WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

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REPORT OF THE THIRD MEETING OF THE COMMITTEE ON ORTHOPOXVIRUS INFECTIONS, GENEVA, 28-30 MARCH 1984

In accordance with resolution WHA33.4, 'Global Smallpox Eradication', which endorsed the 19 recommendations of the Global Commission for the Certification of Smallpox Eradication[1], a Committee on Orthopoxvirus Infections was established by the Director-General of the Organization in 1981 to advise on the post-smallpox eradication policy in order to maintain the achievement of smallpox eradication. The first meeting of this Committee was held in Geneva from 3 to 5 March 1982; the second, from 15 to 17 March 1983; and the third from 28 to 30 March 1984.

The meeting was opened by Dr S.K. Litvinov, Assistant Director-General on behalf of the Director-General. Dr F. Fenner was elected Chairman, Dr S.S. Marennikova, Vice-Chairman, and Drs K. Dumbell, D.A. Henderson, J. McCormick and J. Nakano, Rapporteurs. A list of participants, agenda and working papers are attached as Annexes 1, 2 and 3.

The meeting reviewed the progress made in the implementation of the World Health Organization's (WHO's) post-eradication policy as recommended by the above-mentioned resolution and advised on future activities under seven groups of topics.

1. Vaccination Policy (Global Commission Recommendations 1 and 2)

WHO has been informed that 160 of its 162 Member States and one Associate Member have now officially discontinued routine vaccination. In Albania, vaccination is being continued and, in France, revaccination continues for the present. In a number of countries which have stopped routine vaccination, vaccine continues to be made available, on request, to those wishing to use it.

Many fewer laboratories are now producing vaccine and those that are, report distributing ever smaller quantities of vaccine. Further steps continue to be taken by WHO to encourage all countries to cease voluntary vaccination since it is no longer required and sometimes serious, adverse reactions occur following both primary vaccination and revaccination. The Committee expressed the belief that the most effective approach to deterring unnecessary vaccination was through national governments and vaccine production laboratories to discourage them from distributing vaccine. The Committee recommended that WHO contact all governments with vaccine production laboratories and, if possible, the laboratories themselves, to remind them of the recommendations of the World Health Assembly and this Committee. It was recommended that all laboratories be requested to provide to WHO each year, a report setting forth the number of doses distributed for vaccination of the civilian population and the number of doses distributed for vaccination of laboratory workers at risk.

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[1] The Global Eradication of Smallpox. Final Report of the Global Commission for the Certification of Smallpox Eradication, Geneva, December 1979. History of International Public Health, No. 4. World Health Organization, Geneva, 1980. Refer to pages 12-15

Eight countries have informed WHO that smallpox vaccination of military personnel has been discontinued. The Committee expresses the hope that other countries may elect to do likewise since vaccination of such personnel involves risk both to the vaccinees and to their contacts. In fact, a number of patients with vaccine complications are regularly being reported among contacts of recently vaccinated military personnel. Because of this, the Committee recommends that military personnel who have been vaccinated be confined to their bases and prevented from contacting unvaccinated persons for a period of two weeks following vaccination.

For any persons potentially exposed, in the laboratory, to variola or monkeypox viruses, repeat vaccination at least every three years was recommended. Confinement of such individuals for a period of two weeks after vaccination, such as is recommended for the military, was recognized to be impractical. However, because the numbers of persons so involved are few in number and can be individually counselled about the potential hazard of transmission of vaccinia to others, the risks are considered to be small. Moreover, most will be revaccinees who are unlikely to transmit vaccinia because virus profileration is limited due to pre-existing immunity. Others, vaccinated for the first time or after a long interval since prior vaccination should be counselled to cover the vaccinia lesion, to keep it dry and to avoid physical contact with others, especially those with a history of eczema.

International certificates of smallpox vaccination are no longer required of travellers and the International Health Regulations have been amended to delete all reference to smallpox vaccination. Nevertheless, some embassies and consulates, as well as travel agencies, unaware of the World Health Assembly's decision that such certificates are no longer required, advise travellers erroneously. The Committee encouraged WHO to continue to publicize widely that smallpox vaccination certificates are no longer required. It was suggested that appropriate announcements continue to appear periodically and prominently in the Weekly Epidemiological Record and in the booklet entitled "Vaccination Certificates for International Travel and Health Advice to Travellers".

The Committee was impressed with the progress made during the last four years in implementing the recommendations of the Assembly regarding vaccination and commended WHO for its role in facilitating this achievement.

2. Reserve Stocks of Vaccine (Global Commission Recommendations, 3, 4, 5 and 6)

Pursuant to recommendations of the Assembly, WHO was requested to establish two refrigerated depots for vaccine storage. One was created in Geneva and has functioned satisfactorily. A second was established in New Delhi but because of persistent difficulties in maintaining proper temperatures, it was closed during the past year and the vaccine stocks transferred to a storage facility in Lausanne, Switzerland. The Committee endorsed this action and recommended that vaccine stocks be divided equally between the two facilities.

A satisfactory system has now been established for periodic testing of samples of vaccine in storage. The Committee reviewed the record of the potency of vaccine batches measured at intervals of several years and found that under existing storage temperatures, vaccine potency was being satisfactorily sustained.

Of the 105.6 million doses of vaccine now in storage, 7.4 million doses are packaged for use with jet injectors. Because WHO now has only a few jet injectors in stock and because there are few such instruments in general use, it was decided that it was of little practical use to continue to store this vaccine. Accordingly, the Committee recommended that the vaccine for jet injectors be destroyed unless donor countries requested to have the vaccine returned to them. A sufficient number of bifurcated needles is available to cover any emergency action.

It was recognized that additional substantial quantities of vaccine are being held by many Member Governments, the monitoring and titration of which was considered to be a national responsibility. The Committee recommended that all governments be contacted prior to the 1985 meeting of the Committee and that they be asked to provide information regarding the quantity of vaccine being stored and the conditions of storage. Such information could be useful for future reference should an emergency occur.

3. Investigation of suspected cases (Global Commission Recommendations 7 and 8)

The Committee was informed that the number of rumours of suspect smallpox cases reported to WHO declined from 26 in 1980 to 14 in 1982 but increased to 19 in 1983. Countries are now responding reasonably promptly to WHO queries and requests for investigation. The Committee expressed satisfaction that the Organization has continued to participate actively in documenting rumours and noted again the need for WHO "to maintain an effective system to coordinate and participate in the investigation of suspect smallpox cases throughout the world" in order to sustain public confidence in the eradication of smallpox.

4. Laboratories retaining variola virus (Global Commission Recommendations 9 and 10)

It was reported to the Committee that on Friday, 9 December 1983, the South African National Institute of Virology had destroyed all variola stocks held at that institute. This reduces the number of laboratories known to retain stocks of variola virus to two - the Centers for Disease Control at Atlanta, USA, and the Research Institute for Viral Preparations, Moscow, USSR. It was reported that a WHO team had visited the new high containment laboratory at the Research Institute for Viral Preparations, Moscow, and had found it to fulfil the WHO requirements for such laboratories.

5. Human monkeypox (Global Commission Recommendation 11)

Human monkeypox is a zoonosis occurring sporadically in the tropical rain forests of West and Central Africa. Monkeypox virus belongs to the genus Orthopoxvirus, and although a distinct species from variola it may give rise to an extensive rash and there is a significant mortality, particularly in children. In the laboratory the virus has a wide host range. Animals infected in nature include some species of non-human primates but the reservoir hosts are unknown. Man is an incidental host and spread from person to person is estimated to occur in only about 15% of non-vaccinated close family contacts.

The similarity between the clinical manifestations of human infection with monkeypox and variola viruses led the Global Commission for the Certification of Smallpox Eradication, in their final report in December 1979, to recommend that surveillance for human monkeypox should continue in West and Central Africa, so that more could be discovered about the clinical features, epidemiological behaviour and natural history of the disease. Although with the eradication of smallpox this newly-discovered disease constitutes the most important orthopoxvirus infection of man, information now available shows that it does not constitute a public health problem. Ongoing studies show that although clinically like smallpox, there are some potentially important differences.

Surveillance activities were substantially increased in 1982 and when these activities were reviewed at the meeting of the Committee on Orthopoxvirus Infections in March 1983, it was noted that there had been a substantial increase in the reported cases of human monkeypox in Zaire (37 cases in 1982 compared with 52 for the twelve years 1970-1981). In their report, the Committee noted that human monkeypox appeared to be commoner than had originally been thought, but it reiterated its opinion that monkeypox did not constitute a public health problem. The Committee further expressed the expectation that it would be necessary to continue monkeypox surveillance and provide appropriate laboratory support beyond 1985. It recommended that WHO should make provision to continue the support of surveillance and laboratory research on the same scale as at present, at least until the end of 1987. Accordingly, special surveillance activities were maintained in Zaire throughout 1983 and further new and substantial findings have come to hand.

In February 1984, these findings were reviewed by special consultants and a comprehensive document entitled "Evaluation of Current Situation of Human Monkeypox: Results of Last Five Years' Surveillance" was prepared (see Working Papers 14 and 19).

During the current meeting, the Committee carefully reviewed the overall picture of human monkeypox together with the above-mentioned Working Papers. Its findings and recommendations are summarized below:

5.1 Geographical distribution of rain forest and of human monkeypox cases

Almost all cases of human monkeypox have been detected in tropical rain forest areas and the majority of rain forest in West and Central Africa is to be found in Zaire (Table 1 and Figure 1). This accounts for the larger proportion of the cases being detected in Zaire and for the concentration of surveillance activities in that country.

5.2 Surveillance in Zaire

Perhaps the most important change in Zaire after 1981 was that active search activities organized on hospital- and village-based surveillance in three Regions of Zaire had been greatly intensified with the participation of 150 health stations and four mobile surveillance teams. Ninety percent of all cases in Zaire in 1982 and 1983 were discovered in these three Regions (Table 2). With more intensive surveillance, more cases were discovered (6 cases in 1981, 37 cases in 1982, and 56 cases in 1983). Increased surveillance may, however, not be the sole reason for the increase in cases. The Committee considered whether an increased number of cases might be due in part to an increase in the number of susceptible persons exposed, or to fluctuations in the prevalence of the virus in its animal hosts.

In the areas studied vaccination against smallpox had officially ceased in 1980 but sporadic vaccination was carried out in 1981. In 1982 and even in 1983 the vaccination scar rate in children under 4 years of age had fallen substantially (Table 3). As the numbers of unvaccinated children increase it might be expected that the proportion of cases in children would increase. So far there is no evidence of a shift in the age distribution of cases but it is still premature to reach a conclusion on this matter. An increase in the number of cases might also be a temporary phenomenon, reflecting some cyclical fluctuation in the transmission of the virus among animals. Surveillance must be continued for a longer period before the data are available to give satisfactory answers to these points. Some additional help might be obtained from studies of the prevalence of monkeypox infection in selected animal species.

Although the numbers are small, the rate of person-to-person transmission between susceptible family contacts appeared not to have changed significantly from the 15% estimated for the period 1970-1981 (Table 4).

The Committee recommended that surveillance on human monkeypox in Zaire should be continued at least until 1989 to determine whether the incidence will change and to seek the reasons for any changes found.

5.3 Incidence outside Zaire

There was one case in Ivory Coast in 1981 and in February 1984, 5 cases were discovered in the southernmost part of the Central African Republic among pygmies. Although in Zaire the disease is well recognized, the occasional occurrence of cases of monkeypox in other countries in West and Central Africa has given rise to rumours that smallpox had not been eradicated. It will be important to provide full information on sporadic occurrences of this zoonosis to the other countries in West and Central Africa.

The Committee recommended that adequate briefing should be given to the health authorities of countries in West and Central Africa with areas of tropical rain forest, so that their health personnel will be aware of the existence of this newly-recognized disease, human monkeypox.

If a suspected case of monkeypox is discovered, national health services should be encouraged to report to WHO and special investigations, including the collection of specimens for laboratory study, should be made to confirm or negate the diagnosis. Pertinent information should be added to the WHO data bank of human monkeypox.

5.4 Animal reservoir(s) and primary infection

The animal reservoir(s) of monkeypox virus are as yet unknown, despite studies carried out by WHO collaborating centres and by special WHO teams on several occasions from 1971 to 1979. The epidemiology does not fit that of an arthropod-borne disease. Serological investigation of specimens collected during these surveys revealed that at least four species of monkey had been infected in nature, and there is evidence of the infection of chimpanzees. However, although sera containing antibodies to orthopoxviruses were obtained from a wide range of other animals including squirrels, it is not yet technically possible to ascertain in all cases whether the positive reactions were due to an infection with monkeypox virus or another orthopoxvirus. Previously unrecognized orthopoxviruses have been isolated in other parts of Africa, for example from a gerbil in Benin and from horses in Kenya, and the existence of an orthopoxvirus, other than monkeypox, in rain forest areas cannot be excluded.

All cases of human monkeypox have had access to carcasses of animals of some kind within the presumed incubation period of about 14 days, but so have the other people living in these villages. The majority of the animals were apparently healthy. These data provide no lead to the source(s) of human monkeypox infection, and there is need for case control studies, to determine more precisely the kinds of animals with which cases had been in contact, in contrast to control households. There is, however, some evidence which is suggestive. An infant in Zaire developed monkeypox 12 days after being abducted by a chimpanzee, an animal known to be susceptible to natural infection with monkeypox virus and to develop a generalized rash. The five cases discovered in pygmies in the Central African Republic early in 1984 were infected at about the same time, and it was said that some days before they had eaten the meat of a monkey and a gazelle both sick with a pock-like disease. The pygmies further said that pock disease was often encountered in monkey and gazelle, and that meat from such cases was not given to children or pregnant women who, unlike adults, might then contract a similar disease.

The Committee recommended that international cooperation should be continued in support of the surveillance and research activities now centred in Zaire.

The Committee further recommended that a research centre, including a small laboratory unit, should be established in an appropriate place in Equateur Region, Zaire. Its functions would be to serve as a reference centre for surveillance activities. It would also act as a forward base for the collection and despatch of specimens; it would provide some facilities for visiting scientists; and it would help to identify animals that might be suspected in case control studies. Establishment of such a centre will be beneficial not only to Zaire but also to other countries of West and Central Africa where this zoonotic disease occurs. It was reported that a project was currently under discussion between WHO, Zaire and the Japanese Government.

5.5 Person-to-person transmission

Human monkeypox is not easily transmitted from one person to another. Of 13 presumed transmission episodes among humans since 1982, transmission stopped at secondary infection in 9 episodes but may have proceeded to the third or fourth generation in four episodes (Figure 2). These data are based on a range in the rash-to-rash periods of 7 to 23 days after rash in the index case. Thus, some of the episodes of presumed person-to-person spread could be co-primary infections or another infection from infected animals. However, it is important to establish clearly any change in the frequency of person-to-person transmission of human monkeypox.

The Committee recommended that during surveillance activities, special attention should be paid to the possibility of secondary and subsequent cases.

5.6 The need to develop a specific and sensitive serological test for monkeypox

The genus Orthopoxvirus includes nine known species, of which three and possibly four (vaccinia, monkeypox, taterapox and possibly an orthopoxvirus that affects horses in Kenya) occur in West and Central Africa. All orthopoxviruses show extensive serological cross-reactivity, by neutralization tests as well as other methods. For some years methods have been available for making presumptive species-specific diagnoses for monkeypox, variola and vaccinia by tests on sera absorbed first with viral suspensions. Such tests are not readily applicable to convalescent sera or sera from healthy animals or man taken during ecological or epidemiological surveys.

The lack of an appropriate specific and sensitive serological test to determine whether animals or man have been infected with monkeypox virus has somewhat reduced the value of two large scale surveys; an ecological survey made in Zaire in 1979 and a serological survey to determine the prevalence of human infection in Sierra Leone, Ivory Coast, Congo and Zaire in 1981. In both, orthopoxvirus-positive sera were found, but in many cases it was impossible to determine whether these were due to prior infection with monkeypox virus or some other orthopoxvirus. The most urgent requirement in laboratory methods needed to support the surveillance and field studies of human monkeypox is a sensitive and readily applicable test for monkeypox virus-specific antibodies, which can be applied to sera collected during ecological and epidemiological surveys. Such a test is also needed to help determine whether subclinical sporadic or person-to-person infection occurs. At the moment it is not clear how soon such a test may become practicable.

The Committee recommended that WHO should promote and coordinate urgently studies in interested laboratories aimed at the development of sensitive serological tests for the identification of specific monkeypox antibodies. The strategy for such development is described in detail in Method of identification of specific monkeypox antibody, 6. Laboratory investigations.

5.7 Summary

In spite of a recent increase in the number of reported cases, human monkeypox remains a rare sporadic zoonotic disease with limited capacity to spread between humans. There were 56 cases discovered in 1983 among about 5 million people who live in rain forest in the three Regions of Zaire where surveillance is operating. At present the disease does not require special public health measures. However, much of the population in the enzootic region, especially in the 5-14 year age group, still retains some immunity due to vaccination against smallpox. Surveillance activities at the same scale and in the same places in Zaire as carried out in 1982 and 1983, continued until 1989 should provide a clear indication of the extent to which human monkeypox could be considered to be a public health problem, either generally or in special localities. Such surveillance would also provide a definitive clinical and epidemiological picture of this newly-discovered disease. Further research on its ecology and epidemiology is dependent on the development of a simple, specific and sensitive serological test for monkeypox virus-specific antibodies.

The Committee finally recommended that Working Paper 14 as reviewed and revised during the meeting should be submitted for publication in the WHO Bulletin as an interim evaluation of progress in an important activity following the eradication of smallpox.

The Committee also recommended that a less detailed review might be prepared from this paper, for possible publication in the WHO Chronicle, so as to reach a wider audience, and further that a brief abstract of the conclusions and recommendations should be submitted for publication in the Weekly Epidemiological Record.

6. Laboratory investigations (Global Commission Recommendations 12, 13, 14 and 15)

DNA studies of variola and monkeypox had been continued in the USA and UK and commenced in Japan. Further endonuclease maps had been prepared for additional strains of the viruses and for a more detailed analysis of certain fragments of the genomes. A new technique of comparison by electron microscopy of molecules of DNA segments of variola and monkeypox in

homoduplex and heteroduplex form was described. This technique can locate those regions of the large DNA molecules where the two viruses differ significantly from each other. Preliminary results had localized one region of heterogeneity between monkeypox and variola DNA which should be studied further. The Committee recommended that the heteroduplex investigation be supported so that it can be extended to cover the whole genome of at least two strains of each of the two viruses.

It was reported to the Committee that studies of the comparative sensitivity to monkeypox virus of various laboratory animals were continuing in Tokyo and involved mastomys and rabbits as well as African and Asian monkeys.

It was reported that field specimens of sera from patients with Tanapox came for the most part from people with history of previous vaccination; cross reaction tests utilizing Tanapox and orthopox antigens are therefore difficult to interpret and must await the results of laboratory studies of monospecific sera raised in laboratory animals against Tanapox and monkeypox viruses. It was reported that these studies are about to commence at the Centers for Disease Control.

Further results of the RIAA test on sera from West Africa were reported by the Centers for Disease Control, Atlanta. Evidence of previous monkeypox infection was obtained in a few of these but many gave equivocal results. A possible explanation for this was provided by workers at the Research Institute for Viral Preparations, Moscow. Using cowpox and vaccinia viruses to infect laboratory animals, previously infected with the other virus, they had found that the serological response to the second virus varied with the inoculum and with the time interval between the two infections. Only in some circumstances could the second infection be positively identified by serological tests. This may be an instructive model for the sera collected in Africa from suspected cases of monkeypox. It is the experience of the above two laboratories that when epidemiologically and clinically presumed monkeypox occurred in a previously vaccinated person, the serological diagnosis of monkeypox could often be made from the results of FA and the RIA or ELISA titres even though this might conflict with the RIAA result.

Methods of identification of specific monkeypox antibody

No new procedures were reported which permit specific identification of monkeypox antibody, although some advances were made in several areas.

Monoclonal antibodies have now been produced in two different laboratories which are able to distinguish monkeypox virus from other known orthopoxviruses. Collectively, these monoclones react with a wide variety of proteins from virus-infected cells as well as from purified virus. Attempts at competitive blocking of the monoclone with polyvalent sera, and isolation of proteins on affinity columns have not been successful, although these efforts are in an early stage of development.

The present method of serologic diagnosis of monkeypox used in most laboratories is an initial screening hemagglutination inhibition test followed by absorption with vaccinia antigen and a final ELISA or RIA for the remaining specific monkeypox antibody. While it is felt that this test is likely to be very insensitive, it is currently the accepted method for identification of monkeypox antibody, and will remain so until present efforts at developing a new test come to fruition.

The elucidation of the epidemiologic patterns of monkeypox and the identification of a reservoir and/or intermediate hosts depend heavily on a reliable and sensitive serologic test specific for monkeypox antibody. Several approaches to solving this problem be initiated as described below:

i A competitive blocking ELISA with the blocking by polyvalent sera from humans or animals of enzyme labelled monkeypox specific monoclonal antibodies being evidence of monkeypox specific antibody.

ii That work continue to produce more monkeypox specific monoclonal antibodies which may be tested in the procedures outlined above.

iii Affinity column isolation of proteins by monoclonal antibodies and the exploration of whole or enzyme digested proteins as possible sources of monkeypox specific antigen usable in a serologic test.

iv The exploration of anti-idiotype antibodies as sources of synthetic antigen which could be used as monkeypox specific antigen for serologic test.

v The use of monkeypox specific polyclonal sera to capture monkeypox specific antigens potentially usable in a monkeypox specific ELISA test.

vi The search for monkeypox DNA segments which code for protein potentially usable as antigens in a monkeypox specific ELISA should be continued.

It is also specifically recognized that for this development intensive collaborative work will be required in the field as well as in laboratories to be coordinated by WHO. Such laboratories include the Centers for Disease Control, Atlanta, USA; Duke University Medical Center, Durham, USA; Department of Virology, St Mary's Hospital Medical School, London, UK; Research Institute for Viral Preparations, Moscow, USSR; Microbiology Department, Medical School, Niigata University, Niigata, Japan; the Centre for Applied Microbiology and Research, Porton Down, UK; and the National Institute of Health, Tokyo, Japan.

7. Archives and Publications (Global Commission Recommendations 16 and 17)

7.1 Archives

The archives are now well established and the records appropriately indexed. Some additional work will be required to complete this task when all activities finally terminate. The Committee believes it would be desirable if archival material pertaining to the programme in countries in western and central Africa, now held at the U.S. Centers for Disease Control, eventually be incorporated in the global archival collection. Negotiations are continuing between WHO and the Centers for Disease Control concerning this matter.

7.2 Publications

Work is now well advanced to write and publish a book of about 500 000 words dealing comprehensively with relevant scientific, operational and administrative aspects of the smallpox eradication programme. WHO will publish the book which will consist of some 32 chapters. As working drafts of chapters are completed, they are being circulated to knowledgeable persons for comment. It is hoped that a reasonably advanced draft of the book will be completed by December 1984 and that the book will be published in 1986.

8. Conclusion

The Committee highly commends WHO for effectively and diligently implementing the recommendations of the Thirty-third World Health Assembly regarding activities to be undertaken in the post-smallpox eradication era. At this time the Committee foresees as major activities beyond 1985 the following: investigation of smallpox rumours, maintenance of smallpox vaccine reserves and surveillance and research of human monkeypox. The Committee specifically stressed the importance and urgency of the last of these three activities which requires continuation of a WHO special programme.

Table 1 West and Central Africa: Number of human monkeypox cases reported by country 1970 - 1 March 1984

Country	Number of cases															Total cases
	Year															
	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84 (Feb)	
Cameroon	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2
C.A.R.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5
Ivory Coast	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	2
Liberia	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Nigeria	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	3
Sierra Leone	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Zaire	1	-	5	3	1	3	5	6	12	7	3	6	37	56	3	148
Total	6	3	5	3	1	3	5	6	13	9	3	7	37	56	8	165

Table 2 Zaire: Human monkeypox cases by Region, 1970 - 1 March 1984

Region	Pop. (million)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984 (Feb.)	Total
Bandundu*	3.6	-	-	1	-	-	1	1	1	2	1	1	-	8	3	-	19
Bas-Zaire	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equateur*	3.0	1	-	3	3	1	-	3	3	4	5	1	5	20	47	3	99
Haut-Zaire	4.0	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	2
Kasai Oc.	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	6
Kasai Or.*	1.8	-	-	1	-	-	2	1	1	5	1	1	1	6	-	-	19
Kinshasa	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kivu	4.8	-	-	-	-	-	-	-	1	1	-	-	-	1	-	-	3
Shaba	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	27.8	1	0	5	3	1	3	5	6	12	7	3	6	37	56	3	148

* Active surveillance is being carried out in 5 million persons living in 5 sub-regions of these three Regions

Table 3 Zaire: Percent of persons with a smallpox vaccination scar present in villages where a human monkeypox case occurred and in surrounding villages within a 10 km radius, by age group, by year, for 80 cases where data are available, 1970 - 1983

Year	Affected village				Surrounding area			
	No. of cases	Percent with scar present			No. of localities	Percent with scar present		
		Age group 0-4	5-14	15 +		Age group 0-4	5-14	15 +
1970	1	86.1	97.2	98.1	7	85.3	94.1	96.1
1971	-	-	-	-	-	-	-	-
1972	3	39.0	91.5	95.1	28	52.1	91.3	87.5
1973	2	61.9	95.0	94.2	8	60.0	94.4	93.1
1974	1	57.6	-	-	-	-	-	-
1975	1	55.6	80.8	85.7	7	5.7*	79.3	94.5
1976	4	44.6	83.5	87.7	52	40.0	83.2	88.7
1977	5	85.4	89.7	91.4	69	79.9	95.9	91.6
1978	8	74.6	92.8	93.9	103	61.6	93.3	92.8
1979	6	45.2	85.0	95.6	71	36.1	83.6	95.1
1980	3	43.7	87.4	92.9	15	41.2	94.9	92.5
1981	4	39.2	91.0	97.8	24	50.6	73.8	91.2
1982	19	33.2	81.6	94.2	179	26.3	86.9	93.4
1983	23	12.5	83.9	91.8	228	18.1	84.0	90.9

*Only 35 children 0-4 years were examined (2 with scar)

Table 4 Zaire: Comparison of human monkeypox secondary attack rates in unvaccinated household contacts, 1970 - 1981 and 1982 - 1983

	1970 - 1981			1982 - 1983		
Age group	No. of cases	No. of contacts	Attack rate (%)	No. of cases	No. of contacts	Attack rate (%)
0 - 4	2	18	(11.1)	9	52	(17.3)
5 - 14	3	17	(17.6)	5	40	(12.5)
15 +	1	5	(20.0)	2	10	(20.0)
Total	6	40	(15.0)	16	102	(15.7)

Figure 1: **WEST AND CENTRAL AFRICA**
LOCATION OF 163 HUMAN MONKEYPOX CASES
REPORTED 1970–1 MARCH 1984

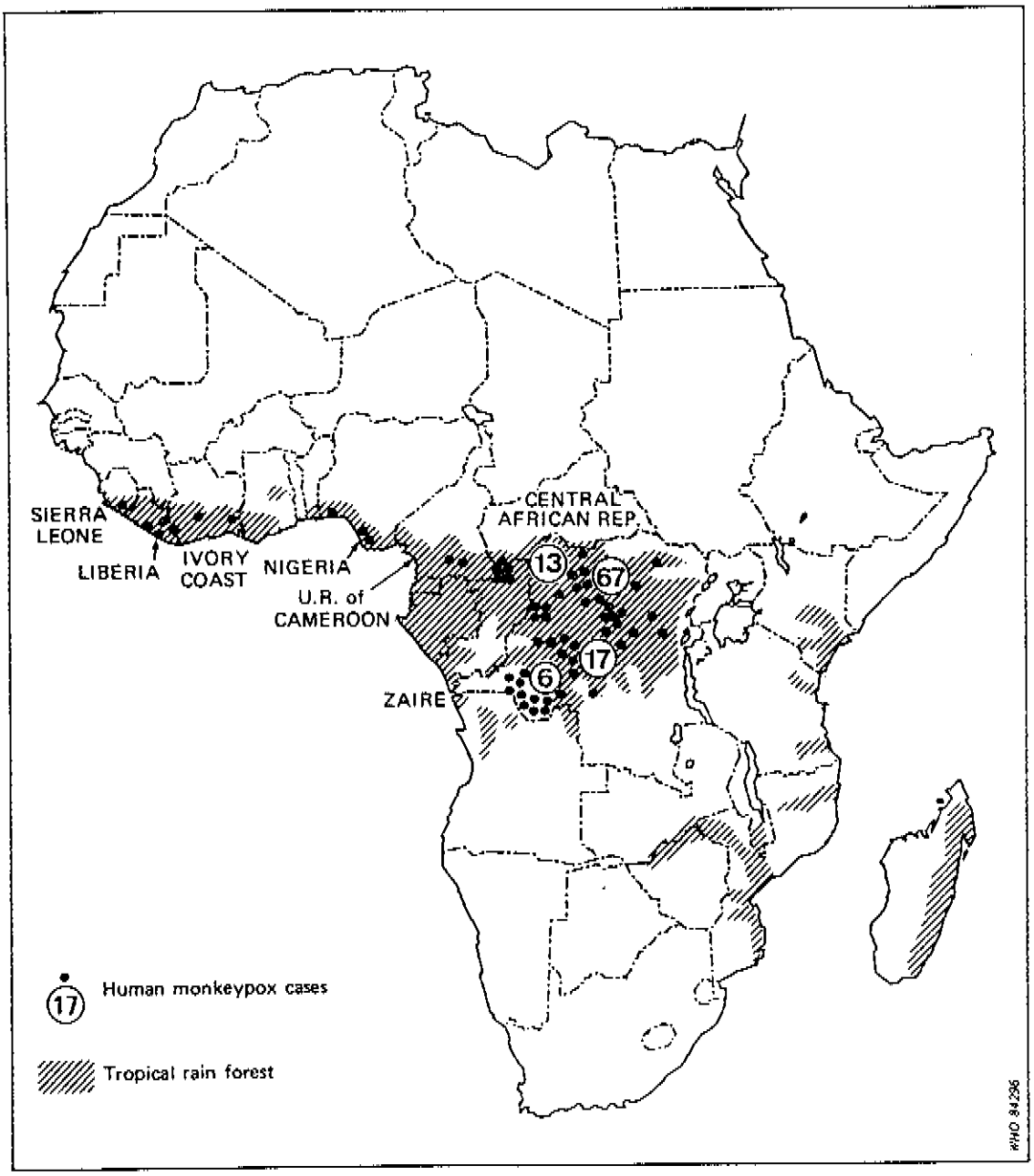
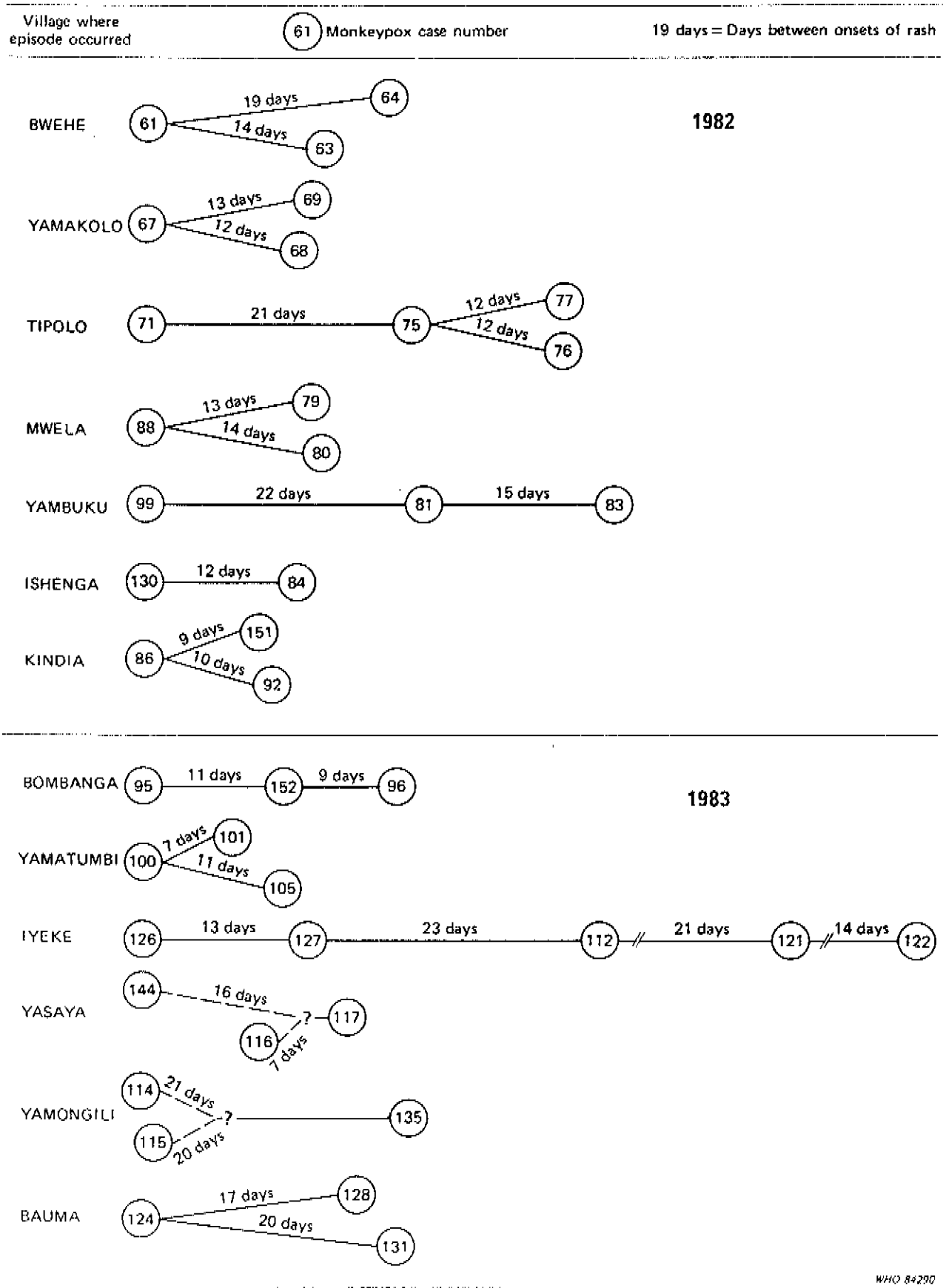


Figure 2 ZAIRE: HUMAN-TO-HUMAN TRANSMISSION OF MONKEYPOX, 1982–1983



COMMITTEE ON ORTHOPOXVIRUS INFECTIONS
Geneva, 28 - 30 March 1984

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COMMITTEE ON ORTHOPOXVIRUS INFECTIONS
Geneva, 28-30 March 1984

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[1] Unable to attend

COMMITTEE ON ORTHOPOXVIRUS INFECTIONS
Geneva, 28-30 March 1984, Room E.110

AGENDA

Time	Item No.	Subject
Wednesday 28 March		
0900	1	Opening
	2	Selection of Chairman and Rapporteur
	3	Adoption of Agenda
	4	Introduction
0930	5	Vaccination Policy
	5.1	Discontinuation of Routine Smallpox Vaccination (G.C. rec.1)
	5.2	Discontinuation of Requirement for Vaccination Certificates (G.C. rec.2)
0940	6	Reserve Stocks of Vaccine (G.C. recs. 3, 4, 5, 6)
0950	7	Investigation of Suspected Smallpox Cases (G.C. recs. 7, 8)
1000	8	Laboratories Retaining Variola Virus Stocks (G.C. recs. 9, 10)
1030		Coffee Break
1050	9	Laboratory Investigations (G.C. recs. 12, 13, 14, 15)
1110	10	Status of Current Research
1230		Lunch Break
1400	11	Documentation of the Smallpox Eradication Programme (G.C. recs. 16, 17)
1420	12	Human Monkeypox: Present Situation (G.C. rec. 11)
1530		Coffee Break
1550	13	Human Monkeypox: Future Surveillance and Research
1730		End of Session
Thursday 29 March		
0830	14	Finalization of Plan of Action for Monkeypox Surveillance and Research
1030		Coffee Break
1050		Item 14 continued
1230		Lunch Break
1400	15	Review of Strategy for Monoclonal Antibody Studies
1530		Coffee Break
1550		Item 15 continued/Drafting of Meeting Report
1730		End of Session
Friday 30 March		
0900	16	Finalization of Meeting Report
1030		Coffee Break
1200	17	Closure of Meeting

ANNEX 3

COMMITTEE ON ORTHOPOXVIRUS INFECTIONS
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Working Paper/Subject		Prepared/Presented by
	Opening	Dr S. K. Litvinov, ADG
WP 1	Draft Agenda	
WP 2	Introduction: Status Report	Dr I. Arita
WP 3	Status by Country of Discontinuation of Routine Vaccination and Requirements for Vaccination Certificates	Dr L. Khodakevich/ Mr J. Wickett
WP 4	Vaccine Reserve: WHO and National Stocks, Location, Testing Results	Mr J. Wickett/ Dr L. Khodakevich
WP 5	International Rumour Register	Dr L. Khodakevich/ Mr J. Wickett
WP 6	Report on Visit to Moscow Laboratory	Mr V. Oviatt
WP 7	Preparations of Variola DNA	Dr K. Dumbell
WP 8	Preparations of Variola DNA	Dr P. Greenaway
WP 9	Status Report on Current Research	Dr J. Nakano
WP 9a	Zaire Tanapox/Monkeypox Serosurvey Progress Report - presented by Dr Nakano	Dr H. H. Walls
WP 10	Status Report on Current Research	Dr J. Williamson
WP 11	Status Report on Current Research	Dr Y. Ichihashi
WP 12	Status Report on Current Research	Dr S. S. Marennikova
WP 13	Status Report on Current Research	Dr T. Kitamura
WP 14	Evaluation of Current Situation of Human Monkeypox; Results of last Five years' Surveillance	SME
WP 15	Not utilized	
WP 16	Monkeypox Surveillance in Zaire	Dr Kalisa Ruti
WP 17	Status Report on Human Monkeypox	Dr Z. Jezek
WP 18	Preliminary Analysis of Various Aspects of Human Monkeypox	SME
WP 19	Proposed Plan of Action for Monkeypox Surveillance and Research	Dr J. McCormick Dr P. Brès
WP 20	Monkeypox Surveillance in Central African Republic	Dr L. Khodakevich

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