



## **Smallpox eradication: destruction of variola virus stocks**

### **Report by the Secretariat**

#### **BACKGROUND**

1. The global eradication of smallpox was confirmed in 1980 (resolution WHA33.3). From 1981 to 1986, WHO undertook a programme to implement the post-eradication policies contained in the 1979 report of the Global Commission for the Certification of Smallpox Eradication and endorsed by the Health Assembly in resolution WHA33.4. Progress was reviewed year by year from 1981 to 1984 by the WHO Committee on Orthopoxvirus Infections. In 1986 this Committee reviewed the implementation of the 19 recommendations on post-eradication policy endorsed by the Health Assembly in 1980, and made recommendations to the Director-General on the policies that should be followed by WHO. In conformity with recommendations 9 and 10 of the Global Commission endorsed in resolution WHA33.4, all known stocks of smallpox virus were consolidated in two WHO collaborating centres during the mid-1980s, one in the Russian Federation and the other in the United States of America, to assure biosafety and security. The Committee also recommended that the remaining stocks of live variola virus be destroyed.
2. An Ad Hoc Committee on Orthopoxvirus Infections was subsequently established with a mandate to assess progress and current activities of the post-eradication programme from 1986 onwards and, more specifically, to review the previous recommendation that all remaining stocks of live variola virus be destroyed. The Ad Hoc Committee first met in December 1990. A second meeting was held in September 1994 and a third in January 1999.
3. In 1990 the Ad Hoc Committee recommended the destruction by 31 December 1993 of the remaining stocks held in the two WHO collaborating centres. Nevertheless, destruction of the stocks did not take place, following the expression of public health and research concerns by the scientific community. There was also a request at the ninety-third session of the Executive Board (January 1994) that the issue be referred to the Board prior to final destruction of stocks. The Ad Hoc Committee met again in September 1994 and proposed the date of 30 June 1995 for destruction of the remaining stocks. However, the Board decided at its ninety-fifth session to postpone consideration of the Ad Hoc Committee's report to a future session.
4. In 1996, following a proposal to that effect by the Executive Board at its ninety-seventh session, the Health Assembly adopted resolution WHA49.10 recommending that destruction should take place on 30 June 1999, after a further decision had been taken to that effect by the Health Assembly. It was envisaged that the period between 1996 and 1999 would be used to achieve a broader consensus on the issue.

5. In early 1998, in order to determine whether a broader consensus had been reached, the Secretariat undertook a survey of the positions of WHO's 191 Member States on the proposed destruction. The survey showed that of the 79 countries which responded, situated in all WHO regions, 74 were in favour of destruction of all variola virus stocks as recommended in resolution WHA49.10. One country was against destruction and four were undecided.

6. In January 1999, given the above, and in view of the current debate within the scientific community over destruction and the recent outbreak of human monkeypox in central Africa, the Director-General convened the Ad Hoc Committee again to review all relevant information pertaining to possible destruction of the stocks of variola virus in 1999, and to advise WHO accordingly.

7. The Ad Hoc Committee members were not unanimous in their views. Five members favoured the destruction of all existing stocks of smallpox virus by June 1999 in accordance with resolution WHA49.10. Two members were in favour of eventual destruction with a review in five years' time, and two favoured retention of the stocks. The members who advocated retention of the virus took the view that any potential which might arise in the future for developing scientific information of value should not be precluded. Although other members agreed that such findings might be useful, they expressed greater concern at the risk of the virus being released.

8. The Ad Hoc Committee members nevertheless all agreed that stocks of archival, cloned DNA should continue to be kept in both WHO repositories and that they should include duplicated stocks of two strains of variola major and one strain of variola minor. In addition, it was agreed that (-irradiated, killed variola virus should be kept for use as an essential antigen in laboratory diagnostic tests for human monkeypox virus infection.

9. Furthermore, members agreed that advances in polymerase chain reaction (PCR) technology have now made it possible to recover fragments of variola virus DNA from inactivated material such as (-irradiated, killed virus or formalin-treated, infected tissue. It is recognized that such sources of variola virus DNA exist in many laboratories around the world. However, earlier recommendations have been made that PCR amplification of variola virus DNA followed by its subsequent expression by other orthopoxvirus vectors should be prohibited. Such prohibition should also apply to the chemical synthesis of variola virus DNA.

10. Pending destruction of remaining stocks, the Ad Hoc Committee stressed that with respect to laboratory containment of the variola virus, work with all remaining variola smallpox strains should continue to be carried out only in high-containment biosafety level 4 laboratories in the Russian Federation (State Research Centre of Virology and Biotechnology, Koltsovo, Novosibirsk Region) and the United States of America (Centers for Disease Control and Prevention, Atlanta, Georgia) until international agreement on their destruction is reached. The laboratories will be subject to regular reviews by national safety authorities and to external review by WHO. Access to the material is strictly controlled and additional physical security measures to prevent removal of infectious material are in place.

## ISSUES

11. The 1999 Ad Hoc Committee on Orthopoxvirus Infections made the following recommendations:

- (a) *If destruction is confirmed*

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- C National authorities that have contributed collections held at the two WHO collaborating centres should be advised of the plans to destroy the virus strains transferred to WHO repositories.
  - C The process set out in the 1994 report of the Ad Hoc Committee should be followed at the time of destruction of smallpox virus stocks. However, signatories to the certification of destruction should involve the Head of State instead of the “most senior health official” as originally proposed in that report.
  - C Stocks of smallpox virus-infected material in which the virus has been killed by (-irradiation should be excluded from destruction. Such (-irradiated, killed material should be produced before destruction of smallpox virus stocks but be safety-tested to ensure that it does not contain live virus.
  - C WHO Member States should be asked to reconfirm that they do not have stocks of smallpox virus.
- (b) *If destruction is further delayed*
- C WHO should ensure regular visits (at least every five years) to the repositories of smallpox virus to review biosafety and security.
- (c) *In both cases*
- C It is important that clinical, epidemiological, laboratory and ecological features of the cases of rash illness in the areas associated with outbreaks of human monkeypox be investigated carefully and promptly.
  - C Stocks of archival cloned DNA should be kept in both WHO repositories and they should include duplicated stocks of two strains of variola major virus and one strain of variola minor virus.
  - C WHO should advise its Member States to retain their stocks of smallpox vaccine.
  - C The stockpile of smallpox vaccine (Lister Elstree strain) stored in the National Institute of Public Health and the Environment, Bilthoven, Netherlands, should be maintained and regularly checked.
  - C The deliberate release of smallpox virus should be considered a crime.

## **ACTION BY THE HEALTH ASSEMBLY**

12. Given this background, if the Health Assembly wishes to adopt a resolution implementing its recommendation contained in resolution WHA49.10, the text of a resolution to this effect could be as follows:

The Fifty-second World Health Assembly,

Noting that on 8 May 1980 the Thirty-third World Health Assembly in resolution WHA33.3 declared the global eradication of smallpox;

Noting that resolution WHA33.4 endorsed recommendations for the post-eradication era which specified that remaining stocks of variola virus should be held at only a limited number of sites, and that the stock of variola virus has since been reduced and restricted to the WHO collaborating centres on smallpox and other poxvirus infections designated at the Russian State Research Centre of Virology and Biotechnology, Koltsovo, Novosibirsk Region (Russian Federation) and the Centers for Disease Control and Prevention, Atlanta, Georgia (United States of America);

Noting further the recommendation of the Forty-ninth World Health Assembly that the remaining stocks of variola virus, including all whitepox viruses, viral genomic DNA, clinical specimens and other material containing infectious variola virus, should be destroyed on 30 June 1999 after a decision has been taken by the World Health Assembly, that being a moratorium of five and a half years from the deadline of 31 December 1993 proposed by the Ad Hoc Committee on Orthopoxvirus Infections, with a view to taking action to achieve a broader consensus,

DECIDES that the process of destroying the remaining stocks of variola virus, including all whitepox viruses, viral genomic DNA, clinical specimens and other material containing infectious variola virus, should be initiated by 30 June 1999 and completed by 31 December 1999.

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