Improving public health preparedness for and response to the threat of epidemics: anthrax network

with the participation of the Office International des Epizooties (OIE) and the Food and Agriculture Organization of the United Nations (FAO)

Report of a WHO meeting

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1. Introduction

A meeting on Improving public health preparedness for and response to the threat of epidemics: anthrax network was held in Nice, France, from 29 to 30 March 2003, just prior to the 5th International Conference on Anthrax (30 March–3 April 2003). The WHO meeting was attended by some members of the Anthrax Working Group, as well as other invited individuals and representatives of other organizations (Office international des Epizooties (OIE) and the Food and Agriculture Organization of the United Nations (FAO)). The list of participants and details of the programme are given in Annex 1 and 2 respectively.

Professor Martin Hugh-Jones (Louisiana State University, Louisiana, USA) chaired the first day of the meeting; Dr Peter Turnbull (Salisbury, England) chaired the second day. Dr Andrew Turner (Andrew Turner Consulting Pty Ltd, Victoria, Australia) acted as rapporteur.

2. Meeting objectives

The main objectives of the meeting were to review WHO’s activities on anthrax and plan future strategies, and revise specific sections of the 4th edition of the previously entitled Guidelines for the surveillance and control of anthrax in humans and animals.

3. Anthrax situation in Europe

Led by the Chairman, Professor Martin Hugh-Jones, there was an open and productive discussion on why certain regions and countries had managed to reduce the incidence of anthrax to apparent freedom of disease or merely very infrequent events, while others continued in an endemic state. For countries with a past history of contaminated livestock feed, the present climate of their denial because of BSE had had many advantages. Various problems were highlighted, however:

- The urgent need to coordinate human and veterinary reporting and actions;
- Similarly to coordinate veterinary and medical training in the control of this disease;
- An inexpensive, sensitive, and specific rapid field test for animal anthrax needs to be developed and made available in order to neutralize the costly delays involved in normal laboratory testing and confirmation;
- The confusion between farm quarantine in relation to disease freedom (2 weeks) and for sale for slaughter and butchering (6 weeks) needs to be urgently addressed: the
quarantine period lengths need to be defined on the basis of scientifically sound epidemiological studies or by some other approach.

- Although prevention, through vaccination, is usually held to be a private cost, the frequency of contaminated meat being sold in open markets with resultant human cases, e.g. in Peru, Central Asia, Central and Southern Russian Federation, India, and many African countries, makes it clear that this disease can and does have a significant public cost in certain regions of the world and therefore must become part of the active health policies of the affected countries, FAO, OIE, and WHO;

- The problem of under-recognition and of under-reporting is a global problem, irrespective of the wealth of individual countries and needs to be addressed;

- A structured programme of regional meetings needs to be established to increase awareness, coordinate optimum control procedures, encourage related research, and to improve surveillance and especially veterinary surveillance.

A draft national survey on control procedures in relation to livestock disease and site control and the industrial handling of potentially contaminated products (meat and bone meals, hides, etc.) was circulated to the members present for comment and changes. These have since been collated and an improved survey document is presented in Annex 3.

4. Presentations

Dr Ottorino Cosivi (WHO, Geneva, Switzerland) presented WHO’s activities to assist countries to manage biological threats, in the context of WHO’s strategy for global health security. This strategy is supported through global networks of partnerships and founded on three pillars: contain known risks, respond to the unexpected, and improve national preparedness. The International Health Regulations, currently under revision, provide the overarching mandate to guide countries towards global health security.

Dr Williamina Wilson (WHO, Geneva, Switzerland) focused on WHO’s activities on anthrax. The objectives of the WHO project are (i) to establish a global network of anthrax experts and diagnostic laboratories with defined anthrax capabilities; (ii) to establish standard procedures relating to anthrax and disseminate information; and (iii) to set up as well as implement training and quality assurance. The current status of the project and future plans were outlined, and questions for discussion were raised.

Professor Martin Hugh-Jones presented details of the Laboratory Response Network in the United States of America, in the absence of Dr Stephen Morse (Centers for Disease Control and Prevention, Atlanta, USA), who could not attend the WHO meeting as planned. A background document was also provided by Dr Morse, showing that “The Laboratory Response Network is an international, unified consortium of laboratories that was established in response to the threat of bio-terrorism. The Laboratory Response
Network is fully capable of responding quickly and appropriately to national or local public health emergencies. It has the capacity to respond to both bioterrorism events and naturally occurring outbreaks of infectious disease.” It is noted in the background paper that in 2000, two laboratories in Canada joined the network, and since then laboratories in Australia and the United Kingdom of Great Britain and Northern Ireland have also joined.

Professor M. K. Lalitha (Christian Medical College and Hospital, Vellore, India) shared her experience of networking for surveillance of anthrax. She outlined the need for such networks and the types (experts and laboratories) and levels (national, regional, global) these could be. The classification of laboratories in the WHO Region for South-East Asia was presented, along with the role of the laboratories at each level. The interaction of the potential partners in the surveillance of anthrax was illustrated, finishing with issues that need to be addressed.

Dr Philippe Dubois (WHO Office in Lyon, France) described WHO’s Integrated Capacity Development Programme for laboratory specialists, a specialized two-year programme targeted at laboratory specialists from developing countries. The participants are given the opportunity to enhance their knowledge and skills through mentoring by experts in a variety of technical areas. The programme focuses on strengthening disease detection and response activities in the home countries of the participants through the elaboration and implementation of a plan of action and specially tailored field training and support. To date, three cohorts have been recruited to the programme, from countries of the WHO African Region, the WHO Eastern Mediterranean Region, and the WHO European Region (Eastern Europe and the former Soviet Union).

Mrs Lorraine Arntzen (National Institute for Communicable Diseases, Johannesburg, South Africa) presented the experience of her institute in running an external quality assessment programme for plague in plague-endemic countries in the WHO African Region. The results were described, along with the problems that arose, such as the difficulties of transporting dangerous materials. Suggestions for the successful running of external quality assurance programmes were outlined.

Professor M. K. Lalitha, Dr Philippe Dubois, and Mrs Lorraine Arntzen led discussions on a network of experts and laboratories; training; and quality assurance, respectively. The outcome of the discussions is outlined in section 6.

5. Revision of the Guidelines for the surveillance and control of anthrax in humans and animals

Preparation of the 4th edition of the Guidelines for the surveillance and control of anthrax in humans and animals was discussed. Dr Peter Turnbull (Salisbury, England) provided a progress report on the status of the revision, indicating what remained to be done.
The title of the 4th edition would be *Anthrax in humans and animals*, with a list of contributors rather than authors.

Participants had the opportunity to make suggestions/corrections on the draft text. Extra comments should be sent to Dr Turnbull by the end of May 2003. An updated text (with incomplete references) will then be prepared by Dr Turnbull by July/August 2003, and will be posted on the WHO web site for six weeks for comments. Following the six-week period, the final version would be prepared for printing.

It was suggested that updates of the annexes would be produced as and when they are considered necessary, and they would be posted on the WHO web site. A complete revision of the whole edition could be considered after about five years following the publication of the 4th edition, if required.

The session ended with a discussion of whether any of the information in the 4th edition could be considered of potential use to bioterrorists. It was concluded that, as it provided no material that could be construed as instructions on weaponization of *B. anthracis*, it could not be so construed.

6. WHO activities on anthrax: aims, status, and recommendations

Objective 1

1a. Network of anthrax experts

Aim: To establish a network of anthrax experts and involve them in diagnosis, surveillance, and responding to outbreaks, and to provide guidance on WHO’s activities on anthrax. The experts should be able to provide advice on training materials produced by WHO and may participate in training and quality assessment programmes, particularly at the regional level.

Status: The informal Working Group on Anthrax Control and Research has been expanded: it currently consists of 31 experts in 19 countries: Argentina, Australia, Canada, China, Colombia, England, France, Georgia, Germany, India, Indonesia, Italy, Nepal, Philippines, Russian Federation, South Africa, Thailand, Turkey, United States of America.

The members of the group have been asked for advice on: reference public health and veterinary laboratories; key people responsible for dangerous public health pathogens; other anthrax experts; existing networks; and the questionnaire for laboratories. Those who were able to attend the meeting in Nice 29–30 March 2003 provided advice on WHO’s strategy and on the revision of the anthrax guidelines.
**Recommendations:**
WHO should expand its pool of experts able to be involved in anthrax diagnosis, surveillance, and response to outbreaks, as well as in training and quality assurance programmes. While the network should be geographically and technically representative, its structure should be based on the needs of countries and should be flexible.

**1b. Network of diagnostic laboratories with defined anthrax capabilities**

**Aim:** To establish a network of diagnostic laboratories with defined anthrax capabilities.

**Status:** A questionnaire for laboratories has been developed, in collaboration with members of the Working Group, to compile a profile of the anthrax capabilities of the laboratories. It is available in two formats (MSExcel and MSWord), in four languages (English, French, Spanish, and Russian). A background document, also available in the four languages, has also been prepared.

The questionnaire is being sent to the reference veterinary and public health laboratories in each WHO Member States, through a variety of channels: OIE, FAO, WHO Global Salm-Surv, WHO regional offices, WHO Office in Lyon, as well as the Working Group members.

As of 27 March 2003, 68 questionnaires had been received from 51 countries.

**Recommendations:**
- WHO should characterize the capabilities of existing laboratories, using the questionnaire and follow-up, and will identify the international and regional reference laboratories. As for the network of experts, the structure of the network of laboratories should be based on the needs of countries and should be flexible.
- WHO should maintain and improve its collaboration with other organizations (e.g. FAO and OIE) and existing networks.
- WHO should encourage the sharing of information between veterinary and public health laboratories.
- A restricted-access web site should be developed by WHO. The restrictions on access should be kept to a minimum.
- WHO should seek funding to support the long-term maintenance of this network.
Objective 2

Aim: To establish standard procedures relating to anthrax and to disseminate information.

Status: The revision of the 3rd edition of the *Guidelines for the surveillance and control of anthrax in humans and animals* was discussed at the meeting in Nice (29–30 March 2003). A draft of the 4th edition — *Anthrax in humans and animals* — will be posted for comments on the WHO web site by July/August 2003.

Standard operating procedures developed by the WHO Regional Office for South-East Asia have been utilized in the revision of the anthrax guidelines. The 4th edition of the guidelines will in turn form the basis of practical worksheets for training.

Recommendations:

- WHO will post the draft version of the 4th edition on the web for comments and will coordinate production and printing of the final version with Dr Peter Turnbull.

- Updates of the annexes should be produced as and when they are considered necessary, and should be posted on the web site.

- WHO should update and expand its information resources for health care professionals and the public. The material should be readily available on the WHO web site and in print.

Objective 3

Aim: To set up and implement training and quality assurance programmes for laboratories that are part of the network.

Status: to be set up and implemented.

Recommendations:

- WHO should develop a training module on anthrax diagnosis and epidemiology, based on the 4th edition of the anthrax guidelines, to be entitled *Anthrax in humans and animals*.

- The training materials should be field tested in the Integrated Capacity Development Programme for Laboratory Specialists organized by the WHO Office at Lyon, France. A new cohort of participants is expected in the first half of 2004, from Sahelian countries as well as Algeria, Morocco, and Tunisia.

- An anthrax workshop for laboratories (one laboratory from each of several WHO regions) should be held following the field test in Lyon. Laboratories which
participate in the workshop would ideally serve as regional focal points for expansion of the training and expansion of the network.

- A reagent bank of selected anthrax diagnostic materials should be established. This bank would consist of “orphan” or difficult to acquire anthrax diagnostic materials, such as anthrax-specific antisera. Suitable reference laboratories would need to be established to prepare and send out samples and reagents. Laboratories would be able to order essential reagents through the restricted-access web site, and would use the site to report their quality assurance results.

- Efforts should be made by WHO to complement other training and quality assurance programmes, e.g. those organized by WHO Global Salm-Surv; the WHO Regional Office for Africa/WHO Office in Lyon.

- WHO should seek funds to support the training and external quality assessment programmes for the long-term future.
Annex 1

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Annex 2

Programme

29 March 2003

09.00–09.15 Secretariat’s welcome and election of chair (Ottorino Cosivi)
    Chairman’s welcome and introduction (Martin Hugh-Jones)

09.15–09.45 Anthrax free vs non-free regions of Europe
09.45–10.30 Issues of anthrax in Eastern Europe/Central Russian Federation
10.30–11.00 Explanation and distribution of questionnaire on disease-control activities (Martin Hugh-Jones, Andrew Turner)
    Other issues, e.g. vaccination strategies and consequences

11.30–14.40 Presentations of topics

11.30–12.00 WHO project: outline, status, and future plans (Ottorino Cosivi; Williamina Wilson)
12.00–12.20 United States Laboratory Response Network (Martin Hugh-Jones, on behalf of Stephen Morse)
12.20–12.40 National and regional networks (M. K. Lalitha)
14.00–14.20 Training: scope and experience of WHO Office in Lyon (Philippe Dubois)
14.20–14.40 Quality assurance: experience of QA activities for plague (Lorraine Arntzen)

14.40–17.30 Discussions and conclusions (see following page for details of discussion topics)

    Topic 1  Network of experts and laboratories (Leader: M.K. Lalitha)
    Topic 2  Training (Leader: Philippe Dubois)
    Topic 3  Quality assurance (Leader: Lorraine Arntzen)

17.30–17.40 Data from Russian Federation (Beniyamin Cherkasskiy)
17.40–17.50 Outline of next day’s session (Peter Turnbull)
17.50–18.00 Chairman’s concluding remarks (Martin Hugh-Jones)
30 March 2003

09.00–12.50  Revision of specific sections of the 4th edition of the Guidelines for the surveillance and control of anthrax in humans and animals (Chair: Peter Turnbull)

12.50–13.00  Closing remarks (Peter Turnbull, Martin Hugh-Jones, Ottorino Cosivi)
**Annex 3**

**Questionnaire**

**Veterinary zoonotic control activities for anthrax**

| Country: __________________________ | Compartment/Region: __________________________ |

### 1. Veterinary activity

1.1 Vigorous investigation and surveillance for anthrax
- [ ] Yes  [ ] No

1.2 Infected carcasses disposed of by or under the direct supervision of Veterinary Services’ activity
- [ ] Yes  [ ] No

1.3 Location of each carcass mapped
- [ ] Yes  [ ] No
  1.3.1 If yes, were the GPS coordinates of the location recorded?
- [ ] Yes  [ ] No

1.4 Anthrax animal sites disinfected
- [ ] Yes  [ ] No
  1.4.1 If yes, how are sites disinfected? ____________________________

1.5 Quarantine enforced
- [ ] Yes  [ ] No
  1.5.1 If yes, for how long? ________________________________________

1.6 Other ____________________________

### 2. Disposal of infected carcasses

2.1 Burning at site
- [ ] Yes  [ ] No

2.2 Incineration off site
- [ ] Yes  [ ] No

2.3 Rendering off site
- [ ] Yes  [ ] No

2.4 Burying
  2.4.1 Burying ≥2 m (from the surface to the top of the carcass)
- [ ] Yes  [ ] No
  2.4.2 Shallow burying <2 m (from the surface to the top of the carcass)
- [ ] Yes  [ ] No

2.5 Carcasses abandoned at site
- [ ] Yes  [ ] No

2.6 Other ____________________________

### 3. Occurrence of anthrax in animals

3.1 Multiple outbreaks\(^1\) each year
- [ ] Yes  [ ] No

3.2 One outbreak each year/other year
- [ ] Yes  [ ] No

3.3 One outbreak per 2–10 years
- [ ] Yes  [ ] No

3.4 One outbreak > per 10 years
- [ ] Yes  [ ] No

3.5 Other ____________________________

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\(^1\) An outbreak is defined as an epizootic limited to a localized increase in the incidence of a disease, e.g. in a village, town, or closed institution.
4. **Anthrax vaccination of animals**

4.1 Widespread preventive vaccination undertaken each year in known or recognized outbreak areas  
☐ Yes ☐ No

4.2 Widespread vaccination undertaken when there is an outbreak  
☐ Yes ☐ No

4.3 Minimal vaccination undertaken when there is an outbreak  
☐ Yes ☐ No

4.4 Vaccination of affected herd post-outbreak and for a further ____ years by government or through government subsidies  
☐ Yes ☐ No

4.5 Preventive vaccination undertaken by government  
☐ Yes ☐ No

4.6 Other ____________________________

5. **Industrial anthrax**

5.1 Does your country import and process wool, hair, hides, bones, or meat meals from anthrax-infected countries?  
☐ Yes ☐ No

5.1 Processing of domestic & imported materials at factories includes:

5.2.1 Sterilizing treatment of wool, hair, hides, and bones before processing?  
☐ Yes ☐ No

If yes, Chemical treatment ________ (tick if applicable)

Irradiation ________

Heat ________

5.2.2 Treatment of waste materials from factories for anthrax risks with:

Chemicals ________ (tick if applicable)

Other ________ (please specify)

5.2.3 Treatment of effluent water from factories for anthrax risks with:

Chemicals ________ (tick if applicable)

Other ________ (please specify)

5.2.4 Retreatment of meat meals before animal use?  
☐ Yes ☐ No

6. **Any comments?**