

Neither Here Nor There
Disease Outbreak Data in the
Confidence Building Measures under the Biological Weapons
Convention and in Open Sources

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The aim of the Research Group for Biological Arms Control is to contribute, through innovative research and outreach activities, to the universal prevention of biological weapon development, production and use. The development of new strategies, concepts and methods for verification and ensuring compliance is the core research area of the Group.

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Abstract

Unusual outbreaks of diseases have long been regarded as a possible indication of bioweapons development or use. For this reason, the annual declarations in the framework of the Bioweapons Convention (BWC) – the Confidence Building Measures (CBMs) – include under CBM Form B the requirement to provide information on unusual outbreaks of diseases and background information on reportable infectious diseases. In this paper, the data declared under CBM Form B is summarized and compared with open source information.

Between 2001 and 2005 only about one third of all BWC Member States submitted a CBM and even fewer included background information about disease outbreaks in their territory. Comparison of data submitted under CBM Form B (i) with open source information led to the conclusion that disease data is often not declared and if it is, it is mostly inaccurate and incomplete.

Out of a total of 93 countries that have submitted a CBM between 1987 and 2005, 20 submitted a Form B (ii). These 20 states submitted 53 Form B (ii) declarations with 92 reported outbreaks. Of the 92 reported unusual outbreaks, one was declared as an act of bioweapon usage: in the CBM declaration of 1997 Cuba alleged the USA of spreading *Thrips palmi*, a crop destroying insect, on Cuban territory. Comparing data submitted under CBM Form B (ii) with open source information posed problems because an unusual outbreak as defined in the CBMs is not necessarily an outbreak relevant to Article I of the BWC.

Although one possibility of recognizing violations of the BWC is the occurrence of unusual disease outbreaks, it is open to question whether CBM Forms B (i) and B (ii) in their current form are suited for this purpose. It is the opinion of the author that the routine collection of disease outbreak data although relevant towards transparency for an arms control regime should happen in a public health setting such as the WHO. However, as long as no comprehensive global disease database exists, CBM Form B (i) should be kept, because in certain cases it provides information not available elsewhere.

As a contribution to transparency the author recommends that countries submit – under a revised CBM Form B (ii) – declarations on events of biosecurity concern, like accidents in biodefence facilities and incidents with weaponized biological material even if nobody was infected. Such a narrowly focussed CBM Form B (ii) declaration would provide a global picture of events of biosecurity concern and therewith be directly relevant to the BWC.

1. Introduction

Unusual outbreaks of diseases have long been regarded as a possible indication of bioweapons development or use. Following an accident in 1979 in a Soviet military facility in Sverdlovsk (now Yekaterinburg, Russia) and the long struggle to gain facts about the following anthrax outbreak, States Parties to the Biological and Toxin Weapons Convention (BWC) agreed in 1986 to exchange information on unusual outbreaks of infectious diseases and similar incidents caused by toxins, in order to prevent or reduce the occurrence of ambiguities, doubts and suspicions. This information exchange takes place in the framework of the annual data declarations.

These annual declarations – the Confidence Building Measures (CBMs) – were agreed by States Parties in 1986 as a multilateral transparency generating tool to strengthen confidence in compliance with the Convention.¹ During the Third Review Conference in 1991, States Parties agreed on an extension of the CBMs. Since then, they have stayed unchanged and cover the following topics:²

- **Form 0** - Declaration form on “Nothing to Declare” or “Nothing New to Declare”.
- **Form A, Part 1** - Exchange of data on research centers and laboratories.
- **Form A, Part 2** - Exchange of information on national biological defence research and development programmes.
- **Form B** - Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins.
- **Form C** - Encouragement of publication of results and promotion of use of knowledge.
- **Form D** - Active promotion of contacts.
- **Form E** - Declaration of legislation, regulations and other measures.
- **Form F** - Declaration of past activities in offensive and/or defensive biological research and development programmes.
- **Form G** - Declarations on vaccine production facilities.

CBM Form B, which deals with outbreaks of diseases, is separated into two parts: Form B (i) on “Background information on outbreaks of reportable infectious diseases” requiring case numbers for the last five years, and Form B (ii) on “Outbreaks of infectious diseases and similar occurrences that seem to deviate from the normal pattern”, taking the form of a questionnaire that asks for a more detailed description of the reported unusual biological incident. Figure 1 shows the head of Form B (i). Figure 2 shows Form B (ii).³

After almost 20 years of collecting CBM data, there is still no evaluation of the submitted data and the submission of a CBM seems more a voluntary act than an obligation under the BWC. Until now, 159 states have joined the BWC but, for example, in 2007, only 64 states submitted a CBM and even fewer provided information about disease outbreaks in their territories.⁴

In this paper, the data declared under CBM Form B are summarized and compared with open source information. Analysing CBM Form B in this way reveals how much effort countries put in compiling the information they submit and how openly they handle information about the health status of their people, livestock and plant population. This paper necessarily has to look into –

¹ Final Declaration of the Second Review Conference of the Biological and Toxin Weapons Convention, 1986, BWC/CONF.II/13/II, p. 7.

² Annex on Confidence Building Measures to the Final Declaration of the Third Review Conference of the Biological and Toxin Weapons Convention, 1991, BWC/CONF.III/23, Part II, Annex.

³ The CBM forms are available at http://www.opbw.org/assorted/action_docs/CBM_Forms.pdf.

⁴ Information about the BWC, its member states, and CBM participation is available at <http://www.unog.ch/bwc>.

and provides information on – what open sources of disease outbreak data exist and how they compare to each other. Finally, the paper makes recommendations for changes to CBM Form B in order to increase the quality and usability of the declared data.

Figure 1. Head of CBM Form B (i)

<u>Form B (i)</u>					
<u>Background information on outbreaks of reportable infectious diseases</u>					
Disease	Number of cases per year				
	1988	1989	1990	1991	1992

The overall aim of the paper is to contribute to the improvement of the CBM mechanism under the BWC. To build confidence between the States Parties it is necessary to enhance transparency and the CBMs are one of the tools available to do this. It is important to analyse CBM submissions in detail in order to make the CBM topics more precise, and to revise the CBMs in a way that presents the declared data more uniformly and therewith makes them easier to compare and the CBM mechanism more efficient. Comparing the data declared in the CBMs to open source data is one way of evaluating their accuracy. Such an analysis could encourage more States Parties to submit an accurate CBM Form B.

2. Methodology

This paper analyses the information provided in CBM Form B (i) submitted during the years 2001 to 2005 and in CBM Form B (ii) submitted during the years 1987 to 2005. It compares the data provided in the CBMs to open source data to assess correctness and completeness. It also compares the declarations of individual states in different years to each other to assess consistency.

This paper does not provide a statistic of disease occurrence in States Parties but it does assess a trend in accuracy and completeness of the submitted CBM Forms B (i) and B (ii). No effort is made to come to any conclusions why particular information might be missing or incorrect.

Although the analysis of the declared data was carried out with utmost care, due to the large amount of data mistakes may still have happened. The author appreciates receiving comments and corrections at anna.zmorzynska@uni-hamburg.de.

Figure 2. CBM Form B (ii)

<u>Form B (ii)</u>	
<u>Information on outbreaks of infectious diseases and similar occurrences, that seem to deviate from the normal pattern</u>	
1.	Time of cognizance of the outbreak
2.	Location and approximate area affected
3.	Type of disease/intoxication
4.	Suspected source of disease/ intoxication
5.	Possible causative agent(s)
6.	Main characteristics of systems
7.	Detailed symptoms, when applicable
	- respiratory
	- circulatory
	- neurological/behavioural
	- intestinal
	- dermatological
	- nephrological
	- other
8.	Deviation(s) from the normal pattern as regards
	- type
	- development
	- place of occurrence
	- time of occurrence
	- symptoms
	- virulence pattern
	- drug resistance pattern
	- agent(s) difficult to diagnose
	- presence of unusual vectors
	- other
9.	Approximate number of primary cases
10.	Approximate number of total cases
11.	Number of deaths
12.	Development of the outbreak
13.	Measures taken

2.1. Analysing CBM Form B (i)

CBM Form B (i) asks for “Background information on outbreaks of reportable infectious diseases” and requires states to declare case numbers of diseases for the last five years. To focus analysis of CBM Form B (i), the number of diseases looked at was limited to ten bioweapon relevant ones. The selected ten diseases represent all six Category A and two Category B diseases as defined by the US Centers for Disease Control and Prevention (CDC) and two animal diseases from the old List A as defined by the World Organisation for Animal Health (OIE).⁵ Anthrax (*Bacillus anthracis*), botulism (*Clostridium botulinum* toxin), plague (*Yersinia pestis*), smallpox (variola major), tularemia (*Francisella tularensis*) and Crimean-Congo haemorrhagic fever as representative of the group of viral haemorrhagic fevers are the Category A diseases. As representatives of Category B diseases Q fever (*Coxiella burnetii*) and brucellosis (*Brucella* species) were chosen. As animal disease representatives foot and mouth disease (FMD) and rinderpest were selected.

For this paper, disease data from the years 2000 to 2004 were analysed, which means that the CBMs submitted from 2001 to 2005 were used. This limited time period was chosen in order to maintain manageability of the amount of data while at the same time studying the most recent data available to the author.

Open sources used for comparison purposes were online sources of the World Health Organisation (WHO), WHO Regional Offices, and the OIE. For additional information, CDC publications and the ProMED-mail database were searched.⁶ The open sources used are listed in the beginning of each disease specific section of chapter 3 below.

Finding reliable open source information was not as easy as one would imagine. Online statistics on disease outbreaks are hard to find and are often incomplete. One of the databases identified was the WHO Global Health Atlas which provides statistical information about disease case numbers sorted by year and country.⁷ However, only the following eight infectious diseases are covered: cholera, HIV/aids, influenza, malaria, poliomyelitis, rabies, tuberculosis und yellow fever. Besides the fact that this database does not cover the diseases of interest for this paper, the data in it are often incomplete and many countries’ data are missing without providing an explanation why.

The Centralized Information System for Infectious Diseases (CISID)⁸ of the WHO Regional Office for Europe is the one example that could be identified of an open source online database with extremely detailed statistical information. However, even within WHO, data are not consistent; when comparing the data in the CISID with data from other WHO publications discrepancies between the two datasets become evident.

All the open source data used for comparison purposes in the case of animal diseases were taken from the OIE World Animal Health Information Database (WAHID).⁹ This database contains very detailed statistical information about every disease on the OIE list sorted by disease, country and year.

⁵ See U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), Bioterrorism Agents/Diseases, <http://www.emergency.cdc.gov/agent/agentlist-category.asp>; and World Organisation for Animal Health, Old Classification of Diseases Notifiable to the OIE, http://www.oie.int/eng/maladies/en_OldClassification.htm.

⁶ The CDC website, <http://www.cdc.gov>, was searched for publications on disease outbreaks including case numbers. The ProMED-mail online database is available at <http://www.promedmail.org>.

⁷ Available at <http://www.who.int/globalatlas/DataQuery/default.asp>.

⁸ Available at <http://data.euro.who.int/cisid/>.

⁹ Available at <http://www.oie.int/wahid-prod/public.php?page=home>.

In chapter 3 below a summary of the comparison of CBM data and open source data is provided for each of the ten diseases selected for analysis. Because it was not possible to find open source information about disease case numbers for all BWC States Parties and all ten diseases, this comparison necessarily is limited to the countries and diseases for which open source information could be identified. In each disease specific summary, the countries that declared case numbers for that disease under CBM Form B (i) and for which open source information for this disease was available are listed in bold letters in the beginning. Countries for which no open source data could be identified are listed in normal font. Obviously, it is not possible to draw a conclusion about the completeness and correctness of data reported under Form B (i) for which no open source information could be identified.

Each summary lists differences between the data provided in the CBMs and open source information, discrepancies between CBM data of different years, and differences between open source data sets. It also lists countries that – according to open sources – had cases of the respective disease but either did not declare them although they submitted a CBM, or did not submit a CBM at all.

2.2. Analysing CBM Form B (ii)

CBM Form B (ii) asks for “Information on outbreaks of infectious diseases and similar occurrences that seem to deviate from the normal pattern” and requires states to declare details of unusual outbreaks of diseases such as location, time, case numbers and detailed symptoms. To focus analysis of CBM Form B (ii), only diseases caused by Risk Group III and IV pathogens as defined by the European Union were looked at.¹⁰

The analysis of CBM Form B (ii) covers the entire period of CBM submissions until 2005. The 2005 submissions are the most recent CBM data available to the author.

Open sources were searched for disease outbreaks caused by pathogens of Risk Groups III and IV. The outbreaks identified were judged to be unusual if they met one or more of the criteria listed in the CBMs.¹¹ These criteria are:

- The causative agent is exotic to a given region.
- The cause of the outbreak cannot be readily determined or the causative agent is difficult to diagnose.
- The disease follows an unusual pattern of development.
- The possible occurrence of a new disease.

The unusual outbreaks identified in this way from open sources were then compared to the data declared in CBM Form B (ii).

Open sources used for comparison purposes were firstly the WHO Disease Outbreak News¹² which provide information about disease outbreaks worldwide from 1996 onwards. The WHO Disease Outbreak News are short messages that can be sorted by year, disease or country. Secondly, ProMED-mail¹³ – a global electronic reporting system for outbreaks of diseases – was used. ProMED-mail publishes information in the form of small postings. The archives go back

¹⁰ Directive 2000/54/EC of the European Parliament and of the EU Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work. Available at: http://bccm.belspo.be/about/mucl_directive_200054EC.pdf.

¹¹ Annex on Confidence Building Measures to the Final Declaration of the Third Review Conference, 1991, BWC/CONF.III/23, Part II, Annex.

¹² Available at <http://www.who.int/csr/don/en/>.

¹³ Available at <http://www.promedmail.org>.

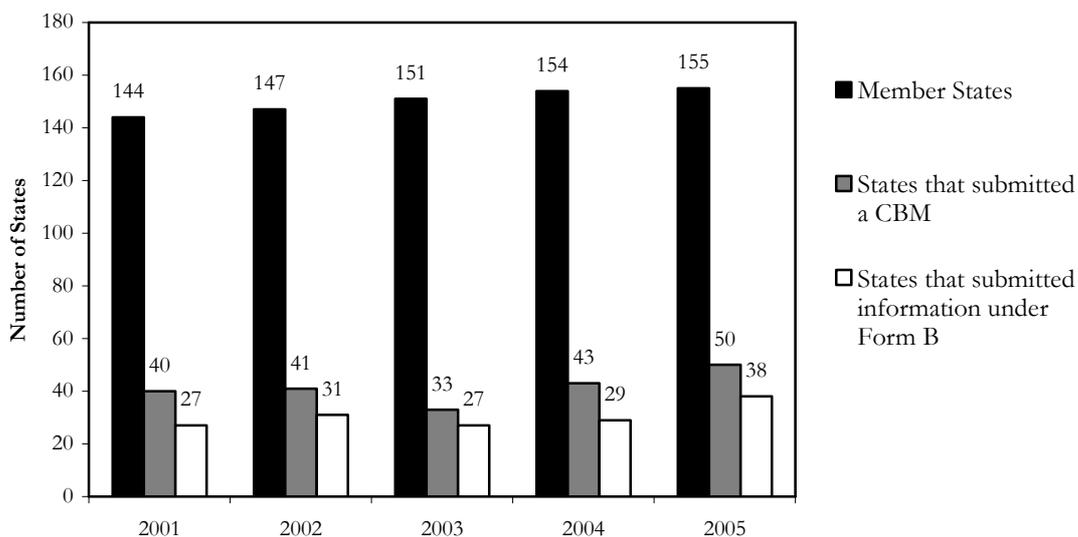
until 1994 and can be searched by keywords. The ProMED-mail archives include a larger amount of information than the WHO Disease Outbreak News but the information is not evaluated to the same degree before it is put online.

3. Analysis of declared data and comparison with open source information

3.1. Participation in data exchange

Of the more than 150 States Parties that existed at the time 61 states participated in the information exchange between 2001 and 2005. 45 of those states provided information under Form B at least once. For the period 2001 to 2005, figure 3 shows the number of States Parties, the number of states that submitted CBMs, and the number of states that provided information under CBM Form B, per year. Sixteen states which submitted at least one CBM during this time period never declared any information under CBM Form B. Some of those states used Form 0 to state “nothing to declare” or “nothing new to declare” under Form B.

Figure 3: Submission of CBM Form B in comparison with overall CBM submission and BWC membership



3.2. Analysing CBM Form B (i): Human Diseases

CBM Form B (i) submissions differ greatly in quality and quantity. The quantity varies from submissions in which case numbers for a single disease for one year are declared to submissions in which over hundred diseases and up to ten years are covered. Neither of these two extremes represents an ideal Form B (i) submission.

The data provided in Form B (i) often lack explanation thereby leaving room for interpretation. It is for example not clear, whether a blank cell means that there were no cases or rather that there is no information available e.g. because the disease is not notifiable. It is also not always obvious whether outbreaks or case numbers are declared. One example are the Romanian Form B (i) declarations where animal disease data are declared in the following form: “155/4613” with a caption reading “117/117 outbreaks in wild animals”. This is ambiguous and leaves much room for interpretation. Other examples of inconsistencies in Form B (i) declarations from 2001 to 2005 are:

- Korea declared 2001 two times the same list of diseases. The title of the table in CBM Form B (i) says “Number of cases per year” but the columns are entitled “outbreaks” and “deaths”.
- Italy’s list of diseases started with the letter “L” in 2002.
- Poland is only declaring data for its armed forces.
- Poland declared only with the ICD10 codes and not the disease name in 2001.
- Croatia declared Form B (i) data under Form B (ii) and vice versa.
- Morocco declared in 2005 under Form B (i) only animal diseases. Human diseases were declared under Form G.

An additional complication is that some states, e.g. Sweden and Italy, provide lists of disease case numbers in their national language even though they are not official UN languages.

Figure 4 shows the number of states that declared disease data in the CBMs and/or in open sources. On the one hand a lot of data available in open sources was not declared in the CBMs. On the other hand some data were available through the CBMs where no open sources could be identified. In these cases the CBM mechanism is providing additional information about worldwide disease outbreaks.

The following sections provide disease specific detail. In the beginning of each disease specific section below, the countries that declared case numbers for that disease under CBM Form B (i) and for which open source information for this disease was available are listed in bold. Countries for which no open source data could be identified are listed in normal font.

Figure 4: Number of BWC Member States that declared disease outbreaks for the years 2000 until 2004 in the CBMs and/or elsewhere

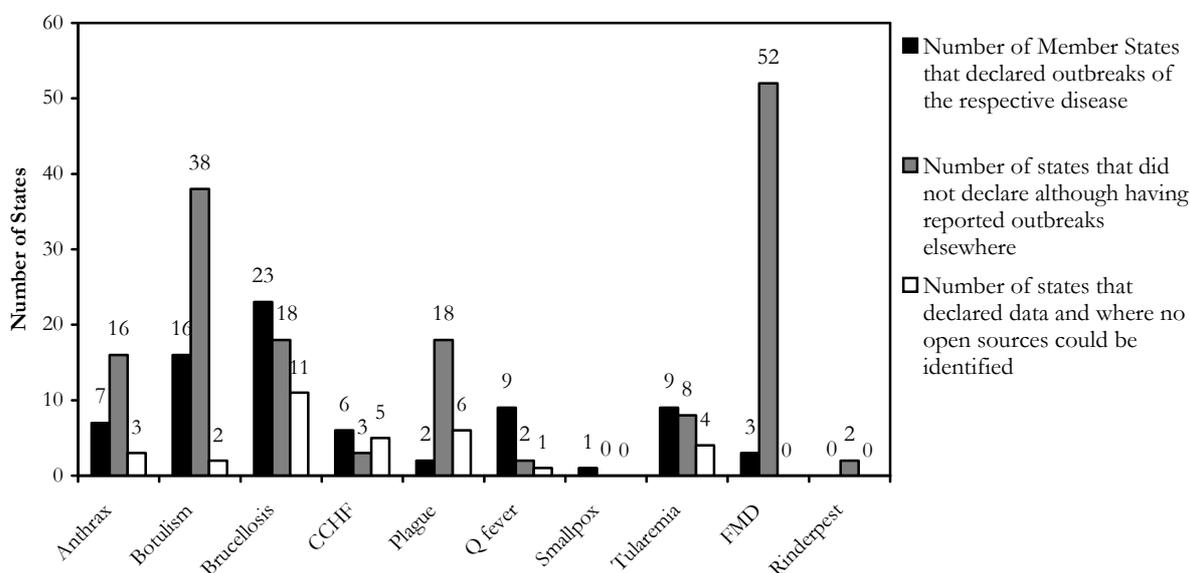


Figure 4: For Botulism, Brucellosis, CCHF, Q fever and Tularemia there were no open source data found except in the WHO Disease Outbreak News and in the CISID which provides information for European countries only. No conclusion can be made about disease outbreaks in States Parties for which no open source material was found. Therefore, some of the grey bars might in fact be higher.

3.2.1. Anthrax

Sources: CISID, World Anthrax Data Site,¹⁴ WHO Disease Outbreak News.

The World Anthrax Data Site provides information only until the year 2001 with no indication until which month of 2001 the data was collected, and whether only “natural” cases are counted. Only two cases are listed for 2001 in the USA. In CBM Form B (i) the United States declared 22 cases, which is the expected number given the available information on the anthrax letter attacks. CISID data and the data of the World Anthrax Data Site differ sometimes.

The following States Parties provided information on anthrax: Argentina (2005, 2004, 2003, 2002), **Australia** (2005, 2004, 2003, 2002, 2001), **Bulgaria** (2005, 2004, 2003, 2002, 2001), Canada (2002, 2001), **Croatia** (2004), **Finland** (2005, 2004, 2003, 2002, 2001), **Georgia** (2005), **Germany** (2005, 2004, 2003, 2002, 2001), **Hungary** (2005, 2004), **Ireland** (2005), **Japan** (2005, 2004, 2003, 2002, 2001), **Libya** (2005), **New Zealand** (2005, 2004, 2003, 2002, 2001), **Norway** (2005, 2004, 2003, 2002), **Republic of Korea** (2005), **Romania** (2004, 2003, 2002, 2001), South Africa (2005, 2004, 2003, 2002), **Sweden** (2005), **Switzerland** (2005, 2004, 2003, 2002, 2001), **Turkey** (2005), **USA** (2005, 2004, 2003, 2002, 2001).

The following States Parties had registered cases of anthrax in open sources but did not provide a Form B (i) or had not listed anthrax, although they have submitted a CBM: Armenia, Chile, France, Greece, Hungary, Iran, Peru, Poland, Romania (declared only animal cases), Russian Federation, Serbia/Montenegro, Slovakia, Spain, Turkmenistan, United Kingdom, Uzbekistan.

The following States Parties have not submitted a CBM but cases of anthrax were mentioned in open sources: Ethiopia (2000).

Data discrepancies:

- Croatia declared in its 2004 CBM one anthrax case for the year 2000. The CISID as well as the World Anthrax Data Site list two cases for that year.
- Georgia declared in its 2005 CBM 17 (2004), 6 (2003), 4 (2002), 18 (2001) and 20 (2000) cases of anthrax. The CISID and the World Anthrax Data Site (data for 2001 and 2000 only) list 45 (2004), 27 (2003), 15 (2002) 26 (2001) and 29 (2000) cases of anthrax infections.
- Republic of Korea declared in its 2005 CBM zero cases but in the World Anthrax Data Site 5 cases are registered.
- The case numbers declared in Turkey’s CBM of 2005 – 398 (2002) and 521 (2001) – differ slightly from the case numbers in the CISID – 395 (2002) and 532 (2001).

3.2.2. Botulism

Sources: CDC, CISID, WHO Disease Outbreak News.

The following States Parties provided information on botulism: Argentina (2005, 2004, 2003, 2002, 2001), **Australia** (2005, 2004, 2003, 2002, 2001), **Bulgaria** (2005, 2004, 2003, 2002, 2001), Canada (2005, 2004, 2003, 2002, 2001), **Estonia** (2005, 2004, 2003, 2001), **France** (2001), **Georgia** (2005), **Germany** (2005, 2004, 2003, 2002, 2001), **Italy** (2005, 2004), **Lithuania** (2005,

¹⁴ Available at <http://www.vetmed.lsu.edu/whocc/index.htm>.

2004, 2003, 2001), **Netherlands** (2005, 2004, 2003, 2002, 2001), **Norway** (2005, 2004, 2003, 2002), **Poland** (only for the armed forces for 2005, 2004, 2003, 2002, 2001), Republic of Korea (2005), **Sweden** (2005), **United Kingdom** (2005, 2004, 2003, 2002, 2001), **USA** (2005, 2004, 2003, 2002, 2001).

The following States Parties had registered cases of botulism in open sources but did not provide a Form B (i) or had not listed botulism, although they have submitted a CBM: Armenia, Austria, Belarus, Belgium, Croatia, Czech Republic, Denmark, France, Greece, Hungary, Italy (only for 2003 and 2004), Latvia, Lithuania (only for 2001), Poland, Romania, Russia, Serbia/Montenegro, Slovakia, Slovenia, Spain, Switzerland and Turkey.

Data discrepancies:

- Georgia declared in its 2005 CBM 25 (2004), 23 (2003), 23 (2002), 12 (2001) and 20 (2000) cases of botulism. The case numbers given by the CISID are 46 (2004), 39 (2003), 39 (2002), 34 (2001) and 39 (2000).
- Lithuania declared in its 2001 CBM 226 cases of botulism for the year 2000. The CISID listed only 15 cases.
- Norway declared in its 2005 CBM 34 (2004), 40 (2003), 32 (2002), 11 (2001) and 38 (2000) cases. In 2004 it declared 6 (2003), 1 (2002), 0 (2001) and 1 (2000). The 2005 declaration matches the case numbers given in the CISID.
- The USA declared in their 2005 CBM 116 (2004), 119 (2003) and 118 (2002) cases. This differs slightly from the numbers of the US CDC which are 138 (2004), 126 (2003) and 118 (2002).

3.2.3. Brucellosis

Sources: CDC, CISID, WHO Disease Outbreak News.

The following States Parties provided information on brucellosis: Argentina (2005, 2004, 2003, 2002), Australia (2005, 2004, 2003, 2002, 2001), **Bulgaria** (2005, 2004, 2003, 2002, 2001), Canada (2005, 2004, 2003, 2002, 2001), Cuba (2005, 2004, 2003, 2002, 2001), **France** (2001), **Georgia** (2005), **Germany** (2005, 2004, 2003, 2002, 2001), **Ireland** (2005), **Italy** (2005, 2004, 2003), Japan (2005, 2004, 2003, 2002, 2001), Libya (2005), **Lithuania** (2005), Morocco (2005), **Netherlands** (2005, 2004, 2003, 2002, 2001), New Zealand (2005, 2004, 2003, 2002), **Poland** (2005), Republic of Korea (2005), **Romania** (2004, 2003, 2002, 2001), South Africa (2005, 2004, 2003, 2002), **Spain** (2005, 2004, 2003, 2002, 2001), **Sweden** (2005), **Switzerland** (2005, 2004, 2003, 2002, 2001), **Turkey** (2005), USA (2005, 2004, 2003, 2002, 2001).

The following States Parties had registered cases of brucellosis in open sources but did not provide a Form B (i) or had not listed brucellosis, although they have submitted a CBM: Armenia, Austria, Belarus, Belgium, Croatia, Finland, France, Georgia (only for 2004, 2003, 2002), Greece, Hungary (except for 2004), Ireland (2002), Malta, Poland, Romania, Russia, Serbia/Montenegro, Slovakia, Slovenia, Sweden (except for 2005), Turkey (except for 2005), United Kingdom.

Data discrepancies:

- Georgia listed in its 2005 CBM 10 (2004) and 7 (2001) cases of brucellosis and did not declare any data for the other years. In the CISID 151 (2004), 104 (2003), 156 (2002), 190 (2001) and 70 (2000) cases were registered.
- Norway declared in its 2005 CBM 2 (2002), 1 (2001) and 0 (2000) cases. In its earlier CBMs of 2004, 2003 and 2002 it declared 3 (2002), 2 (2001) and 1 (2000) cases, which is in accordance with the numbers in the CISID statistic.
- Poland did not specify the year for which the cases were reported and reported only cases in the armed forces.
- Spain declared in its CBM of 2005 12 (2004), 24 (2003), 28 (2002), 25 (2001) and 30 (2000) cases of brucellosis. The CISID statistic lists 632 (2004), 642 (2003), 893 (2002), 924 (2001) and 1146 (2000) cases.
- Turkey declared in its 2005 CBM 13,870 (2003) and 17,765 (2002) cases. This differs from the 14,572 (2003) and 17,584 (2002) cases in the CISID.

3.2.4. Crimean-Congo hemorrhagic fever (CCHF)

Sources: CISID, Eurosurveillance weekly, WHO Disease Outbreak News.

The following States Parties provided information on CCHF: Australia (2005), **Bulgaria** (2005, 2004), Iran (2002), Japan (2005, 2004), Libya (2005), **Norway** (2005), South Africa (2005, 2004, 2003, 2002).

The following States Parties provided information on viral hemorrhagic fevers in general: Australia (2004, 2002), **Bulgaria** (2001), **Germany** (2002), **Netherlands** (2005, 2004, 2002, 2001), Republic of Korea (2001), **Sweden** (2005, 2001), **Switzerland** (2005, 2004, 2003, 2002, 2001).

The following States Parties had registered cases of CCHF in open sources but did not provide a Form B (i) or had not listed CCHF, although they have submitted a CBM: Bulgaria (2003, 2002), Serbia/Montenegro, Turkey.

Data discrepancies:

- For Serbia, the CISID registers 1 case of CCHF in 2001, but in the WHO Disease Outbreak News 18 cases of CCHF in 2001 are mentioned for the Kosovo alone.

3.2.5. Plague

Sources: CISID, WHO Weekly epidemiological record.¹⁵

The following States Parties provided information on plague: Australia (2005, 2004, 2003, 2002, 2001), **Brazil** (2005, 2004, 2002, 2001), Canada (2005, 2004, 2003, 2002, 2001), **Germany** (2005, 2004, 2003, 2002, 2001), **Ireland** (2005), Japan (2005), Libya (2005), **Lithuania** (2005), **Norway** (2005, 2004, 2003, 2002), Republic of Korea (2005), South Africa (2005, 2004, 2003, 2002), **Sweden** (2005, 2001), **Switzerland** (2005, 2004, 2003, 2002, 2001), **USA** (2005, 2004, 2003, 2002, 2001).

¹⁵ WHO, Weekly epidemiological record, 13 August 2004, vol. 79, 33 ,pp 301-308.

The following States Parties had registered cases of plague in open sources but did not provide a Form B (i) or had not listed plague, although they have submitted a CBM: Belarus, China, Peru, Austria, Estonia, Serbia.

The following States Parties have not submitted a CBM but cases of plague were mentioned in open sources: Algeria, Congo, Kenya, Botswana, Mozambique, Uganda, Zimbabwe, Bolivia, Ecuador, India, Indonesia, Laos, Mongolia.

3.2.6. Q fever

Source: CISID.

The following States Parties provided information on Q fever: Australia (2005, 2004, 2003, 2002, 2001), **Bulgaria** (2005, 2004, 2003, 2002, 2001), **Croatia** (2004), **Germany** (2005, 2004, 2003, 2002, 2001), **Hungary** (2005, 2004), Japan (2005, 2004, 2003), **Netherlands** (2005, 2004, 2003, 2002, 2001), **Norway** (2004, 2003, 2002), **Slovakia** (2005, 2004, 2003, 2002, 2001), **Sweden** (2005).

The following States Parties had registered cases of Q fever in open sources but did not provide a Form B (i) or had not listed Q fever, although they have submitted a CBM: Belgium, Czech Republic, Finland, France, Georgia, Greece, Hungary (except for 2003), Ireland, Poland, Romania, Slovenia, Spain, United Kingdom.

Data discrepancies:

- Croatia declared in its 2004 CBM 41 cases of Q fever for the year 2000. The CISID lists 26 cases in the year 2000.

3.2.7. Smallpox

Source: WHO.

The following States Parties provided information on smallpox: **Argentina** (2005, 2004, 2003, 2002), **Germany** (2005, 2004, 2003, 2002, 2001), **Ireland** (2005), **Japan** (2005, 2004), **Poland** (2001), **Republic of Korea** (2005).

As a result of a global campaign the worldwide eradication of smallpox was certified by the World Health Assembly in 1980. Since the eradication of smallpox, universal immunization has been terminated. Official stocks of smallpox remain in Russia and the USA. There is also the possibility that secret stocks of smallpox remain in other places. For these reasons, the danger of smallpox being used as a biological weapon can not be excluded, and smallpox remains on the list of agents of concern.

Neither in the CBMs nor in the WHO databases are cases of smallpox registered, with one exception. In 2001, Poland declared six cases of smallpox in the Polish armed forces in 2000. This declaration is most likely a mistake due to the fact that Poland did not use disease names but made use of the wrong ICD-10 disease code in their Form B declaration. Nevertheless, inquiries should be made regarding this declaration.

3.2.8. Tularemia

Sources: CISID, WHO Disease Outbreak News.

The following States Parties provided information on tularemia: Argentina (2005, 2004, 2003), Australia (only for animals, 2005, 2004, 2003, 2002, 2001), **Bulgaria** (2005, 2004, 2003, 2002, 2001), Canada (2005), **Croatia** (2004), **Estonia** (2005, 2004, 2003, 2001), **Finland** (2005, 2004, 2003, 2002, 2001), **Germany** (2005, 2004, 2003, 2002, 2001), **Hungary** (2005, 2004), **Italy** (2005, 2004, 2003, 2002), Japan (2005, 2004), **Norway** (2005, 2004, 2003, 2002), **Slovakia** (2005, 2004, 2003, 2002, 2001), **Spain** (2005, 2004, 2003, 2002), **Sweden** (2005), **Switzerland** (2005, 2004, 2003, 2002).

The following States Parties had registered cases of tularemia in open sources but did not provide a Form B (i) or had not listed tularemia, although they have submitted a CBM: Armenia, Austria, Croatia (except for 2004), France, Georgia, Hungary (only for 2003, 2002 and 2001), Poland, Serbia/Montenegro, Ukraine.

Data discrepancies:

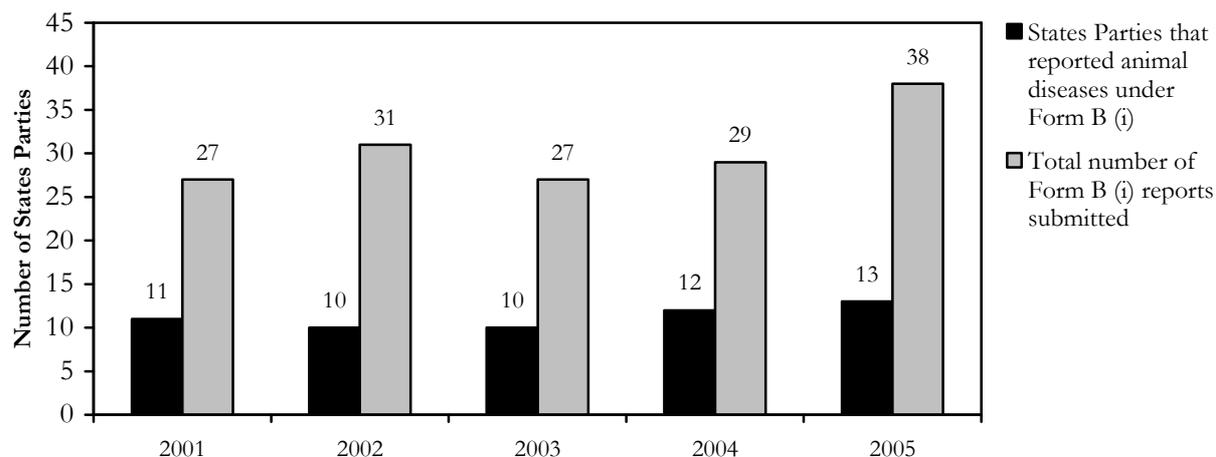
- Finland reported 926 cases for the year 2000 in its CBMs from 2005, 2004 and 2003. In its 2002 CBM for the same year 928 cases were declared. In its 2001 CBM 917 cases were declared for the year 2000. In the CISID 917 cases of tularemia are registered for the year 2000.
- Finland declared in its 2005 CBM 106 cases of tularemia for the year 2004. The CISID lists 151 cases.
- Sweden declared in its 2005 CBM 698 cases for 2003, but 798 are listed in the CISID.
- Norway declared in its 2005 and 2004 18 cases for 2003 and in all its CBMs 3 cases for 2001. The CISID reports 20 and 6 cases, respectively.
- Spain reported in its 2005 CBM 2 cases for 2004 and 1 case each for 2000 and 2001. The CISID lists 18 (2004), 1 (2003), 0 (2002), 2 (2001) and 0 (2000) cases.

3.3. Analysing CBM Form B (i): Animal diseases

Many States Parties submit information under CBM Form B (i) only on human diseases, probably due to the fact that it is not further specified in the CBMs what diseases should be covered.

The following States Parties provided information on animal diseases: Argentina (2005, 2004, 2003, 2002), Australia (2005, 2004, 2003, 2002, 2001), Croatia (2004), Cuba (2005, 2004, 2003, 2002, 2001), Estonia (2004, 2003, 2001), Germany (2005, 2004, 2003, 2002, 2001), Japan (2005, 2004, 2003, 2002, 2001), Libya (2005), Lithuania (2005, 2004, 2003, 2002, 2001), Morocco (2005), Netherlands (2005, 2004, 2003, 2002, 2001), New Zealand (2005, 2004, 2003, 2002, 2001), Romania (2004, 2002, 2001), Switzerland (2005, 2004, 2003, 2002, 2001), United Kingdom (2005, 2004, 2003, 2002).

Figure 5: Number of States Parties that included information on outbreaks of animal diseases in their CBMs



3.3.1. Foot and Mouth Disease (FMD)

The following States Parties had registered cases of FMD in the OIE database for the years 2000 to 2004, but did not provide a Form B (i) or had not listed FMD, although they have submitted a CBM: Brazil, France, Georgia, Greece, Iran, Republic of Korea, Libya, Peru, Russia, South Africa, Turkey and United Kingdom. Of these states only Libya and the United Kingdom submitted data on animal diseases at all.

The following States Parties have not submitted a CBM but declared FMD outbreaks to the OIE: Afghanistan, Azerbaijan, Bahrain, Bangladesh, Benin, Bhutan, Bolivia, Burkina Faso, Cambodia, Colombia, Congo, Ecuador, Ethiopia, Ghana, India, Iraq, Kenya, Kuwait, Laos, Lebanon, Malaysia, Mali, Mongolia, Niger, Nigeria, Oman, Pakistan, Paraguay, Philippines, Rwanda, Saudi Arabia, Senegal, Sri Lanka, Swaziland, Thailand, Togo, Uganda, Uruguay, Venezuela, Vietnam, Yemen, Zimbabwe.

3.3.2. Rinderpest

Rinderpest did not appear in any country beside Kenya (2001) and Pakistan (2000). Except for Argentina, Germany and Switzerland that reported no cases, no State Party provided any background information on rinderpest.

3.4. Analysing CBM Form B (ii)

In CBM Form B (ii) “outbreaks of infectious diseases and similar occurrences that seem to deviate from the normal pattern” should be reported. Between 1987 and 2005 20 states submitted 53 Form B (ii) declarations with 92 reported outbreaks. Some states reported one enduring outbreak of several years only once or the same outbreak year after year. The number of states that declared a Form B (ii) between 1987 and 2005 is shown in Figure 6.

Figure 7 shows that the majority of reports is related to human disease outbreaks, followed by disease outbreaks in livestock. Outbreaks of plant diseases were reported four times in the CBMs, three times by Cuba and once by Iran.

Figure 6: Number of states that declared a Form B (ii) in the years 1987 to 2005

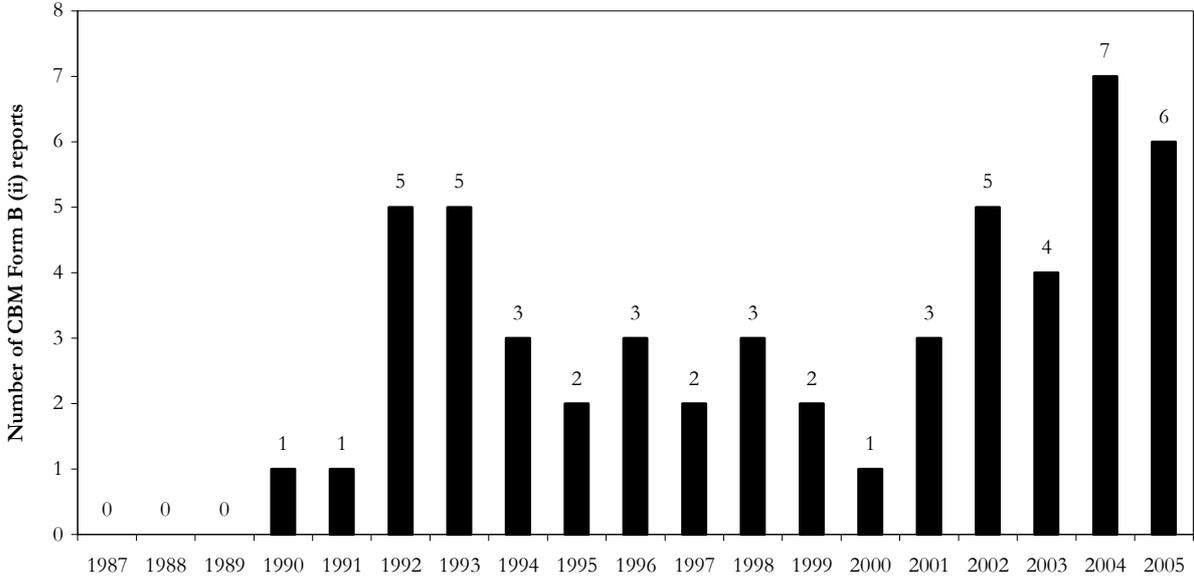
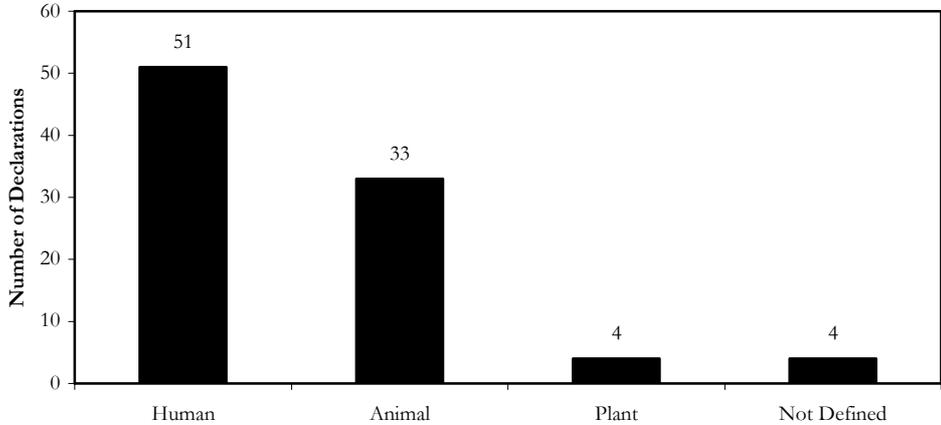
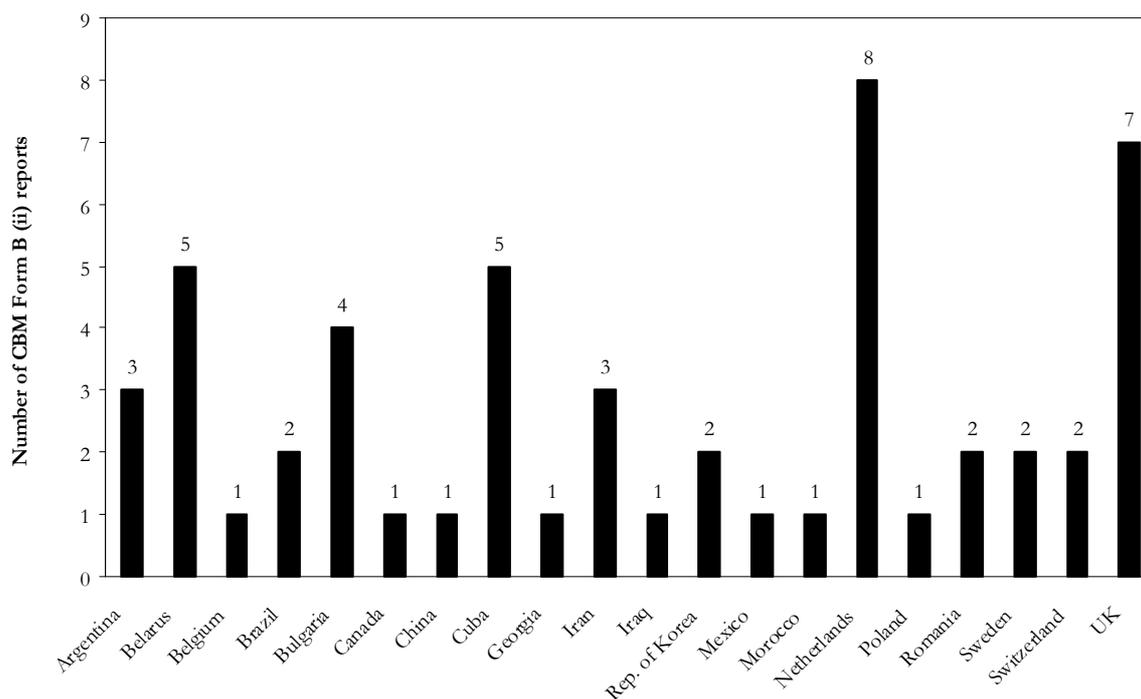


Figure 7: Types of outbreaks reported in CBM Form B (ii) in the years 1987 to 2005



Out of a total of 93 countries that have submitted a CBM between 1987 and 2005, 20 submitted a Form B (ii). As shown in Figure 8, the distribution of these forms among countries is unequal. This inequality is mostly due to the fact that some states reported one outbreak event several times. Annex I shows the distribution of CBM Form B (ii) reports according to disease.

Figure 8: Number of CBM Form B (ii) reports per country in the years 1987 to 2005



Of the 92 reported unusual outbreaks, one was declared as an act of bioweapon usage. In its 1997 CBM declaration Cuba accused the USA of spreading *Thrips palmi*, a crop destroying insect, on Cuban territory. This incident was discussed during the first ever consultative meeting as provided for under Article V of the BWC.¹⁶

Using the criteria described in section 2.2., open sources such as the WHO Disease Outbreak News and ProMED-mail were searched for unusual outbreaks of disease. Many events were identified that could have been reported, either because the pathogen occurred for the first time in a particular region, the outbreak was very wide spread or the course of the disease was very severe. The following list provides examples of what could have been reported under CBM Form B (ii). This list is not intended to be complete.

- **Brucellosis:** In 2004, China faced a brucellosis epidemic, with close to as many cases in the first half of 2004 as the total number of reported cases in 2003.¹⁷
- **Rift Valley fever:** In 2000, the first cases of Rift Valley fever ever reported outside traditionally affected African countries occurred in Saudi Arabia.¹⁸
- **Ebola:** In 2000, the first cases of Ebola haemorrhagic fever in Uganda were confirmed.¹⁹
- **Dengue:** In 2002, a large outbreak in the City of Rio de Janeiro in Brazil occurred. Until then, it was the largest outbreak in the state's history.²⁰

¹⁶ For further information on this allegation see e. g. Zilinskas, R. A.: Cuban Allegations of Biological Warfare by the United States: Assessing the Evidence, *Critical Reviews in Microbiology* Vol. 25 No. 3 (1999), p. 173-227.

¹⁷ ProMED-mail: Brucellosis: Archive Number 20041222.3371, published 22 December 2004.

¹⁸ WHO: Rift Valley fever in Saudi Arabia – Update / Acute haemorrhagic fever syndrome in Yemen, Press release issued on 29 September 2000.

¹⁹ WHO: Ebola haemorrhagic fever in Uganda, Press release issued on 16 October 2000.

²⁰ WHO: 2002 - Dengue/dengue haemorrhagic fever in Brazil, *WHO Disease Outbreak News*, 21 March 2002.

- **West Nile virus:** In 2002, the first confirmed human case of this disease was reported from Canada.²¹

One event that should have been reported because of its deliberate nature was the anthrax letter attack in the USA in 2001. Between 4 October and 20 November 2001, 22 cases of anthrax were identified; five people died.²² The USA did not declare this event under CBM Form B (ii).

4. Comments, conclusions and recommendations

Between 2001 and 2005 only about one third of all BWC Member States submitted a CBM and even fewer included information about disease outbreaks in their territory. Data that were declared under CBM Form B vary greatly in quality and quantity. Under CBM Form B (i) some states declared the case number for one disease for one year, other states declared case numbers for a long list of diseases for several years. Under CBM Form B (ii) 92 unusual outbreaks were declared by 20 states between 1987 and 2005.

Identifying reliable open sources of disease outbreak data turned out to be very complicated. For animal diseases the OIE World Animal Health Information Database provides comprehensive global data. The most detailed statistical database found for human diseases was the Centralized Information System for Infectious Diseases (CISID) of the WHO Regional Office for Europe, which covers only European countries. It seems that no comprehensive and global open source database with human disease data exists. If CBMs were handed in by all BWC States Parties on a regular basis, CBM Form B (i) might eventually create such a database. However, arguably a public health body rather than an arms control institution would be a better framework in which collection of data on human diseases should occur. Making the information submitted in CBM Form B (i) available to the WHO would be advantageous and could promote the establishment of such a comprehensive global database. Any such database, once it is established, would render CBM Form B (i) obsolete.

Comparison of data submitted under CBM Form B (i) with open source information led to the conclusion that disease data are often not declared and if they are, they are mostly inaccurate and incomplete. Comparing data submitted under CBM Form B (ii) with open source information posed problems because an unusual outbreak as defined in the CBMs is not necessarily an outbreak relevant to the BWC. The problem lies in the fact that although many outbreaks are unusual, their sources are generally easily explainable. In these cases it is up to the state whether to report this outbreak under CBM Form B (ii) or not. Although a straightforward explanation for an outbreak does not preclude a bioweapon related event, vice versa, an outbreak that is difficult to explain does not make bioweapons use a more likely reason. Public health officials and the international community should hesitate to jump to conclusions. Furthermore, collecting information about disease outbreaks as an indicator for an accidental release from a facility engaged in illicit activities is somewhat futile because it is not likely that the State Party involved will declare such an event.

Although one possibility of recognizing violations of the BWC is the occurrence of unusual disease outbreaks, it is open to question whether CBM Forms B (i) and B (ii) in their current form are suited for this purpose. As long as no comprehensive global disease database exists, CBM Form B (i) should be kept, because in certain cases it provides information not available

²¹ WHO: 2002 - West Nile virus in Canada, WHO Disease Outbreak News, 12 September 2002.

²² Jernigan, D. B., Raghunathan, P. L., Bell, B. P., Brechner, R., Bresnitz, E. A., Butler, J. C., et al.: Investigation of bioterrorism-related anthrax, United States, 2001: epidemiologic findings, Emerging Infectious Diseases, 8 October 2002, available at <http://www.cdc.gov/ncidod/EID/vol8no10/02-0353.htm>.

elsewhere. However, a stricter definition what kind of information has to be declared is indispensable.

To this end, a first recommendation for CBM Form B (i) is to remove the possibility of ticking “nothing new to declare” or “nothing to declare” in Form 0 because there is always something to declare, be it the presence or absence of a disease (which is an important information) or case numbers, which will virtually never be the same in different years. Under CBM Form B (i) a new declaration should be required each year.

Secondly, the potential for ambiguity in the declaration needs to be eliminated. For example, currently it is not clear if diseases which are not listed did not occur, information on these diseases is not collected, or if the information was simply not reported. It is recommended therefore, that CBM Form B (i) specify precisely for which human, animal and plant diseases information must be provided. This list must be precise but not exclusive; more diseases can be declared. For each disease the information provided must be unmistakably clear. If no case numbers are provided, an indication needs to be included, why this is the case. A clearer form would make declarations more standardized, facilitating use and analysis of data. To further facilitate analysis by avoiding language complications, the International Statistical Classification of Diseases and Related Health Problems (ICD) codes for human diseases might be useful in addition to the disease names. Annex I shows how an amended CBM Form B (i) could look like.

It is the opinion of the author that the collection of human disease outbreak data although relevant towards transparency for an arms control regime should happen in a public health setting such as the WHO. A possible framework for identifying and dealing with unusual human disease outbreaks are the International Health Regulations (IHR) developed by the WHO.²³ Under these regulations all events of “international concern” have to be reported immediately to the WHO which provides the necessary international technical support for a quick public health response. For animal and plant diseases the surveillance mechanisms of the OIE and FAO should be used.

However, as a contribution to transparency the author recommends that countries submit – under a new CBM Form B (ii) – declarations on events of biosecurity concern, like accidents in biodefence facilities and incidents with weaponized biological material even if nobody was infected. For example, Japan could provide information on the release of microorganisms by the Aum Shinrikyo cult in 1995. The United States could declare the anthrax letter attacks in 2001. Such a narrowly focussed CBM Form B (ii) declaration would provide a global picture of events of biosecurity concern.

A similar data collection system is under construction at the UN Office for Disarmament Affairs. Mandated by the UN Global Counter-Terrorism Strategy, a single comprehensive global biological incidents database is going to be established. This database will include detailed information on incidents in which a biological agent harms or threatens to harm humans, livestock, or agricultural assets. It will also include information on all related reported hoaxes.²⁴ Any such database would duplicate a revised CBM Form B (ii).

²³ Information about the IHR and its legal framework are available at: <http://www.who.int/csr/ihr/en/>. Access date: 26th October 2007.

²⁴ UN Action to Counter Terrorism. Factsheet. Available at: http://www.un.org/terrorism/pdfs/CT_factsheet_may2007x.pdf.

Annex I – Unusual outbreaks of disease reported under CBM Form B (ii) 1987 to 2005

Unusual outbreaks of disease reported under CBM Form B (ii) 1987 to 2005

This table does not take into account that identical outbreak events were reported several times or that enduring outbreak events were reported in more than one of the annual CBMs. It only sorts the reports by disease.

Disease	Organism affected	Number of reports
Anthrax	Human	1
	Animal	4
	Not Defined	1
Avian influenza	Animal	2
Blue eared pig disease	Animal	2
Bluetongue	Animal	2
Botulism	Human	2
	Animal	4
	Not Defined	1
Brucellosis	Not Defined	1
BSE	Animal	1
Cholera	Human	11
Crimean Congo haemorrhagic fever	Human	4
Date-palm disease	Plant	1
Diaphorina citri	Plant	1
Enteroviral meningitis	Human	4
Equine viral arteritis	Animal	1
Foot and mouth disease	Animal	5
Haemorrhagic fever with renal syndrome	Human	1
Hog Cholera	Animal	2
Legionellosis	Human	2
Lymphocytic choriomeningitis virus	Human	1
Maedi Visna Virus	Animal	1
Measles	Human	3
Mediterranean tick fever	Human	1
Myiasis	Human	1
Nosocomial infections	Human	1
Ornithosis	Not Defined	1
Paralysis (poultry)	Animal	1
Poliomyelitis	Human	3
Q fever	Human	2
Rabbit Haemorrhagic Disease	Human	1
	Animal	3
Rabies	Human	2
	Animal	1
Rubella	Human	1
Salmonellosis	Human	1
	Animal	1
Scrapie	Animal	1
Severe Acute Respiratory Syndrome (SARS)	Human	2
Steneotarsonemus spinki	Plant	1
Swine vesicular disease	Animal	1
Thrips palmi	Plant	1
Tularemia	Human	1
Typhoid fever	Human	4
West Nile Virus	Human	2
	Animal	1
Total:		92

Annex II– Proposal for a redesigned CBM Form B (i)

CBM Form B (i) for human diseases

In the following table, case numbers – including “0 cases” if applicable – of the respective disease are to be declared for the previous five years. If no information on the respective disease is available, please indicate this by “n.a.”.

Disease	ICD	Cases in 2003	Cases in 2004	Cases in 2005	Cases in 2006	Cases in 2007
Anthrax (<i>Bacillus anthracis</i>)	A22					
Botulism (<i>Clostridium botulinum</i>)	A05.1					
Plague (<i>Yersinia pestis</i>)	A20					
Smallpox (variola major)	B03					
Tularemia (<i>Francisella tularensis</i>)	A21					
Viral hemorrhagic fevers:						
Brucellosis (<i>Brucella</i> species)	A23					
Epsilon toxin of <i>Clostridium perfringens</i> poisoning	A05.2/ B96.7					
Food safety threats (e.g., <i>Salmonella</i> species, <i>Escherichia coli</i> O157:H7, <i>Shigella</i>):						
Glanders (<i>Burkholderia mallei</i>)	A24					
Melioidosis (<i>Burkholderia pseudomallei</i>)	A24.4					
Psittacosis (<i>Chlamydia psittaci</i>)	A70					
Q fever (<i>Coxiella burnetii</i>)	A78					
Ricin poisoning (<i>Ricinus communis</i>)	T62.2					
Staphylococcal enterotoxin B poisoning	A05.0					
Typhus fever (<i>Rickettsia prowazekii</i>)	A75.0					

CBM Form B (i) for animal diseases

In the following table, case numbers – including “0 cases” if applicable – of the respective disease are to be declared for the previous five years. If no information on the respective disease is available, please indicate this by “n.a.”.

Disease	Cases in 2003	Cases in 2004	Cases in 2005	Cases in 2006	Cases in 2007
Anthrax (<i>Bacillus anthracis</i>)					
Brucellosis (<i>Brucella</i> species)					
Crimean Congo haemorrhagic fever					
Q fever (<i>Coxiella burnetii</i>)					
Rabies					
West Nile fever					
Rift Valley fever					
Tularemia (<i>Francisella tularensis</i>)					
Anthrax (<i>Bacillus anthracis</i>)					
Foot and Mouth Disease virus					
Rinderpest virus					
Vesicular stomatitis virus					
Peste des petits ruminants virus					
Bluetongue virus					
African swine fever virus					
Teschen disease virus					
Highly pathogenic Avian influenza virus					
Newcastle disease virus					
African horse sickness virus					
Other reportable infectious animal diseases:					

CBM Form B (i) for plant diseases

In the following table, the area infected – including “0 sq.km” if applicable – by the respective disease is to be declared for the previous five years. If no information on the respective disease is available, please indicate this by “n.a.”.

Disease	Infected area in sq. km in 2003	Infected area in sq. km in 2004	Infected area in sq. km in 2005	Infected area in sq. km in 2006	Infected area in sq. km in 2007
<i>Tilletia indica</i>					
Sugar cane Fiji disease virus					
<i>Xanthomonas albilineans</i>					
<i>Colletotrichum coffeanum</i> var. <i>Virulans</i>					
<i>Peronospora tabacina</i>					
<i>Erwinia amylovora</i>					
<i>Ralstonia solanacearum</i>					
<i>Dothistroma pini</i>					
Other reportable plant diseases:					