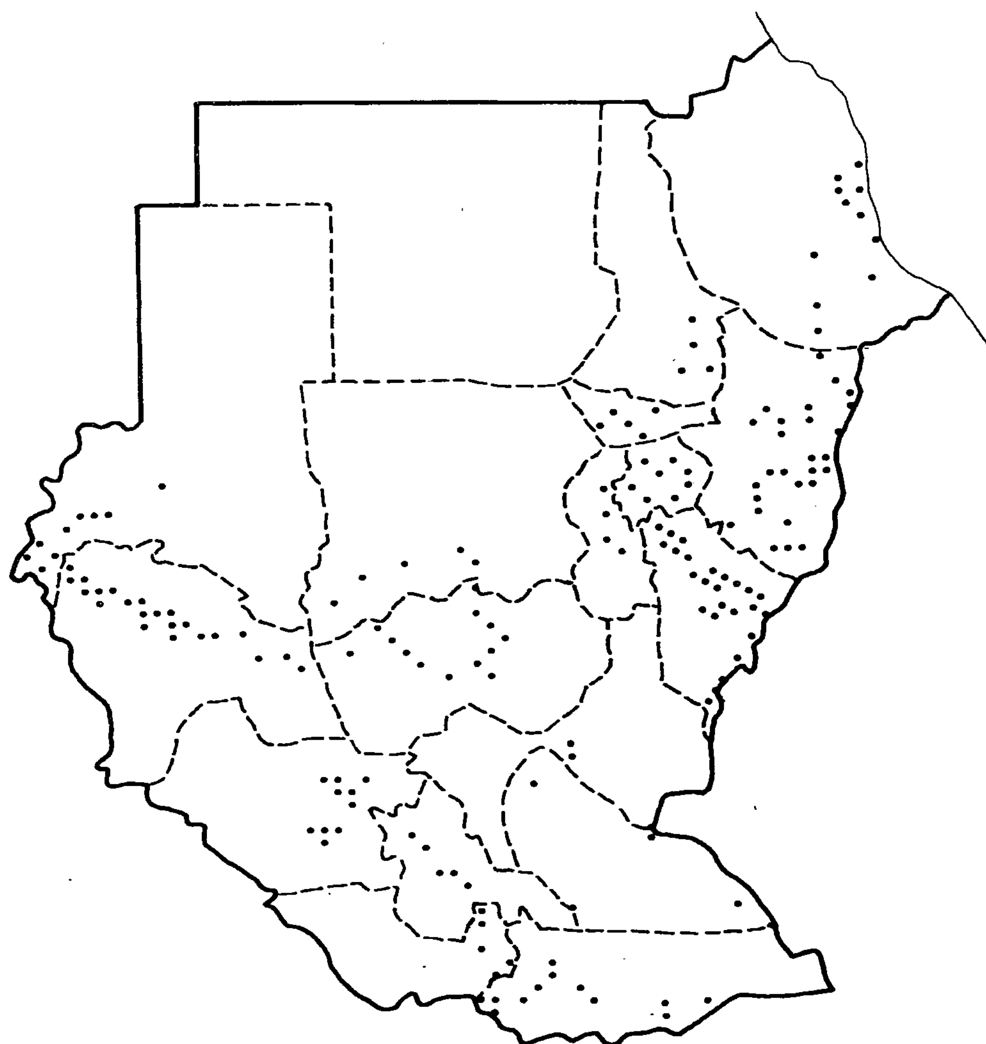
LOCALITIES VISITED BY MEMBERS OF THE INTERNATIONAL COMMISSION
FOR THE CERTIFICATION OF SMALLPOX ERADICATION IN THE SUDAN



1. Conclusions

After detailed consideration of all information available on the Smallpox Eradication Programme in Sudan, members of the Commission conducted independent field investigations. These investigations included study of information available in all the provinces and discussions with provincial smallpox eradication programme (SEP) workers.

After completion and review of the information obtained from these visits the Commission concluded that:

1. There is no evidence that endemic transmission or importation of smallpox has occurred in any part of Sudan since December 1972.

2. Surveillance activities in the period since 1972 have been adequate to detect any cases that might have occurred.

3. The requirements for smallpox eradication, as established by the WHO Expert Committee on Smallpox Eradication, 1971, have been fully met. The eradication of smallpox from the Democratic Republic of Sudan is considered to have been achieved.

2. Recommendations

In formulating these recommendations the Commission took note of the fact that smallpox transmission was known to have continued in nearby parts of Africa until October 1977.

2.1 Surveillance for smallpox and primary vaccination should continue along the eastern border, including Red Sea Province, at least until eradication has been certified in the remaining countries of Africa.

2.2 Primary vaccination of children should be continued until the global eradication of smallpox has been certified.

2.3 Vaccination certificates for smallpox should be required only for those travellers who have been in a smallpox infected area within the previous 14 days. Smallpox is not known to be endemic in any country at this time.

2.4 Although all available evidence indicates that monkeypox virus does not constitute a threat to smallpox eradication, there are areas in Sudan which are ecologically similar to those where human monkeypox cases have occurred. These cases have been clinically indistinguishable from smallpox. Health authorities in Sudan, therefore, should be aware of the possibility of occurrence of monkeypox.

2.5 The system for the notification of chickenpox and other communicable disease should be strengthened. Any case suspected of being smallpox should immediately be investigated and contained pending results of laboratory investigations.

2.6 The considerable skill and field expertise of the SEP staff should be recognized as a valuable national asset and used to the fullest extent in the development of other health programmes.

3. First Khartoum Meeting (15-16 November 1978)

3.1 Introduction

The meeting was opened by Dr Rafique-Khan, WHO Programme Coordinator, Sudan, who provided a brief historical review of the Smallpox Eradication Programme. He then read a message from the Regional Director, Eastern Mediterranean Regional Office. Dr Shakir Mousa, Deputy Under Secretary for Health welcomed the Commission (members of the Commission are listed in Annex I).

The Commission unanimously elected Dr A. M. Fergany as Chairman, Dr C. Lerche as Vice-Chairman and Dr G. Meiklejohn as Rapporteur. Dr J. G. Breman was appointed Secretary to the Commission and a working programme was adopted.

3.2 Current status of global eradication programme

The current status of the programme was reviewed by Dr Breman. With the exception of the laboratory associated outbreak in England no cases had been reported in the world since October 1977. The problems posed by monkeypox and whitepox viruses were discussed and the need for continuing surveillance and research was stressed.

3.3 The Global Commission for the Certification of Smallpox Eradication

The methodology to be used in certification of the remaining countries was presented by Dr Koinange-Karuga. The countries have been divided into three categories:

Group I	Countries requiring formal certification by an International Commission
Group II	Countries requiring visits by Global Commission members
Group III	Countries required to submit detailed reports.

The Global Commission will meet in Geneva in December 1978.

3.4 Criteria and requirements for certification of eradication of smallpox

Smallpox eradication is defined according to the criteria established by the Expert Committee in 1971. Over the last six years procedures have been developed for certifying smallpox eradication in different countries. If the criteria are met eradication can be certified. If eradication cannot be certified, the Commission must cite specific reasons for the decision and outline the steps which should be undertaken by the country concerned in order that it may achieve certification.

3.5 The eradication of smallpox in Sudan

The documents describing the history and work of the Smallpox Eradication Programme in Sudan were presented by Dr A. Hamid Sayed Osman, Director, Smallpox Eradication Programme, Ministry of Health, and SEP staff, and were discussed by members of the Commission. The special problem created by Sudan's proximity to Ethiopia, where smallpox transmission continued until 1976, received special attention. Ato Yemani provided a most helpful review of eradication and surveillance activities in those provinces of Ethiopia which border Sudan.

3.6 Planning for field visits

To facilitate travel to and from six of the provinces, an aeroplane was made available by the United Nations Development Programme.

Commission members reviewed available data for the provinces to which they were assigned with the Sudanese counterparts who were to accompany them. The composition of the teams visiting each province is shown in Annex II.

3.7 Reference documents provided to the Commission are listed in Annex III.

4. The Commission undertook field trips between 16 and 27 November 1978.

5. Second Khartoum Meeting (28-29 November 1978)

5.1 The Commission members presented reports on their visits to each of the 11 provinces (Table 1, second map, these reports are on file in WHO headquarters). Each report was discussed by the Commission members and national counterparts. The Commission held a closed session to prepare the drafting of its report.

5.2 Summary of findings

5.2.1 Provincial SEP documents were examined and found adequately to reflect the work of the programme in surveillance and vaccination since 1972.

5.2.2 The quality and extent of active surveillance in easily accessible and remote areas was assessed. The impression gained by the Commission was that, whereas active surveillance in the three years following the last case had been energetic and thorough, there had been some decline in effectiveness since then. However, the Commission felt that sensitive areas were sufficiently well surveyed that any cases of smallpox that might have occurred would have been detected.

5.2.3 The system for the notification of chickenpox and suspect cases of smallpox by the static health units was examined and it was concluded that this system, in combination with a high public awareness of smallpox, was adequate for the detection of cases of smallpox in the community. The Commission found that information on chickenpox collected by health units was not efficiently communicated to the central statistical office and that the transmission of these data to the SEP staff in the provinces was in need of improvement.

5.2.4 Vaccination coverage was assessed by scar surveys in all provinces on a total of 42 316 people (Table 2). Adults and older schoolchildren were well covered, with scar rates of 93% in the adult group and 91% in the school age-groups. Younger children were less well vaccinated, 55% of 3090 children below six years of age having scars. Vaccination rates were generally lower in the more remote areas. Women were not proportionately represented in the sample examined in some provinces.

An average of 410 000 primary vaccinations a year had been recorded since 1973 (Table 3). This was significantly less than the annual number of births in Sudan and reflected the falling-off of the vaccination effort in recent years that was evident from the Commission's findings in the 0-5 age-group. Since 1976 it has not been the policy to offer revaccinations.

5.2.5 Pock mark surveys had been carried out on a large scale between 1975 and 1977. Nearly two million observations had been made on preschool and school-age children and at check posts where individuals of all ages had been examined (Table 4). No pock marks had been seen in 271 897 preschool children and only 21 of 224 297 schoolchildren had been found to have pock marks. An overall pock mark rate of 0.03% had been observed.

The Commission members examined 44 121 individuals in the preschool, school and adult age-groups. No pock marks were found in the preschool group. Pock marks were found in 18 schoolchildren and 94 adults. All those with pock marks had been infected in 1972 or earlier. Although considerably higher rates were found in the Commission's surveys than in those conducted by the national workers, it should be noted that some of the Commission surveys were carried out in areas in which smallpox was known to have been endemic. The low rates in both surveys demonstrate that the method, although useful, is an insensitive indicator of variola minor prevalence when applied, as here, six years or more after infection. Examination of people known to have had smallpox in 1972 or earlier suggested that persistent pock marks may be fewer in number or absent in individuals who are infected early in life (Table 5.).

5.2.6 The Commission was satisfied that suspect cases had been thoroughly investigated and that adequate containment measures had been taken while laboratory reports were awaited.

5.2.7 Eighty-eight specimens from suspect cases had been examined between 1973 and October 1978 (Table 6). No variola virus had been found. Herpes group viruses had been detected in 17 specimens.

5.2.8 The Commission examined the provisions made for the checking of refugees entering Sudan. It was felt that the system adequately covered this group.

5.2.9 The Commission members noted that there was considerable seasonal migration of workers from Ethiopia into agricultural schemes. They found that the arrangements for the screening and vaccination of these workers was more than adequate.

5.2.10 No stocks of variola virus or specimens from smallpox cases were being kept in laboratories in Sudan when a check was made during the Commission's visit.

6. A congratulatory address from the Director-General of WHO was read by Dr Rafique-Khan. The meeting was closed by His Excellency Sayed Khalid Hassan Abbas, Minister of Health.

TABLE 1. INVESTIGATIONS BY COMMISSION MEMBERS: NUMBER OF PLACES VISITED, AND NUMBER OF PERSONS SEEN

Province	No. of localities visited	Primary schools	Health units	Others (markets, camps, truck stops, etc.)	Total persons examined
1. Khartoum	14	2	2	4	1 575
2. Kassala	30	13	10	7	7 539
3. Red Sea	12	13	7	2	4 695
4. Northern	6	4	3	2	1 054
5. Gezira (Blue Nile N.)	12	5	19	3	2 129
6. Blue Nile S.	50	17	33	14	2 805
7. Kordofan	21	11	12	21	7 327
8. Darfur	37	5	8	19	4 814
9. Upper Nile	9	22	8	20	7 655
10. Bahr El Ghazal	28	12	20	18	2 125
11. Equatoria	30	10	8	18	2 403
Total	249	114	130	128	44 121

TABLE 2. COMMISSION MEMBER SURVEYS: VACCINATION SCAR POSITIVITY RATES

Province	Preschool			School-age			Adults		
	Seen	Positive	%+	Seen	Positive	%+	Seen	Positive	%+
1. Khartoum	469	366	78	394	343	87	712	662	93
2. Kassala	382	206	54	5 441	4 484	82	1 716	1 633	95
3. Red Sea	17	3	18	3 424	3 080	90	1 254	1 126	90
4. Northern	0	-	-	1 054	862	82	0	-	-
5. Gezira (Blue Nile N.)	99	79	80	1 613	1 552	96	273	207	76
6. Blue Nile S.	360	357	99	1 694	1 694	100	741	741	100
7. Kordofan	611	306	50	3 245	2 758	85	3 471	3 089	89
8. Darfur	414	176	43	1 234	1 157	95	1 561	1 516	97
9. Upper Nile	397	100	25	5 019	4 721	94	2 200	2 200	100
10. Bahr El Ghazal	136	55	40	1 286	1 147	90	696	653	93
11. Equatoria	205	61	30	1 787	1 383	77	411	354	86
Total	3 090	1 709	55	26 191	23 781	91	13 035	12 181	93

TABLE 3. NUMBER OF VACCINATIONS PERFORMED IN EACH PROVINCE OF SUDAN FROM 1973 TO 1977

Province	Population (1000s)	Vaccinations		
		Primary	Revaccinations	Total
1. Khartoum	1 168	219 563	212 425	431 988
2. Red Sea	468	44 690	88 864	133 554
3. Kassala	1 123	198 644	289 422	488 066
4. Northern	999	117 746	31 733	149 479
5. Gezira (Blue Nile N.)	1 865	498 870	320 895	819 765
6. Blue Nile S.[a]	2 962	231 882	37 216	269 098
7. Kordofan	2 202	232 598	270 155	502 753
8. Darfur	2 181	336 266	745 919	1 082 185
9. Upper Nile	756	143 219	640 923	784 142
10. Bahr El Ghazal	1 397	134 693	172 509	307 202
11. Equatoria	798	178 822	438 129	616 951
Total	14 902	2 336 993	3 248 190	5 585 183

[a] Includes White Nile subdivision.

TABLE 4. FACIAL SMALLPOX POCK MARK SURVEYS DONE BY THE SMALLPOX ERADICATION PROGRAMME IN THE SUDAN: 1975-1977

Province	Preschool		School-age		Check posts[a]		Total	
	No. seen	No. with pocks[b]	No. seen	No. with pocks[b]	No. seen	No. with pocks[b]	No. seen	No. with pocks[b]
1. Khartoum	109 930	0	18 328	0	52 902	7	181 160	7
2. Red Sea) 3. Kassala)	52 117	0	56 354	21	242 989	192	351 460	213
4. Northern	34 312	0	81 826	0	14 412	1	130 550	1
5. Gezira (Blue Nile N.)	30 626	0	10 860	0	263 208	7	304 694	7
6. Blue Nile S.	0	-	0	-	297 750	20	297 750	20
7. Kordofan	19 950	0	33 293	0	185 343	c	238 586	6
8. Darfur	1 517	0	2 744	0	216 825	363	221 086	363
9. Upper Nile	314	0	3 473	0	81 487	25	85 274	25
10. Bahr El Ghazal	16 461	0	16 563	0	89 810	15	122 834	15
11. Equatoria	6 670	0	856	0	6 399	14	13 925	14
Total	271 897	0	224 297	21	1 451 125	650	1 947 319	671

[a] Age breakdown unknown; mainly adults.

[b] All occurring in 1972 or before.

[c] Number not recorded.

TABLE 5. COMMISSION MEMBER SURVEYS: FACIAL POCK MARKS DUE TO SMALLPOX[a]

Province	Preschool		School-age		Adults		Total	
	Seen	No. with pocks	Seen	No. with pocks	Seen	No. with pocks	Seen	No. with pocks
Khartoum	469	0	655	3	451	8	1 575	11
Kassala	382	0	5 441	1	1 716	12	7 539	13
Red Sea	17	0	3 424	0	1 254	2	4 695	2
Northern	0	-	1 054	0	0	-	1 054	0
Gezira (Blue Nile N.)	148	0	1 714	0	267	3	2 129	3
Blue Nile S.	360	0	1 694	0	741	3	2 795	3
Kordofan	611	0	3 245	0	3 471	16	7 327	16
Darfur	414	0	1 346	0	3 054	4	4 814	4
Upper Nile	397	0	5 019	6	2 239	3	7 655	9
Bahr El Ghazal	136	0	1 286	0	703	25	2 125	25
Equatoria	205	0	1 787	8	411	18	2 403	26
Total	3 239	(0%)	26 665	18 (0.07%)	14 307	94 (0.70%)	44 111	112 (0.25%)

[a] All occurring in 1972 or before.

TABLE 6. LABORATORY SPECIMENS ANALYSED FOR VARIOLA VIRUS
1973-1978 (OCTOBER)

Province	No. collected	Variola virus	Varicella or herpes group virus positive	Variola virus negative
1. Khartoum	8	0	1	7
2. Red Sea	7	0	3	4
3. Kassala	7	0	2	5
4. Northern	3	0	0	3
5. Gezira	4	0	0	4
6. Blue Nile S.	14	0	3	11
7. Kordofan	5[a]	0	1	3
8. Darfur	6	0	2	4
9. Upper Nile	3	0	2	4
10. Bahr El Ghazal	17	0	3	14
11. Equatoria	14	0	2	12
Total	88[a]	0	17 (19%)	70 (81%)

[a] One result awaited.

ANNEX I

THE INTERNATIONAL COMMISSION FOR THE CERTIFICATION OF SMALLPOX ERADICATION IN THE SUDAN

Commission Membership

Name	Title	Country
Dr A. M. Fergany (Chairman)	Adviser, Ministry of Health, Oman	Egypt
Dr W. Koinange-Karuga	Chief Deputy Director of Medical Services, Ministry of Health Nairobi	Kenya
Dr C. Lerche (Vice-Chairman)	Director, National Institute of Public Health, Oslo	Norway
Dr S. S. Marennikova	Chief, Laboratory of Smallpox Prophylaxis, Research Institute of Virus Preparations, Moscow	USSR
Dr G. Meiklejohn (Rapporteur)	Professor of Medicine University of Colorado Medical Center Denver	United States of America
Dr D. Robinson	Community Physician Communicable Disease Surveillance Centre London	United Kingdom
Ato Yemane Tekeste	Project Manager, Smallpox Eradication Programme Addis Ababa	Ethiopia

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Dr J. G. Breman	Smallpox Eradication Unit	WHO, Geneva
Mr R. N. Evans	Smallpox Eradication Unit	WHO, Geneva
Dr Rafique-Khan	WHO Programme Coordinator	Khartoum, Sudan
Dr S. Singh	WHO Public Health Adviser	Juba, Sudan
Mr A. G. El Sid	WHO Operations Officer	Khartoum, Sudan

ANNEX II

SUMMARY OF FIELD VISITS BY COMMISSION MEMBERS

Name of Commission member	Province and capital	Name of national and WHO counterpart	Date departure	Date return
1. Dr D. Robinson	Kassala and Red Sea (Kassala and Port Sudan)	Dr J. G. Breman and Mr E. Yousif	16.11.1978	26.11.1978
2. Dr A. M. Fergany	Upper Nile (Malakal)	Mr Moh Abbas	17.11.1978	24.11.1978
3. Dr C. Lerche	Bahr El Ghazal (Wau)	Mr Mustafa Hassan	17.11.1978	24.11.1978
4. Dr G. Meiklejohn	Equatoria (Juba)	Mr Hassan Babiker	17.11.1978	24.11.1978
5. Ato Yemane Tekeste[a]	Kordofan (Obeid)	Mr Deu El Biet	18.11.978	25.11.1978
6. Dr S. S. Marennikova[a]	Darfur (Nyala)	Mr El Nur A/Alla	18.11.1978	25.11.1978
7. Dr W. Koinange-Karuga	Blue Nile S. (Sennar) Blue Nile N. (Medani)	Mr A. Gadir El Sid Mr R. Evans	17.11.1978 17.11.1978	26.11.1978 25.11.1978
8. Dr Lerche	Northern (Atbara)	Mr Gadalla Balla	25.11.1978	26.11.1978
9. Dr A. M. Fergany	Khartoum (Khartoum)	Mr M. Hassan	27.11.1978	27.11.1978

[a] In Khartoum province - 17 November 1978.

ANNEX III

REFERENCE DOCUMENTS

Document No.	Title
1	Objectives and membership
2	Provisional programme
3	Smallpox Surveillance No. 141 (Weekly Epidemiological Record, 5 May 1978)
4	Summary of Birmingham smallpox outbreak
5	Consultation on worldwide certification of smallpox eradication, October 1977
6	Methodology for preparation of appropriate data for the 31 countries remaining to be certified free of smallpox
7	Criteria and requirements for certification of smallpox eradication
8	International Commission for the Certification of Smallpox Eradication in Mozambique, Malawi, Tanzania and Zambia
9	The eradication of smallpox in Sudan
10	WHO Expert Committee on Smallpox Eradication (WHO Technical Report Series, No. 493, 1972)
11	Important points to be considered during provincial visits
12	Provisional schedule for field visits

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