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EXECUTIVE SUMMARY

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Exercise GLOBAL MERCURY was a command-post exercise involving the GHSAG nations<sup>1</sup> plus the World Health Organization and the European Commission. Conducted over a 56-hour period between 8 and 10 September 2003, the exercise aimed to evaluate the communications protocols between and among GHSAG members in the face of an outbreak of an infectious disease.

The scenario for Exercise GLOBAL MERCURY (which was designed to be biologically-plausible) depicted an attack using fictitious self-inoculated terrorists to spread smallpox internationally to target countries. The exercise was designed to elicit public health interventions rather than a full counter-terrorism response. The scenario was designed to introduce “live” cases of smallpox into some countries and contacts into others to develop the whole range of possible national responses. A comprehensive “script” supported by exercise injects generated player responses to exercise events.

Planning for the exercise began in October 2002, with the establishment of an exercise planning group chaired by Canada and comprising “trusted agents” from all player nations/organizations. The exercise was developed, delivered and evaluated by a contractor selected and paid by Canada<sup>2</sup> – other players were responsible for contracting local support for exercise play and evaluation.

Some player countries capitalized on the exercise scenario to conduct parallel national exercises to practice and evaluate national smallpox contingency plans.

Communications were effected using email, telephone, facsimile and video-conferencing. Some significant issues were identified both in technological and process senses.

As a result of the evaluations conducted during the exercise, the following outcomes were noted:

- Given the high volume of information generated by the Exercise, the establishment and maintenance of all forms of communications (telephone, fax, video conferencing, and email) was more challenging than anticipated prior to the exercise. More robust communications infrastructure and better information management processes are required to deal with the exchange of large volumes of information.
- While all participants have developed national smallpox plans, many of these plans could be strengthened by greater elaboration of their international components.
- Current, accurate contact information for key public health facilities and personnel need to be maintained.
- Greater attention needs to be paid to organizational structures and the training of public health personnel involved in and supporting a response to permit better collation, analysis and interpretation of available information.
- No single mode of communications proved adequate to all requirements – multiple communications means must be available throughout an emergency response.
- The communications structure used proved to be overly complex and at times created some difficulties for information exchange between the participants.

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<sup>1</sup> GHSAG nations are Canada, France, Germany, Italy, Japan, Mexico, the United Kingdom, the United States.

<sup>2</sup> Tempest Management Corporation, of Ottawa, Ontario, provided the contracted exercise design and evaluation staff.

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The resulting recommendations from Exercise GLOBAL MERCURY are:

- **Recommendation 1** - Members of the GHSI recognized the mandate of WHO places the Organization in a strong position to undertake information collection, dissemination and effective coordination of action in the event of a public health emergency of international concern and urges the Director General to keep under review the priority and resourcing of this activity.
- **Recommendation 2** - The GHSAG should establish a mechanism for rapid international communications between the exercise participants. Future tests should be scheduled (on an ongoing basis) to assure that technical challenges do not hinder communications between the countries/organizations likely to be involved in an international public health emergency.
- **Recommendation 3** - National smallpox plans should be reviewed and the critical international aspects enhanced.
- **Recommendation 4** - GHSAG members are encouraged to share emergency response guidelines, functions and structures to facilitate international communication.
- **Recommendation 5** - The GHSAG should refer discussions on common terminology to the Field Epidemiology Working Group.
- **Recommendation 6** - The Exercise Planning Group recommends that member countries / organizations periodically evaluate their infrastructure and systems for international information exchange during public health emergencies.

Exercise GLOBAL MERCURY was described by all participants as being well coordinated, realistic and valuable as a test of international communications. Participants believe that similar exercises should be scheduled regularly, possibly annually.

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## SECTION 1 - BACKGROUND

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### INTRODUCTION

Exercise GLOBAL MERCURY<sup>3</sup> was an international exercise intended to provide an assessment of the ability of the exercise player countries to communicate and coordinate all aspects of an outbreak of smallpox. Scheduled to be conducted over a period of 56 hours (representing 12 days of 'real time' play) on 08, 09 and 10 September 2003; the exercise was actually terminated after 44 hours when the Exercise Director considered that all of the exercise objectives had been achieved.

The exercise began in Canada at 4 pm EDT on Monday 8 September. Other players began to receive information on the possibility of a smallpox outbreak approximately 8 hours later (a period of two exercise

### AIM OF THE REPORT

The aim of the Post Exercise Report is to provide a review of all aspects of Exercise GLOBAL MERCURY including planning, conduct, lessons learned and recommendations for improvements/enhancements to international communication protocols associated with an outbreak of smallpox.

### EXERCISE AIM

Exercise GLOBAL MERCURY was undertaken to evaluate the communication protocols between and among the countries that make up the Global Health Security Action Group (GHSAG).

### EXERCISE TRAINING OBJECTIVES

The exercise training objectives were to:

- evaluate international communications generated as a result of the discovery of a case of smallpox;
- record international aspects of national smallpox plans for later analysis;
- review national and international smallpox communication control challenges; and
- develop Lessons Learned.

### COLLATERAL TRAINING OPPORTUNITIES

The exercise provided:

a realistic forum in which player nations were able to practice and evaluate national health emergency operations centres during a simulated emergency;

an opportunity for player nations to review their national communication protocols related to a public health challenge; and

a scenario and format to conduct a national exercise to practice and evaluate internal communications, processes and procedures.

### EXERCISE STAGES

There were four stages of the exercise – initiation, planning, conduct and reporting. Each of these stages is discussed in separate sections of the report.

### LESSONS LEARNED AND RECOMMENDATIONS

The report concludes with two sections that discuss these aspects of the exercise.

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<sup>3</sup> The name of the exercise (and the logo) was suggested by the Exercise Development Team. 'GLOBAL' reflects the extent of the exercise and the degree of involvement by the players. 'MERCURY' is the mythological messenger of the Gods.

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**SECTION 2 – INITIATION STAGE**

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The decision to undertake the exercise was reached at a meeting of the GHSAG in October 2002. Canada volunteered to design, conduct, and evaluate the exercise.

Subsequently, a contract was let by Health Canada to an Ottawa firm, Tempest Management Corporation, to provide the exercise design, conduct, control, evaluation and reporting staff.

An exercise structure (shown below) for the Planning Stage was agreed upon and established for the initial meeting of the Exercise Planning Group (EPG).

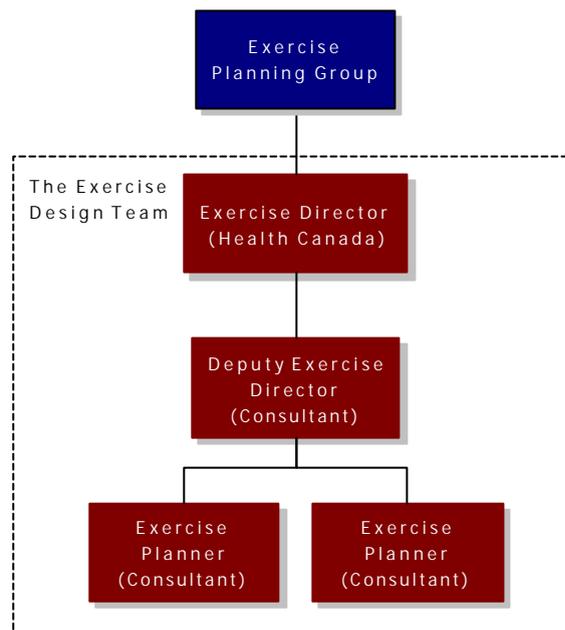


Figure 1 - The Exercise Planning Structure

Prior to the initial meeting of the EPG in London, the Exercise Design Team developed a series of briefings on optional exercise structures and controls and also prepared two outline scenarios for discussion.

During the meeting an exercise structure and controls were agreed upon. As well, an outline scenario was selected and expanded by the members of the EPG. These two items were used by the Exercise Development Team to begin the planning process.

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## SECTION 3 – PLANNING STAGE

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### THE EXERCISE PLANNING GROUP

The need for an EPG was agreed at the October GHSAG meeting and countries / organizations participating in the exercise were invited to identify ‘trusted agents<sup>4</sup>’ to oversee and assist in the process of exercise development.

As Canada had undertaken to contract exercise delivery, the Canadian representative to the EPG (Health Canada’s Director-General, Centre for Emergency Preparedness and Response) assumed the role of Chair of the EPG.

### COMPOSITION

Every participating country / organization provided one or more representatives to the EPG<sup>5</sup>. As there was no requirement to structure the EPG into working groups or committees, all EPG meetings were conducted as forums within which decisions were taken by consensus following which direction was issued to the exercise contractors by the Chair of the EPG.

### SUITABILITY

Exercise development could not have occurred without the guidance of the EPG. Both the structure and the working methodology of the EPG were appropriate. Should another exercise of this nature be planned, the adoption of an EPG will considerably enhance and facilitate exercise design and conduct.

### CONTINUITY

The continuity of membership in the EPG was excellent, despite the extended period over which exercise design and development took place and the occurrence of “real” health emergencies during the development timeframe (notably SARS). Continuity was a positive factor in ensuring consistency of approach and a flow to exercise development.

The need for continuity of the members of the EPG must be stressed at the outset of an exercise planning and development cycle.

### THE PLANNING PROCESS

#### *DEVELOPMENT OF THE TRAINING OBJECTIVE*

During the first meeting of the EPG (held in London in November 2002) the question of training objectives was raised. The evaluation of the ‘communications protocols’ to be used in the event of the appearance of smallpox was selected as the primary objective (in accordance with the GHSAG Ministers’ direction).

However, when EPG members were questioned on the details of the “communication protocols”, it was established that no document had ever been produced to articulate what protocols and methodology might be used.

The EPG decided to carry on with exercise development notwithstanding the absence of this crucial document. The EPG’s intent was to identify communication requirements through the medium of a simulated use of smallpox as a weapon of terror and from that identification to embark on the formalization of a set of protocols for international communication in the event of actual outbreak of smallpox.

Lacking a set of protocols, it was necessary to decide on how communications would be coordinated during the course of the exercise.

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<sup>4</sup> Trusted Agents are selected for their subject matter expertise and their availability for the full period of the exercise development stage. For this exercise, the National Trusted Agents became the National Controllers during the exercise conduct and reporting stages.

<sup>5</sup> See Annex A for a list of the EPG members.

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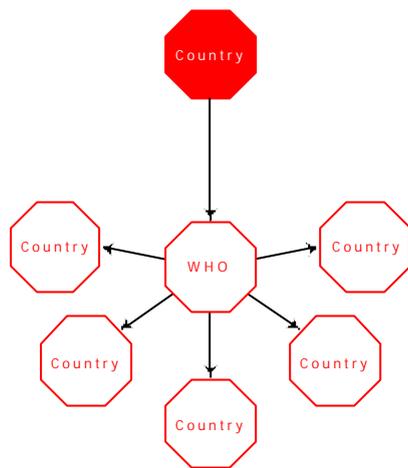


Figure 2 - A Sunburst Communications Structure

One option considered was the “sunburst” structure (as depicted to the left). This option closely resembles the global communication structure used by the WHO in the post-eradication stage following the global eradication of smallpox. WHO acted as the central station of the structure and assumed the task of coordinating and regulating communications between nations on the network and acted as a central clearing house for information. Because of the configuration of the GHSAG members participating in Exercise GLOBAL MERCURY, the EPG decided that the communication structure for the exercise would be the one that is used in normal, ongoing activities, i.e. a multi-point “star” (illustrated to the right). In this model no

nation/organization would assume the responsibility to coordinate international communications as each player was free to communicate directly with every other player.

#### *TIME FRAME*

A preliminary meeting of the EPG was held in London, England in November 2002. Subsequent meetings of the EPG took place in conjunction with GHSAG committee and ministerial meetings in December 2002 (Mexico City, Mexico) and June 2003 (Geneva, Switzerland).

Exercise design commenced in November 2002 after the EPG had approved design assumptions at its London meeting.

The contractors presented updates to the EPG on the progress of exercise development in December 2002 and presented a final draft of all exercise materials to the EPG meeting in Geneva in June 2003. On receipt of approval of exercise materials, final versions were developed and distributed by both e-mail and courier.

The initial intention of the GHSAG was to conduct the exercise in June 2003. International involvement with SARS forced the postponement of the exercise. While this provided opportunities for additional “fine tuning” of exercise documentation, it had the disadvantage of somewhat diluting the focus and intensity of EPG members because of the long period between conception and delivery of the exercise.

#### *METHODOLOGY*

Exercise design began with the selection (and enhancement by the EPG), of a biologically-plausible scenario surrounding the “index case” of the exercise. The intent of the exercise was to evaluate the earliest stages of international response to the occurrence of smallpox, specifically from the perspective of public health.

From this start point, the exercise designers developed a “story board” that was populated with exercise characters whose movements and activities were designed to ensure player countries’ involvement was portrayed in the larger exercise scenario. The scenario was designed to introduce “live” cases of smallpox into some countries and contacts into others to develop the whole range of possible national responses.

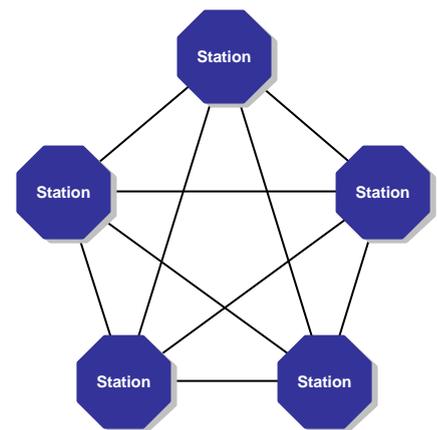


Figure 3 - A Star Communications Structure



The “story board” was organized and presented in three forms, the first showing character activities by player, the second showing character activities by country and the third showing relationships between and among the exercise characters.

The exercise designers then developed detailed exercise injects designed to initiate player responses appropriate to events had they actually occurred. These injects consisted of telephone scripts, facsimile message, e-mail texts and newspaper articles specifically structured to provide relevant exercise information as if it were being generated in a real event.

The exercise was designed to take place over a period of 48 consecutive hours (56 hours in Canada) and involved countries located across a span of 14 time zones. This time period covered 12 fictitious scenario days.

The exercise design included an exercise control and evaluation structure that operated in parallel with the player structure. The Exercise Director, Dr St John, and the Exercise Chief Controller (a contractor) operated from Ottawa, while controller/evaluator cells operated at each of the ten player locations.

Exercise controllers were responsible for introducing the exercise injects to players in accordance with a closely-controlled timetable. They were also required to evaluate player responses to identify what went well, what went less well and what lessons might be learned from player reactions to exercise events.

Overall, the exercise structure as shown to the right was agreed upon.

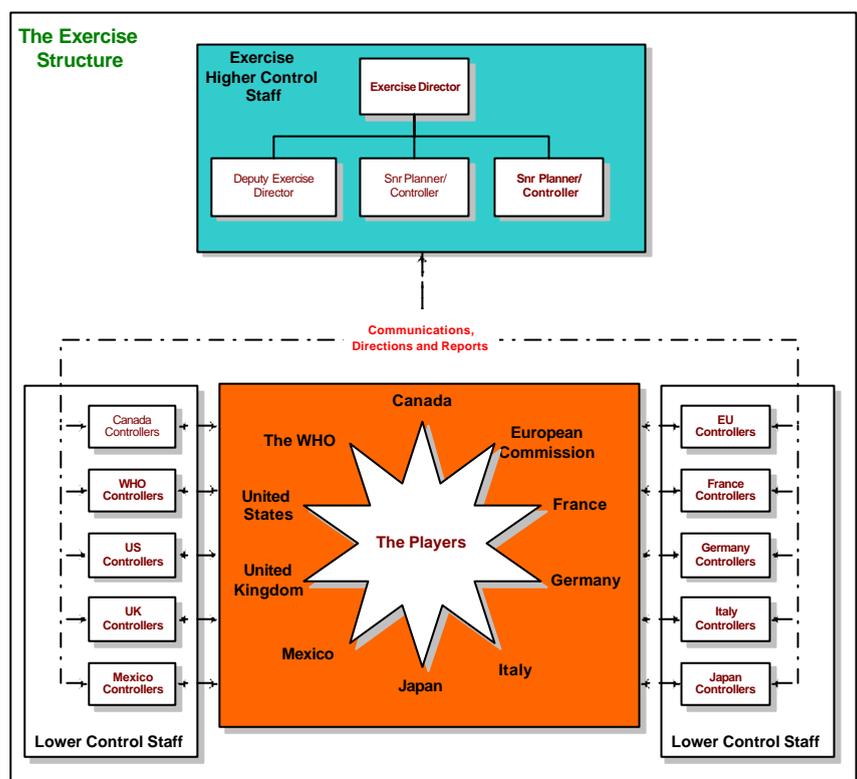


Figure 4 - Exercise Structure

#### NATIONAL INPUTS

All of the nations and agencies participating in Exercise GLOBAL MERCURY were invited to identify requirements that were then expanded into injects into the exercise scenario. In some instances, controllers developed injects for their own players that were then approved by the exercise development team.

#### CONSULTATION

During the course of the exercise development constant communication was maintained between the EPG and the Exercise Development Team. In addition, input and direction was sought from the EPG at two conferences held in Mexico City (December 2002) and Geneva (June 2003). This consultation process was vital to ensure that the EPG, the controllers and the exercise evaluators were involved in the process and were fully aware of the exercise scenario, the Master Events List and the supporting documentation.



## SECTION 4 – CONDUCT STAGE

### OPENING EVENTS

All players were provided an opening scenario that described the state of the world at exercise commencement and gave some mock intelligence information about a fictitious terrorist group that mounted the simulated attack.

Because the initiating event of the scenario occurred in Canada, exercise play there started eight hours before the main exercise began.

The initiating event was the simulated collapse of a traveler in Vancouver Airport. A fictitious Quarantine Officer became suspicious because of the symptoms the traveler displayed and temporarily detained other travelers in the customs and immigration waiting area. The Quarantine Officer provided the first inject that started exercise play. Subsequently, the character represented was (notionally) evacuated to a hospital where medical authorities became involved in exercise events.

Exercise play developed in Canada to the point where Canadian medical authorities became convinced of the likelihood that the collapsed traveler was infected with smallpox, at which point they instituted GHSAG activities for mutual notification and the actual international communications play began.

Later events were driven by exercise injects that provided additional information to prompt players to discuss, reach decisions and communicate their activities and information to other players.

### TIME COMPRESSION AND ZULU TIME<sup>6</sup>

Time compression was used in the exercise to maintain the credibility of exercise events. Because the incubation period of smallpox was longer than the actual period of exercise play, it was necessary to “speed up” the passage of time portrayed in the exercise.

Time compression is always difficult and challenging to exercise players. Part of the reason for this is that many player activities require “real time” to complete, for example, a briefing note or media release. Time compression is also disorienting as actual activities such as shift changes and rest breaks take place in “real time”.

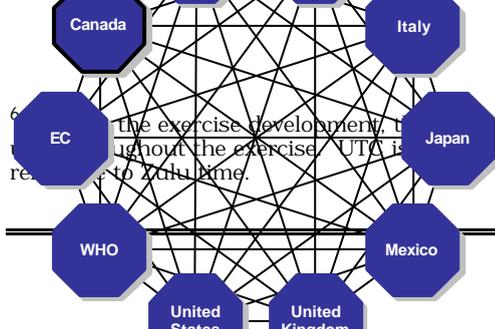
The Exercise Control Staff managed time compression through the periodic release of advisory messages that informed players what exercise day it was and (in some cases) what time of day it was.

The use of Zulu Time was necessary because players spanned the globe from Japan (Z + 9 hours) to Mexico (Z - 5 hours) – a difference of 14 hours. Thus, rather than try to describe time on the basis of local time in this large number of time zones, all exercise events were referenced using Zulu Time. This was confusing to players at first but quickly became less so as players adjusted to the time protocol.

### EXERCISE COMMUNICATIONS

As noted above, the aim of Exercise GLOBAL MERCURY was to evaluate international communications using the “star” structure described in Section 2.

The actual player communication model used during the exercise is shown to the right. Telephone, video, and email communications were all employed. Occasional use was made of a video conferencing system.



<sup>6</sup> During the exercise development, the Exercise Design Team decided that Universal Coordinated Time (UTC) would be used throughout the exercise. UTC is abbreviated by the letter 'Z', which is phonetically pronounced 'Zulu'; hence the reference to Zulu time.



It is evident from the number of lines connecting the ten player nations/agencies that, even in the relatively simplified structure of Exercise GLOBAL MERCURY, this is a complex communication structure.

There were numerous instances of communication difficulties throughout the exercise, partly because of the large amount of information that was generated during the course of exercise play. Information overload was a reality of the exercise, confirming the necessity for good information handling processes.

Conference calls were used throughout the exercise to exchange information between the players. The exercise revealed a need for improved technical support for teleconferencing and video conferencing.

Email was an additional tool for exchanging information. The volume of information flow posed challenges for its management. For example, the large volume of messages caused a vital server at one nation to become overloaded, crash and be unavailable for a four-hour period, limiting email traffic between that nation and the other players. The need for robust, redundant IT infrastructure was underlined by this event.

Figure 5 - Exercise Communications Structure

While large volumes of information were exchanged, there were still gaps in developing a common understanding of the global situation. Organizational structures and training of emergency responders require additional emphasis.

#### SUMMARY OF KEY FINDINGS

As a result of the evaluations conducted by local Controllers and Evaluators during the exercise, the following outcomes were noted:

- The establishment and maintenance of all forms of communications (telephone, fax, video conferencing, and email) was more challenging than anticipated prior to the exercise.
- While all participants have developed national smallpox plans, many of these plans could be strengthened by greater elaboration of their international components.
- Current, accurate contact information for key public health facilities and personnel need to be maintained.
- More robust communications infrastructure and better information management processes are required to deal with the exchange of large volumes of information.
- Greater attention needs to be paid to organizational structures and the training of public health personnel involved in and supporting a response to permit better collation, analysis and interpretation of available information.
- No single mode of communications proved adequate to all requirements – multiple communications means must be available throughout an emergency response.
- The communications structure used proved to be overly complex and at times created some difficulties for information exchange between the participants.



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SECTION 5 – REPORTING STAGE

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**INTRODUCTION**

This stage of the exercise was conducted in three parts.

The first part was a review conducted immediately following the exercise by local evaluators designed to gather initial impressions of the exercise players on what went right, what went wrong and what could be done to improve the processes.

The second part was the preparation of lessons learned by the controllers and evaluators and their submission to the Exercise Development Staff.

The final part was the preparation of this report and its review by the EPG in preparation for its submission to the Ministers' Meeting in Berlin.

**EXERCISE PARTICIPANT FEEDBACK**

Immediately following the exercise, local controllers conducted a post exercise review. Comments that follow were provided by the controllers as a summary of each player nation/organizations impressions.

**SUMMARY COMMENTS**

**CANADA**

Players in Canada were pleased with their efforts to respond to the notional public health emergency imposed by the exercise. Three teams of roughly 15 people each worked rotating eight hour shifts to react to the scenario and to evaluate the Centre for Emergency Preparedness and Response's ability to communicate with other players.

The complexity of establishing and maintaining communications with international partners was confirmed and many objective lessons about the need to enhance communications capability were learned. The use of a new Emergency Operations Centre provided information on a number of technical details that have to be reviewed. The National Smallpox Plan was used and some omissions were identified for potential corrective action.

In summary, Exercise GLOBAL MERCURY proved to be a valuable effort that produced an unexpected enthusiasm among the Canadian Players.

**FRANCE**

France wishes to thank Canada for the organisation of this exercise. It also recognises the outstanding quality of the work of the scenario planners. By its plausibility and its complexity, the scenario made it possible for France to test the effectiveness of its National Smallpox Response Plan (NSRP) as well as its communication capability. Indeed, the scenario developed in France required the implementation of the various levels of emergency of the NSRP.

The French players were mobilised in conditions very similar to a real situation due to their extremely short notice period.

Practically speaking, the 7-strong French team took turns during the entire duration of the exercise, while maintaining its regular activity as the alert and emerging diseases unit. Technical details (operation room, communication systems, food) were taken care of by another specialised department according to French emergency procedures.

The involvement of the French team was maintained at a high level throughout the exercise period, and team members participated enthusiastically. Confirmation of the technical feasibility and operational effectiveness of the communication systems is one of the main outcomes of this exercise. Nonetheless, the French team encountered difficulties in maintaining an appropriate language capability in English around the

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clock. This was identified as a major limiting factor in the event of an international emergency, and further linguistic capability has already been added to the team. Further necessary minor adjustments to the Response Plan have been identified and implemented.

#### *GERMANY*

Germany would like to thank Canada for the excellent preparation of this successful exercise. German players were pleased with their preparedness and decisions taken in response to the national public health emergency imposed by the exercise and gained valuable insights into national health emergency management.

Three teams each at the Federal Ministry of Health and Social Security and the Robert Koch-Institute worked rotating 8-hour shifts (seven persons per shift). The National Smallpox Plan proved to be very useful because of its flexibility, as an information resource and as guidance for decision making. The exercise also provided useful hints for further refinement of the Plan.

Players made use of any available communication tool. The complexity of communication issues during an international emergency provided information on a number of technical details that are currently being reviewed.

In summary, the exercise proved to be a valuable undertaking that not only provided information for improvement of national preparedness but also produced enthusiasm and further enhanced team spirit among the players.

#### *ITALY*

Italy enjoyed the exercise very much and expresses congratulations to the organizers, controllers, and players in all the participating countries. The material prepared for the Exercise Design Team was very useful for the preparation and training of players.

The exercise was also very useful to evaluate the capability of response at national level. Italy decided to also involve in the exercise other Administrations and Institutions, both civil and military. This approach was very useful to test the relationship between different authorities involved in an emergency management.

The exercise proved to be highly successful and was judged to be a good experience by all participants. The Italian players made national and international communications in a very timely manner, but problems were experienced in communication for teleconferences.

The GHSN website (with a specific section for the exercise) could have been used more intensively for communication between players but the use of the GHSN website for emergency communications should be assessed. Players (and controllers) received and sent direct phone calls amongst higher control, other controllers and players effectively. During the exercise the players communicated directly and by e-mail in a very smooth fashion. However, there were many technical difficulties with conference calls and audio/visual conferences.

The initial impressions collected from the players immediately after the end of exercise evidenced an increasing attention to international and national communications. Discussion among the national players was very lively and permitted an analysis of the Italian national plan in order to detect possible gaps in practicability in the real life of the directions provided by it, highlighting the strengths and weaknesses.

#### *JAPAN*

Japanese players were also pleased to be able to participate in the exercise, which provided an excellent opportunity to assess the present-status of preparedness against the major public health emergency.

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Japan's focus was the international communications and subsequent smooth implementation of the local plan of smallpox countermeasures. In order to meet the former demand, a group of roughly 12 persons provided the international communication and local exercise support at the central level. Three local governments (with approximately 20 players each) were involved for the national exercise.

Based on the both exercises, the national players identified the needs (1) to review the existing physical facilities and arrangements including telecommunication equipment, (2) to review the staffing allocation, and (3) to amend the national plan by adding more easy-to-use check lists and consideration for better international communication.

In summary, the players highly valued the exercise and believe that it brought an important step to strengthen both domestic and international preparation for the small pox disaster. Furthermore, the group saw this experience could be useful for other public health crises, such as chemical events.

#### *MEXICO*

Exercise GLOBAL MERCURY in Mexico was carried out with the participation of over 100 players and evaluators in five different institutions within the Ministry of Health (The General Directorate of Epidemiology, the National Center for Epidemiological Surveillance, the National Public Health Laboratory, the Institute for Epidemiological Diagnosis and Reference, and the General Directorate for Social Communication) and in the Secretariat of Health of the State of Baja California.

Each institution set up teams of at least nine players and nine evaluators, in order to cover three eight hour shifts during the exercise. Both players and evaluators participated from their institutions, setting up command centers equipped with telephone, fax and e-mail capabilities. Only one of the participant institutions has a dedicated command center.

Apart from the common exercise objectives, specific training objectives were set in Mexico which allowed for evaluating some aspects of the local response capability within the Ministry of Health including the usefulness of the national response plan to deliberate releases of biological agents.

The Mexican players got totally immersed in the exercise and responded generally according to the national plan, adequately improvising when a gap was found in the existing documents. With respect to the international communications there were some technical problems elsewhere described, however the most significant issue found is the language barrier.

National communications worked rather smoothly, although to the surprise of the evaluators, and in spite of its availability, e-mail was used only for transmission of documents and data and telephone conversations were by far the preferred means of communication between players.

Exercise GLOBAL MERCURY proved a very positive experience from the point of view of the national controllers, evaluators and players. It helped to highlight existing gaps in the preparedness and response to bioterrorism at the international, national and state levels, but it also helped participants to realize both the importance and usefulness of carrying out exercises of this sort in order to achieve adequate levels of organization and coordination between institutions.

Finally, rather than an end point, we should consider Exercise GLOBAL MERCURY as a stepping stone for generating a useful, effective organization for responding in an adequate and timely manner to the threat of bioterrorism worldwide.

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### *UNITED KINGDOM*

The United Kingdom found the exercise extremely useful in testing and developing the national smallpox plan and the operational coordination that supports it. The international communications added a new dimension to the earlier work on the plan, particularly when countries reached different strategic decisions about vaccination policy. The United Kingdom operated as a Department of Health Team supported by the Health Protection Agency Team which provided the advice for, and the implementation of, operational decisions. This worked very well and reinforced the need for dedicated and well equipped operations centres.

The United Kingdom players responded to the exercise injects rapidly and methodically ensuring onward transmission of internationally important information through telephone and email. The players expressed views at the immediate post exercise covering the following main areas.

It was felt that international communication should begin with a suspected case of smallpox rather than a laboratory confirmed case. This will require rehearsal and test communications between countries. However, we do recognise the probable effects of exercise time compression.

Telephone conference preparation, organisation and the technology that supports it could be further improved by more practice.

In a real event there would be many more referrals from the media

The players have requested that we run an international exercise every year.

The exercise was considered to be a resounding success by all the players and the United Kingdom expresses its gratitude to the Canadian exercise planners for their meticulous preparation.

### *UNITED STATES*

The GLOBAL MERCURY command post exercise was a valuable test for both internal and external communications, as well as providing the U.S. Department of Health and Human Services (HHS) the opportunity to identify areas where additional international coordination and cooperation is required to assure an effective global health response.

U.S. participation in the GLOBAL MERCURY exercise included a number of agencies and offices - the HHS Secretary's Command Center, the Office of the Assistant Secretary for Public Health Emergency Preparedness, Office of Global Health Affairs, the Centers for Disease Control and Prevention, National Institutes of Health and the Food and Drug Administration. Additionally, the U.S. Department of State (DOS) participated in the exercise.

The exercise provided a unique opportunity for HHS and DOS to work collaboratively on issues surrounding an international, intentional, contagious disease outbreak. The exercise was also valuable as it allowed HHS Operating Divisions (e.g. CDC, FDA, the Immediate Office of the secretary and NIH) to practice relevant policies and procedures related to the roles and responsibilities that pertain to international public health emergencies.

### *THE WHO*

The World Health Organization found the GLOBAL MERCURY Exercise very useful to further refine established internal response protocols in the post-SARS environment. The issues and problems arising during the conduct of the exercise served to confirm and reinforce the WHO role as the lead agency for information collection and dissemination. The "multi-point network" model for communications utilized in the exercise led to gaps and duplications in information flow, which resulted in disparities in the availability of crucial information for players' decision-making processes. The conse-

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quences emphasized the need for a body to co-ordinate international communications and information exchange.

The exercise also helped us to audit and validate our internal working practices devised and implemented since the SARS outbreak, and to identify areas requiring enhancement, including augmentation and redirection of human, communications and logistical resources for response to a global health event.

*THE EUROPEAN COMMISSION*

The exercise generated valuable action points for a real situation. A total of 10 players participated, allowing them to test most elements of the EU Rapid Alert System "Bichat". This communication system between the EU Member States is in operation since more than a year and proved to be efficient, but some technical improvements will be required, such as the internal communication within the response team during a large-scale event. Definitions such as the "incident scale" will need to be improved. Phone conferencing proved to be an efficient multi-lateral communication tool, while the management of e-mail traffic proved to be cumbersome. Making information quickly available on web-pages would limit this bottleneck.

As an observer from only one side, it is difficult to judge how timely the communications were. In exercise time, the EC was informed of the cases only three days after the passenger was spotted in Canada - it is clear that a wider public health communication tool is needed.

It was valuable to notice that adequate exchange of information on implemented national measures was possible. Participating EU Member States concentrated on the implementation of their national plans. In terms of management of the actual EU-wide public health response, a common strategy to combat the outbreak did not emerge, despite open communication lines among the EU-players. The international aspects of national measures taken were seldom, if ever, discussed.

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## SECTION 6 – LESSONS LEARNED

### INTRODUCTION

This section of the report draws on the observations and reports provided during the exercise by the exercise control staff, feedback provided by the evaluators in conjunction with the exercise players immediately following the exercise and the lessons learned identified by the exercise controllers and evaluators.

### SUMMARY OF LESSONS LEARNED

There are four major lessons to be drawn from the exercise:

- the difficulties involved with international exchange of information during an emergency;
- the lack of “international perspectives” in national smallpox plans;
- a requirement for common terminology to describe the magnitude and extent of a public health emergency; and
- the need for robust and reliable communication systems that are tested on a regular basis.

### LESSONS LEARNED

#### *PROTOCOLS FOR INTERNATIONAL COMMUNICATIONS DURING A HEALTH EMERGENCY*

Exercise GLOBAL MERCURY showed that the “star” communication configuration<sup>7</sup> is less than ideal. It imposes the burden of exercising control on the busiest respondent, which is simultaneously trying to manage a national response to the health risk that has caused the emergency situation. The limited staff capacity available in the affected nation’s emergency response structure is quickly overwhelmed by the international duties that accrue to it in addition to the national responsibilities that it must fulfill.

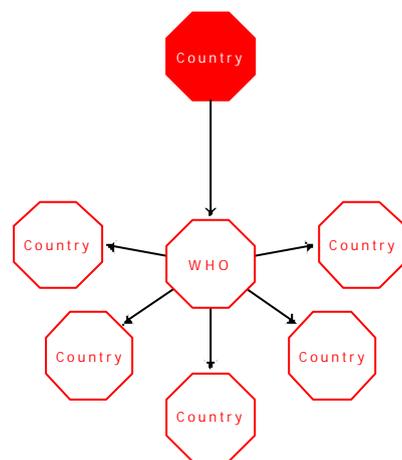


Figure 6 - The Sunburst Structure

This was true even in the limited scope of Exercise GLOBAL MERCURY, wherein there were only ten players. In a real event such as that depicted in the exercise, every nation in the world could conceivably be seeking information, advice and material assistance and would (conceptually) be contacting the first-affected nation for outbreak information updates. This could compromise global exchanges of public health information at a critical juncture.

The sunburst structure would be more robust to meet the global communication needs that would arise from a real attack on several nations using an agent such as smallpox. In our view, the World Health Organization should be designated the hub in this communication structure. Not only is the WHO the most logical agency to

undertake the task of information management in respect of a global health emergency, use of the WHO as the communications coordinator and regulator would free the affected nation(s) to concentrate on their most immediate concern – containment of and countermeasures to the health emergency. Participants consider it essential that WHO allocate sufficient resources to ensure the capacity to exercise this role if faced with an international outbreak of smallpox.

<sup>7</sup> See Section 3 for a description of the ‘star’ and ‘sunburst’ communications structure.



We noted that player nations had different national structures to deliver similar functions during a public health emergency. This meant that an understanding of each others' systems would improve communications.

#### *NATIONAL PLANS*

During the second meeting of the Exercise Planning Group (held in Mexico in conjunction with the GHSAG Minister's Meeting in early December 2002) GHSAG nations shared information about their national plans to deal with a smallpox outbreak. Completeness and details of the plans varied, and it was noted that there was considerable variation in the ways in which national plans dealt with the international aspects of an outbreak.

Some plans mentioned reporting a smallpox event to the WHO but other aspects such as international sharing of vaccine stockpiles; VIG or other resources were not addressed.

Countries adopted different approaches to smallpox vaccination. Participants recognize the importance of sharing the rationale for vaccination strategies or other control measures in advance of their implementation.

#### *USE OF COMMON TERMINOLOGY*

Players encountered some difficulties with the use of different terms to categorize the state of the emergency. The Risk Incident Scale (currently under development) saw limited use during the exercise and requires further refinement for dealing with an outbreak of smallpox.

As well, technical terms such as "possible", "suspect" and "confirmed" were used and interpreted to have slightly different meanings, resulting in additional effort to resolve the intentions of the players. This problem was exacerbated by language differences. Development of a comprehensive situational analysis requires the existence of a common vocabulary.

#### *EFFECTIVE AND RELIABLE TECHNICAL SUPPORT*

There were a number of technical difficulties experienced during the course of the exercise - telecommunications, audio/visual conferences and email exchanges.

Direct one-to-one telephone calls were on the most part successful (although subject to some difficulties common with international calls) but all-party conference calls were never successfully established to the point where all players were able to communicate effectively with one another.

Although attempts were made to establish audio/visual conferences between the players that had that capability, it is obvious that further efforts will be required to establish and maintain an international capacity in this communication means.

Email exchanges were used extensively and initially proved to be an effective means of information exchange. There were often delays in responding to requests (perhaps due to the compression of time during the exercise).

#### *CONCLUSION*

The preparation for and conduct of this first international public health smallpox exercise provided valuable opportunities for all participants involved to evaluate their capacity for communicating in an emergency situation.

Exercise GLOBAL MERCURY provided valuable information about the timing and extent of (and reasoning for) counter measures taken by the nations involved. It also provided an opportunity for building trust, facilitated discussion of various plans and strategies, and permitted nations to assess their readiness to counter a smallpox outbreak.

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Although the exercise was conducted mainly on a technical level within the ministries, extrapolating from the exercise indicates to a degree what reactions might be in a real emergency.

Overall, the results were worth the effort. Participants felt that exercise objectives were met and that the exercise provided an opportunity to further strengthen international public health coordination among the exercise participants.





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## SECTION 7 - RECOMMENDATIONS

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### INTRODUCTION

The comments and recommendations that follow are based on the results of the exercise, suggestions from the players and the observations and experiences of the EPG and the exercise design team.

### CONTROL OF AN INTERNATIONAL PUBLIC HEALTH EMERGENCY

The exercise demonstrated the importance of a central coordinating body for managing public health information exchange during an international public health emergency.

- **Recommendation 1** - Members of the GHSI recognised the mandate of WHO places the Organization in a strong position to undertake information collection, dissemination and effective coordination of action in the event of a public health emergency of international concern and urges the Director General to keep under review the priority and resourcing of this activity.

### INTERNATIONAL COMMUNICATIONS PROTOCOLS

**Recommendation 2** - The GHSAG should establish a mechanism for rapid international communications between the exercise participants. Future tests should be scheduled (on an ongoing basis) to assure that technical challenges do not hinder communications between the countries/organizations likely to be involved in an international public health emergency.

### NATIONAL SMALLPOX PLANS

**Recommendation 3** - National smallpox plans should be reviewed and the critical international aspects enhanced.

**Recommendation 4** - GHSAG members are encouraged to share emergency response guidelines, functions and structures to facilitate international communication.

### COMMON TERMINOLOGY

**Recommendation 5** - The GHSAG should refer discussions on common terminology to the Field Epidemiology Working Group.

### TECHNICAL SUPPORT

**Recommendation 6** - The EPG recommends that member countries/organizations periodically evaluate their infrastructure and systems for international information exchange during public health emergencies.

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**ANNEX A – MEMBERS OF THE EXERCISE PLANNING GROUP**

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The following individuals made up the Exercise Planning Group:

**Canada**

Dr. Ron St. John	Chair EPG and Exercise Director
Mr. A.D. (Sandy) McQuarrie	Leader, Exercise Design Team and Deputy Exercise Director
Mr. W.J. (Joe) Aitchison	Senior Exercise Planner/Controller
Mr. E.B. (Ernest) Beno	Senior Exercise Planner/Controller

**France**

Prof J.F. Lacronique	Trusted Agent/Controller
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**Germany**

Dr. Michael H. Kramer	Trusted Agent/Controller
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**Italy**

Dr. Giuseppe Ippolito	Trusted Agent/Controller
Dr.ssa Dina Caraffa de Stefano / Loredam Vellucci	Trusted Agent/Controller Trusted Agent/Controller

**Japan**

Dr. Hiroki Nakatani	Trusted Agent/Controller
Dr. Kiyosu Taniguchi	Trusted Agent/Controller

**Mexico**

Dr. Pablo Kuri-Morales	Trusted Agent/Controller
Dr. Miguel Betancourt-Cravioto	Trusted Agent/Controller

**United Kingdom**

Dr. Graham Bickler	Trusted Agent/Controller
Dr. Nigel Lightfoot	Trusted Agent/Controller

**United States**

Dr. Karen Becker	Trusted Agent/Controller
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**World Health Organization**

Dr. Cathy Roth	Trusted Agent/Controller
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**European Commission**

Dr. Frank Van Look	Trusted Agent/Controller
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ANNEX B – INTERNATIONAL HEALTH EMERGENCY NUMBERS

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Prior to the initiation of the exercise, the players realized that they lacked a list of emergency centre contact points and numbers. Efforts to gather these numbers began almost simultaneously in many different countries about four weeks prior to the exercise start date.

We found that many versions were produced and the obvious conclusion was that exercise players would likely have difficulty in establishing the actual numbers required to ensure contact with other international players.

To overcome what the EPG foresaw as a potential serious problem and to ensure that exercise players had a common list of numbers to use, the exercise design team developed an exercise contact list that was distributed to all players on the day prior to the exercise start date.

A suggested format for a template to incorporate and distribute actual contact numbers is attached.

This template could be used for initial contact purposes but it should be amended and re-distributed as one of the initial steps in an emergency management process as individual nations may set up specific organizations to respond.

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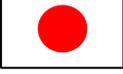
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**Emergency Contact Numbers**

**Public Health Emergency Facilities**

Country / Organization	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Ottawa</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Paris</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Berlin</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Rome</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Tokyo</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Mexico City</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>London</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Washington</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Luxembourg</b>	Primary Contact No (Working Hours)	Secondary Contact No (Non-working Hours)	Facsimile No	Mobile 1	Mobile 2	E-mail Address
						
<b>Geneva</b>						