Confidence Building Measures

Canada

2013 Annual Report of
Confidence Building Measures
Biological and Toxin Weapons Convention

Government of Canada Gouvernement du Canada

Canada

Revised forms for the submission of the Confidence-Building Measures

At the Third Review Conference it was agreed that all States Parties present the following declaration, later amended by the Seventh Review Conference:

Declaration form on Nothing to Declare or Nothing New to Declare for use in the information exchange

Measure	Nothing to Declare	Nothing New to Declare	Last year of declaration if nothing new to declare
A, part 1 (i)		X	Submission repeated verbatim from 2011
A, part 1 (ii)	X		
A, part 2 (i)		X	Submission repeated verbatim from 2011
A, part 2 (ii)			
A, part 2 (iii)			
B			
C			
E			
F		X	Submission repeated verbatim from 2011
G			

(Please mark the appropriate box(es) for each measure with a tick, and fill in the year of last declaration in the last column where applicable.)

Date: 15 April 2013

State Party to the Convention: CANADA

Date of ratification/accession to the Convention: 18 September 1972

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Active promotion of contacts

The Third Review Conference agreed that States parties continue to implement the following:

> "Active promotion of contacts between scientists, other experts and facilities engaged in biological research directly related to the Convention, including exchanges and visits for joint research on a mutually agreed basis."

In order to actively promote professional contacts between scientists, joint research projects and other activities aimed at preventing or reducing the occurrence of ambiguities, doubts and suspicions and at improving international cooperation in the field of peaceful bacteriological (biological) activities, the Seventh Review Conference encouraged States parties to share forward looking information, to the extent possible,

> - on planned international conferences, seminars, symposia and similar events dealing with biological research directly related to the Convention, and
>
> - on other opportunities for exchange of scientists, joint research or other measures to promote contacts between scientists engaged in biological research directly related to the Convention, including through the Implementation Support Unit (ISU) within the United Nations Office for Disarmament Affairs.

CONFIDENCE BUILDING MEASURE A

Part 1: Exchange of data on research centres and laboratories

At the Third Review Conference it was agreed that States Parties continue to implement the following:

> "Exchange of data, including name, location, scope and general description of activities, on research centres and laboratories that meet very high national or international safety standards established for handling, for permitted purposes, biological materials that pose a high individual and community risk or specialize in permitted biological activities directly related to the Convention."

Modalities

The Third Review Conference agreed on the following, later amended by the Seventh Review Conference:

> Data should be provided by States Parties on each facility, within their territory or under their jurisdiction or control anywhere, which has any maximum containment laboratories meeting those criteria for such maximum containment laboratories as specified in the latest edition of the WHO Laboratory Biosafety Manual and/or OIE Terrestrial Manual or other equivalent guidelines adopted by relevant international organisations, such as those designated as biosafety level 4 (BL4, BSL4 or P4) or equivalent standards.
>
> States Parties that do not possess a facility meeting criteria for such maximum containment should continue to Form A, part 1 (ii).

CONFIDENCE BUILDING MEASURE A, Part 1 (i)

Exchange of Data on Research Centres and Laboratories - #1

1. Name(s) of the research centre and/or laboratory

National Microbiology Laboratory
Public Health Agency of Canada
Canadian Science Centre for Human and Animal Health

2. Responsible public or private organization or company

Public Health Agency of Canada

3. Location and postal address

Public Health Agency of Canada
1015 Arlington Avenue
Winnipeg, Manitoba
R3E 3R2

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence

Canadian Government - Public Health Agency of Canada

5. Number of maximum containment units within the research centre and/or laboratory, with an indication of their respective size (m^2)

Level 4 - 1 unit (185 m^2)

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate.

This laboratory is a national centre of expertise that provides diagnostic, reference and research services on human diseases mainly from biosafety level 3 and 4 micro-organisms.

Micro-organisms used and/or stored in this facility: Bacteria and viruses.
Toxins: SEB, Clostridium botulinum, Ricin.

CONFIDENCE BUILDING MEASURE A, Part 1 (i)

Exchange of Data on Research Centres and Laboratories - #1

1. Name(s) of the research centre and/or laboratory

National Centre for Foreign Animal Disease

2. Responsible public or private organization or company

Canadian Food Inspection Agency, Science Branch

3. Location and postal address

1015 Arlington Street
Winnipeg, Manitoba
R3E 3M4

4. Source(s) of financing of the reported activity, including indication if the activity is wholly or partly financed by the Ministry of Defence

Canadian Government - Canadian Food Inspection Agency

5. Number of maximum containment units within the research centre and/or laboratory, with an indication of their respective size (m^2)

Level 4: 2 units ($65m^2$) and ($35m^2$)

6. Scope and general description of activities, including type(s) of micro-organisms and/or toxins as appropriate.

The National Centre for Foreign Animal Disease within the Canadian Science Centre for Human and Animal Health conducts diagnostic testing and research on livestock and poultry diseases that are non-indigenous to Canada. The centre became operational in April 1998.

CONFIDENCE BUILDING MEASURE A, Part 1 (ii)

If no BSL4 facility is declared in Form A, part 1 (i), indicate the highest biosafety level implemented in facilities handling biological agents on a State Party's territory:

NOT APPLICABLE: Canada possesses two BSL4 laboratories

Biosafety level 3	yes / no
Biosafety level 2 (if applicable)	yes / no

Any additional relevant information as appropriate:

_____

_____

_____

_____

CONFIDENCE BUILDING MEASURE A, Part 2

Exchange of information on national biological defence research and development programmes

At the Third Review Conference it was agreed that States Parties are to implement the following:

In the interest of increasing the transparency of national research and development programmes on biological defence, the States Parties will declare whether or not they conduct such programmes. States Parties agreed to provide, annually, detailed information on their biological defence research and development programmes including summaries of the objectives and costs of effort performed by contractors and in other facilities. If no biological defence research and development programme is being conducted, a null report will be provided.

States Parties will make declarations in accordance with the attached forms, which require the following information:

(1) The objective and summary of the research and development activities under way indicating whether work is conducted in the following areas: prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxinology, physical protection, decontamination and other related research;

(2) Whether contractor or other non-defence facilities are utilized and the total funding provided to that portion of the programme;

(3) The organizational structure of the programme and its reporting relationships; and

(4) The following information concerning the defence and other governmental facilities in which the biological defence research and development programme is concentrated;

(a) location;

(b) the floor areas (sqM) of the facilities including that dedicated to each of BL2, BL3 and BL4 level laboratories;

(c) the total number of staff employed, including those contracted full time for more than six months;

(d) numbers of staff reported in (c) by the following categories: civilian, military, scientists, technicians, engineers, support and administrative staff;

(e) a list of the scientific disciplines of the scientific/engineering staff;

(f) the source and funding levels in the following three areas: research, development, and test and evaluation; and

(g) the policy regarding publication and a list of publicly-available papers and reports.

CONFIDENCE BUILDING MEASURE A, Part 2 (i)

National Biological Defence Research and Development Program Declaration

1. Is there a national program to conduct biological defence research and development within the territory of the State Party, under its jurisdiction and control anywhere? Activities of such a program would include prophylaxis, studies on pathogenicity and virulence, diagnostic techniques, aerobiology, detection, treatment, toxicology, physical protection, decontamination and other related research.

For CANADA, YES

CONFIDENCE BUILDING MEASURE A, Part 2 (ii)

National Biological Defence Research and Development Program

Defence Research & Development Canada (DRDC):

II. Description

1. The objective of the Canadian Biological Defence Program at Defence R&D Canada is to ensure that the Canadian Forces are provided with an adequate defence against biological warfare agents. No offensive studies of any kind are permitted by the Government of Canada. The Program is wholly funded by the Canadian Department of National Defence and Public Safety Canada on behalf of the Government. The principal research and development areas are the following:
   a. assessment of the hazards that may be faced by the Canadian Forces from biological agents and toxins;
   b. detection of biological agents and toxins using immunological, biochemical and physical detection methods;
   c. medical countermeasures against the infections or intoxications from biological agents and toxins;
   d. decontamination of biological agents and toxins;
   e. personal protection from biological agents and toxins;
   f. studies on the mode of action and toxicity of toxins and the mode of action and infectivity of biological agents; and
   g. provision of biological agent training for the Department of National Defence and the First Responder community.

2. In Canada, the biological and chemical defence programs are integrated; exact separation of the costs of the two programs would be very difficult without a detailed analysis of every purchase. It is estimated that in 2012, the amount spent on the Canadian biological defence program was $6,933,150 including salaries. The source of this funding was the Government of Canada.

3. Yes.

4. See answer to question 2. About $2,426,800 was spent on contracts with industry and universities.

5. Contractors are used to support all of the various aspects of the program listed in paragraph 1 above.

6. In Canada, the research and development program in biological defence is the responsibility of the Defence R&D Canada (DRDC). Research and some development are carried out primarily at the Defence R&D Canada – Suffield (DRDC Suffield) and through contractors. The bulk of the development program is carried out from DRDC Corporate headquarters. A minor effort in the stand-off detection of biological agents is

carried out at DRDC Valcartier. Organizational chart of those parts of DRDC Suffield and DRDC Valcartier responsible for biological defence are included in Form A, part 2 (iii). Only those organisational elements working on Biological Defence are included.

CONFIDENCE BUILDING MEASURE A, Part 2 (ii)

National Biological Defence Research and Development Program

CBRNE Research and Technology Institute (CRTI):

1. The **Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) Research and Technology Initiative (CRTI)** is mandated to strengthen Canada's ability to prevent, prepare for, respond to and recover from CBRNE threats through investment in science and technology.

2. CRTI is an ongoing program with Government of Canada funding of $350,000,000 between 2002 and 2012. Funds are for the CBRNE projects and it is not possible to know exactly the percentage specifically allocated to biological research alone as many of the projects respond to more than one of the CBRNE hazards. A portion of the funds are for overhead and overall management of the program.

3. Yes, aspects of this programme are conducted under contract with industry, academic institutions, or in other non-defence facilities.

4. Funds distributed to industry, government and academia can be seen in the following chart:

CRTI $ BY SECTOR	CRTI $M NINE ROUNDS	%
Industry	**$107M**	**42%**
Government	**$108M**	**42%**
Academia	**$41M**	**16%**
TOTAL	**$256M**	**100%**

5. Summarize the objectives and research areas of the programme performed by contractors and in other facilities with the funds identified under paragraph 4:

Since 2002, The CRTI Program has conducted 9 Calls for Proposals through which it has implemented 166 research projects representing an investment of $256M. The project partners have leveraged this investment by $256M of in-kind contribution, a one-to-one ratio. The 166 projects are summarized in *Annex 1*.

6. Provide a diagram of the organizational structure of the programme and the reporting relationships (include individual facilities participating in the programme).

The participating departments and agencies are:

- Department of National Defence/Defence R&D Canada
- Department of Public Safety
- Health Canada
- Public Health Agency of Canada
- Environment Canada
- Agriculture and Agri-Food Canada
- Canadian Food Inspection Agency
- Department of Fisheries and Oceans
- National Research Council
- Natural Resources Canada
- Royal Canadian Mounted Police
- Canadian Security Intelligence Service
- Atomic Energy of Canada Ltd.
- Industry Canada
- Canada Border Services Agency
- Canadian Nuclear Safety Commission
- Transport Canada
- Public Works and Government Services Canada
- Privy Council Office, and
- Treasury Board Secretariat.

7. Provide a declaration in accordance with Form A, part 2 (iii) for each facility, both governmental and non-governmental, which has a substantial proportion of its resources devoted to the national biological defence research and development programme, within the territory of the reporting State, or under its jurisdiction or control anywhere.

All projects under the CRTI are carried out in existing facilities that are covered in other sections of this report.

8. The latest CRTI Call for Proposals resulted in 12 new projects being approved for implementation in 2011. Those projects related, either directly or tangentially, to the BTWC have been added to Annex 1, where they can be identified by the prefix "CRTI 09-xxxxxx", where "xxxxxx" is the project number. Of the CRTI projects listed in annex 1, investment in biological related projects is estimated to be $100M over ten years.

Annex 1: CRTI projects, 2002-2012

Acronyms:

AAFC: Agriculture and Agri-Food Canada
CFIA: Canadian Food Inspection Agency
CPRC: Canadian Police Research Centre
CSIS: Canadian Security Intelligence Service
DRDC: Defence Research & Development Canada
EC: Environment Canada
HC: Health Canada
NRC: National Research Council Canada
NRCan: Natural Resources Canada
PHAC: Public Health Agency of Canada
PSC: Public Safety Canada
PWGSC: Public Works and Government Services Canada
RCMP: Royal Canadian Mounted Police
RMC: Royal Military College

Charter #	Project Title	Project Portfolio	Lead Federal Department	Current CSS Investment	In-Kind Contribution
CRTI 01-0006RD	Induction of innate and specific immunity at muscosal surfaces	BIO	PHAC	$1,199,135	$1,264,500
CRTI 01-0011TA	Unified Interoperability Solution set to Support CONOPS Framework Development - Municipal-Provincial-Federal Collaboration to CBRN Response	BIO	DRDC Suffield	$791,561	$535,000
CRTI 01-0064RD	New technologies for surveillance of biowarfare agents and identification of engineered virulence genes	BIO	PHAC	$2,423,221	$1,487,402
CRTI 01-0087RD	Therapeutic antibody therapy for Ebola virus	BIO	PHAC	$2,612,181	$1,607,262
CRTI 01-0091RD	Development of monoclonal antibodies for treatment and detection of bio-terrorism agents	BIO	PHAC	$2,556,575	$3,562,640
CRTI 01-0154RD	Rapid DNA based diagnostic tests to identify five bacterial bio-threat agents	BIO	DRDC Suffield	$2,594,393	$1,751,702
CRTI 01-0196TA	Development of rapid detection field tests for Vet first responders to address agro-terrorism with animal pathogens	BIO	CFIA	$4,824,099	$4,700,000
CRTI 02-0021RD	Direct detection and identification of bioweapon nucleic acids based on cationic polymers	BIO	NRC	$1,000,001	$1,090,801
CRTI 02-0035RD	Canadian Network for Public Health Intelligence (CNPHI)	BIO	PHAC	$3,653,497	$4,208,572
CRTI 02-0041TA	Deployable CBRN monitoring network	BIO	HC	$1,135,028	$562,000
CRTI 02-0066RD	Risk analysis preparedness and management of bioterrorism of animal and zoonotic disease	BIO	CFIA	$1,321,069	$3,614,378
CRTI 02-0069RD	Molecular epidemiology of biothreat agents	BIO	PHAC	$1,654,769	$889,872
CRTI 02-0091TA	*Clostridium botulinum* genomic DNA microarray	BIO	HC	$391,723	$617,131
CRTI 03-0005RD	Sensor Technology for the Rapid Detection and Identification of Pathogens used as Bioweapons	BIO	NRC	$2,200,000	$4,524,943

CRTI 03-0021TD	Assay development and production team (ADAPT) for the development, validation, production, and distribution of assays for the identification of bioterrorism	BIO	PHAC	$2,000,000	$1,799,242
CRTI 03-0060RD	Protective Markers for Anthrax Serodiagnosis	BIO	DRDC Suffield	$982,073	$754,677
CRTI 04-0004RD	Canadian Animal Health Surveillance Network	BIO	CFIA	$3,715,775	$3,793,200
CRTI 04-0045RD	Development of Collections, Reference DNA Databases and Detection Systems to Counter Bioterrorism Against Agriculture and Forestry	BIO	AAFC	$2,000,000	$1,439,000
CRTI 04-0052RD	On Site Composting for Bio-Containment and Safe Disposal of Infectious Animal Carcasses and Manure in the Event of a Bio-Terrorist Attack	BIO	CFIA	$2,000,000	$3,438,641
CRTI 05-0078RD	Development of live replicating viruses as vaccines and therapies for Viral Hemorrhagic Fever viruses	BIO	PHAC	$2,010,000	$4,708,494
CRTI 05-0090TA	Adaptation of recently developed DNA microarrays to Nanochip microarray technology for detection of agro-terrorism agents	BIO	PHAC	$875,000	$642,000
CRTI 05-0106TA	Development of fieldable nucleic acid detection techniques for category 1 and 2 biological agents	BIO	PHAC	$780,000	$945,754
CRTI 06-0138RD	Development of Canadian diagnostic capability for Rift Valley Fever Virus (RVFV)	BIO	CFIA	$1,759,545	$1,863,980
CRTI 06-0187TD	Portable biological agent detection system	BIO	NRC	$2,500,000	$4,244,928
CRTI 06-0218RD	Pre-clinical development of a nasal adenovirus-based vaccine against Ebola virus.	BIO	PHAC	$652,979	$566,617
CRTI 06-0301TD	Development of Nasal Spray Formulated Antiviral Drug against Avian Influenza Virus	BIO	DRDC Suffield	$1,892,961	$1,060,000
CRTI 07-0109RD	Development and Application of Foresight and Future Visioning to Support Capability Based Planning for Animal Disease Emergency Management in Canada	BIO	CFIA	$1,917,000	$2,528,000
CRTI 07-0234RD	Mitigating dissemination of bioterrorism agents in Canadian food systems	BIO	AAFC	$1,569,865	$2,256,587
CRTI 07-0132TA	Portable Electronic Microarrays For Agro-bioterrorism: Detection and Typing of High Consequence Agents	BIO	CFIA	$1,375,675	$1,075,356
CRTI 08-0190RD	Data Fusion Solutions for Monitoring CBRNE Threats	BIO	NRC	$2,072,310	$3,659,663
CRTI 08-0203RD	Science and Technology Solutions to Mitigate Vulnerabilities in Canada's Food Supply	BIO	CFIA	$2,500,000	$1,341,335
CRTI 08-0112TA	Human monoclonal antibodies against ricin	BIO	DRDC Suffield	$1,200,000	$1,182,755
CRTI 08-0122TD	Validation of decontamination processes in the Agri-Food context	BIO	CFIA	$1,060,000	$874,482
CRTI 08-0181TD	Detection and Identification Assay Validation Program for Biothreat Agents	BIO	PHAC	$3,171,300	$1,711,932
CRTI 09-0403TA	Portable Electronic Microarrays for Agrobioterrorism: Detection and Typing of High Consequence Agents in Swine	BIO	CFIA	$1,321,570	$946,226

CRTI 09-0453TD	Final Development and production of clinically approved broad-spectrum anti viral treatment	BIO	PHAC	$1,380,659	$1,704,740
CRTI 09-0462RD	Next generation sequencing, direct detection and genotyping of fungi; bacteria and nematodes in the agri food system	BIO	AAFC	$1,999,000	$1,655,000
CRTI 09-0481TD	An Optical Imaging Device for a Rapid Assessment of Tissue Viability and Wound Healing	BIO	NRC	$1,810,328	$1,215,035
Biology Total	**38 Projects**			**$70,903,292**	**$75,823,847**

CRTI 01-0004TA	Development of MEMS-based Biological Agent Sensing Technology	CHEM	DRDC Suffield	$49,892	$25,000
CRTI 01-0019TA	Real-Time Confirmatory Bio Detection and Identification	CHEM	DRDC Suffield	$2,400,965	$3,073,146
CRTI 01-0029RD	Protecting the First Responder Against CB Threats (Developing New Standards for Broad Spectrum…)	CHEM	RMC	$2,952,604	$2,846,170
CRTI 01-0060TA	Rapid Triage Management Workbench	CHEM	NRC	$1,167,679	$1,145,626
CRTI 01-0100TA	CB Plus Chamber	CHEM	DRDC Ottawa	$1,649,722	$1,795,278
CRTI 01-0120RD	Development of Two Dimensional Molecular Imprinting Techniques (for use in Sensing and Screening Devices)	CHEM	NRC	$1,638,183	$1,647,328
CRTI 01-0131TA	HI-6 Nerve Agent Antidote System (International Collaboration on the Licensing of HI-6)	CHEM	DRDC Ottawa	$4,531,099	$15,000,000
CRTI 01-0161TA	CBRN Blast Protective Helmet	CHEM	RCMP	$1,160,000	$631,080
CRTI 02-0007TA	Medical countermeasures against ricin	CHEM	DRDC Suffield	$1,607,376	$1,086,600
CRTI 02-0043TA	Accelerated Consequences Management	CHEM	DRDC Suffield	$1,962,121	$1,839,704
CRTI 02-0053TA	Simulation based decision aid for the optimization of detection protection and decontamination systems with team structure and procedures	CHEM	DRDC Ottawa	$1,312,481	$1,157,889
CRTI 02-0067RD	Restoration of Facilities and Areas After a CBRN Attack	CHEM	EC	$1,973,032	$1,943,359
CRTI 02-0093TA	Advanced Polymer Research for Application to Personnel Protective Clothing	CHEM	DRDC Ottawa	$1,026,911	$597,000
CRTI 03-0009RD	Caring About Healthcare Workers at First Responders: Enhancing Capacity for Gender-Based Support Mechanisms in Emergency Preparedness Planning	CHEM	HC	$1,089,817	$1,095,839
CRTI 03-0013TD	Early CBRN Attack Detection by Computerized Record Surveillance (ECADS)	CHEM	NRC	$1,764,799	$900,000
CRTI 03-0019TD	Real-time Bio-surveillance and response readiness	CHEM	PHAC	$1,798,592	$2,898,000
CRTI 03-0023TD	Portable and Collapsible Chem/Bio Isolators	CHEM	CSIS	$514,260	$581,543
CRTI 04-0018RD	Development of standards for chemical and biological decontamination of buildings and structures affected by terrorism	CHEM	EC	$2,710,000	$2,822,224

CRTI 04-0019TD	Field Demonstration of Advanced CBRN Decontamination Technologies	CHEM	EC	$811,165	$1,223,604
CRTI 04-0022RD	Rapid Separation and Identification of CBW Agents and Consumer Matrices using FAIMS Technology	CHEM	NRC	$448,499	$750,118
CRTI 04-0082TA	RF and ECM Compatible CB-Blast Protective Helmet	CHEM	RCMP	$400,000	$391,522
CRTI 05-0016RD	Development of Canadian Standard for Protection of First Responders from CBRN events	CHEM	PWGSC	$549,978	$1,072,014
CRTI 05-0069RD	Development of PEGylated Granulocyte-Macrophage Colony Stimulating Factor for Acute Radiation Syndrome	CHEM	HC	$1,370,852	$1,279,986
CRTI 05-0092TA	Integrated Personal Cooling for Chemical-Biological Protective Undergarments	CHEM	RCMP	$260,000	$185,628
CRTI 06-0169TA	Universal Surface Decontamination Formulation	CHEM	EC	$1,666,428	$1,292,316
CRTI 06-0170RD	Organophosphorus agent decontamination	CHEM	EC	$1,946,043	$1,629,769
CRTI 06-0192TD	CBRN respiratory fit-testing program development	CHEM	RMC	$1,022,505	$592,707
CRTI 06-0234TA	Advanced Syndromic Surveillance and Emergency Triage (ASSET)	CHEM	NRC	$2,000,000	$1,251,717
CRTI 06-0255TA	Medical and Casualty Management Command Post and Temporary Treatment Center (MedPost)	CHEM	DRDC Ottawa	$2,085,018	$1,419,479
CRTI 06-0283RD	Addressing deficiencies in All-Hazard Respiratory Protection for First Responders	CHEM	RMC	$ -	$ -
CRTI 06-0299TA	Polymer Nanocomposite Barrier Fabric for First Responder Protection and Containment Operations	CHEM	DRDC Suffield	$581,700	$294,706
CRTI 07-0150TD	Casualty Care Continuum (from event scene to emergency department)	CHEM	HC	$1,893,000	$1,086,129
CRTI 08-0233TD	An HI-6 based intravenous product for nerve-agent post-treatment	CHEM	DRDC Suffield	$1,660,000	$1,216,984
CRTI 08-0234TD	Modelling the Effects of Public/Animal Health Emergencies on Laboratories	CHEM	PHAC	$444,000	$795,722
CRTI 09-0438TA	Approval of CBRN personal protective equipment	CHEM	RMC	$1,999,053	$1,386,164
CRTI 09-0509TD	First Responder Immersive Training Simulation Environment	CHEM	DRDC Suffield	$1,982,927	$1,558,569
Chemistry Total	**36 Projects**			**$52,430,701**	**$58,512,920**

CRTI 04-0030TD	Nuclear Forensics Response Capabilities and Interoperability	Forensic	DRDC Ottawa	$283,160	$407,600
CRTI 04-0047TD	Chemical, Biological, Radiological and Nuclear Incident Database	Forensic	RCMP	$1,662,749	$1,251,145
CRTI 04-0112TD	Container Intrusive Sampling System	Forensic	RCMP	$137,805	$214,500
CRTI 05-0053TA	Deployable RN Incident Area Network: Wireless Mesh Topology	Forensic	HC	$ -	$ -
CRTI 05-0058TD	Unified Interoperability Solution set to Support CONOPS Framework Development - Municipal-Provincial-Federal Collaboration to	Forensic	DRDC Ottawa	$1,500,000	$2,042,616

	CBRN Response				
CRTI 05-0121RD	Evidence-Based Risk Assessment of Improvised CB weapons	Forensic	CSIS	$658,939	$768,796
CRTI 05-0122TD	CBRN Crime Scene Modeler (C2SM)	Forensic	RCMP	$1,601,328	$858,639
CRTI 05-0123TD	All-Hazards Sample Receiving Storage	Forensic	DRDC Suffield	$2,300,400	$1,752,162
CRTI 06-0202TD	Short-Range BioSpectra: A Device for the Surveillance of Bioaerosol in Large Indoor, Semi-Enclosed and Outdoor Spaces	Forensic	DRDC Valcartier	$1,187,524	$747,109
CRTI 06-0275TD	Integrated Two-Way Radio Radiation Sensors	Forensic	RCMP	$2,248,463	$1,327,014
CRTI 06-0317TD	PROBE –Crime Scene Support Tool for Police, Hazmat & EMS	Forensic	RCMP	$3,469,390	$1,734,695
CRTI 06-0318TD	Higher Education Cooperative for Hazardous Materials and Equipment Tracking (HECHMET)	Forensic	RCMP	$3,873,704	$2,202,890
CRTI 06-0319TD	Guidelines for Combined Air Demand and Heat Strain Management of First Responders	Forensic	DRDC Toronto	$1,631,790	$1,102,224
CRTI 07-0148TD	Decontamination and Mitigation Techniques for C,B and E Agents and the Effect on Forensic Evidence	Forensic	DRDC Suffield	$1,141,200	$764,804
CRTI 07-0216TA	Fast CBRNE Crime Scene Modeler (fC2SM)	Forensic	RCMP	$2,095,660	$1,199,482
CRTI 07-0193RD	A Compton Gamma Imager for Criminal and National Security Investigation	Forensic	NRCan	$1,425,258	$1,536,880
CRTI 07-0219RD	Microbial Forensics Project	Forensic	PHAC	$2,740,000	$1,523,376
CRTI 08-0105RD	The Development of a Canadian CBRNE Recommended Equipment List	Forensic	CPRC	$800,000	$755,984
CRTI 08-0116RD	Forensic Attribution of CBRNE Materials: A Chemical Fingerprint Database	Forensic	PSC	$1,500,000	$861,000
CRTI 08-0192TD	Emergency Resource Inventory Network (ERIN)	Forensic	PSC	$1,850,000	$959,131
CRTI 08-0197TD	Capability Based Planning Validation Project / CBRN-E Rapid Assessment Team	Forensic	PSC	$400,000	$205,800
CRTI 08-0226TD	Capability Based Planning Validation Project / CBRN Mass Decontamination	Forensic	PSC	$400,000	$204,840
Forensic Total	**22 Projects**			**$32,907,370**	**$22,420,687**

CRTI 02-0080RD	Psychological Risk Assessment and Management (9RAM) Tools to Enhance Response to CBRN Attacks and Threats in Canada	Psycho-social	PHAC	$2,314,729	$1,866,320
CRTI 06-0259TD	Psychosocial Risk Manager (PRiMer): Computer-based Pre-Event Training	Psycho-social	PHAC	$1,968,790	$2,522,500
CRTI 07-0135RD	Building Resilience and Rural Health System Capability for Pre-disaster Planning and Preparedness	Psycho-social	PHAC	$1,930,500	$1,431,041
CRTI 08-0180TD	Establish an integrated National CBRNE Training System for Health, Psychosocial and Communication Responders	Psycho-social	PHAC	$2,260,000	$1,307,000

CRTI 08-0176RD	Enhancing Resilience Among High Risk Populations to Maximize Disaster Preparedness	Psycho-social	PHAC	$1,922,250	$1,135,000
CRTI 08-0114RD	Mainstreaming Psychosocial Considerations and Emergency Management Planning Building Confidence and Changing Culture	Psycho-social	HC	$2,217,513	$1,418,091
CRTI 09-0428RD	National security data initiative enhancing the Canadian evidence base for policy and operations	Psycho-social	PSC	$1,310,000	$1,554,000
Psychosocial Total	**7 Projects**			**$13,923,782**	**$11,233,952**

Total Listed	**103 Projects**	**$170,165,145**	**$167.991,406**
Grand Total (all CRTI projects)	**166 Projects**	**$256,442,447**	**$257,340,450**

CONFIDENCE BUILDING MEASURE A, Part 2 (iii)

National Biological Defence Research and Development Program

Facilities

1. **Defence Research and Development Canada – Suffield (DRDC Suffield)**

A. The facility is located in Buildings 1, 10, 60, 600, 610 and the Colin Watson Aerosol Layout (CWAL) and associated minor structures, all co-located with Canadian Forces Base Suffield near the village of Ralston, Alberta, Canada. The postal address is

Director General
DRDC Suffield
Box 4000 Station Main
Medicine Hat, Alberta T1A 8K6
CANADA

B. Floor area of laboratory areas by containment level:

BL2 - 492 m^2
BL3 - 159 m^2
BL4 - 0 m^2

The total laboratory floor area in Building 1 used for biological defence work is 868 m^2. An Aerosol Test Facility containing 38 m^2 of lab space is located next to Building 1; another aerosol test facility containing 33 m^2 of lab space is located at the CWAL field site. Building 10 is a vivarium and includes general laboratory space. The area of the vivarium is 1134 m^2. Building 610 occupies 76 m^2 of space. Field facilities for biological agent training exist in the vicinity of Building 60.

C. The organizational structure of each facility at 30 November 2012[1]:

(i) Total number of personnel 36.6

(ii) Division of personnel

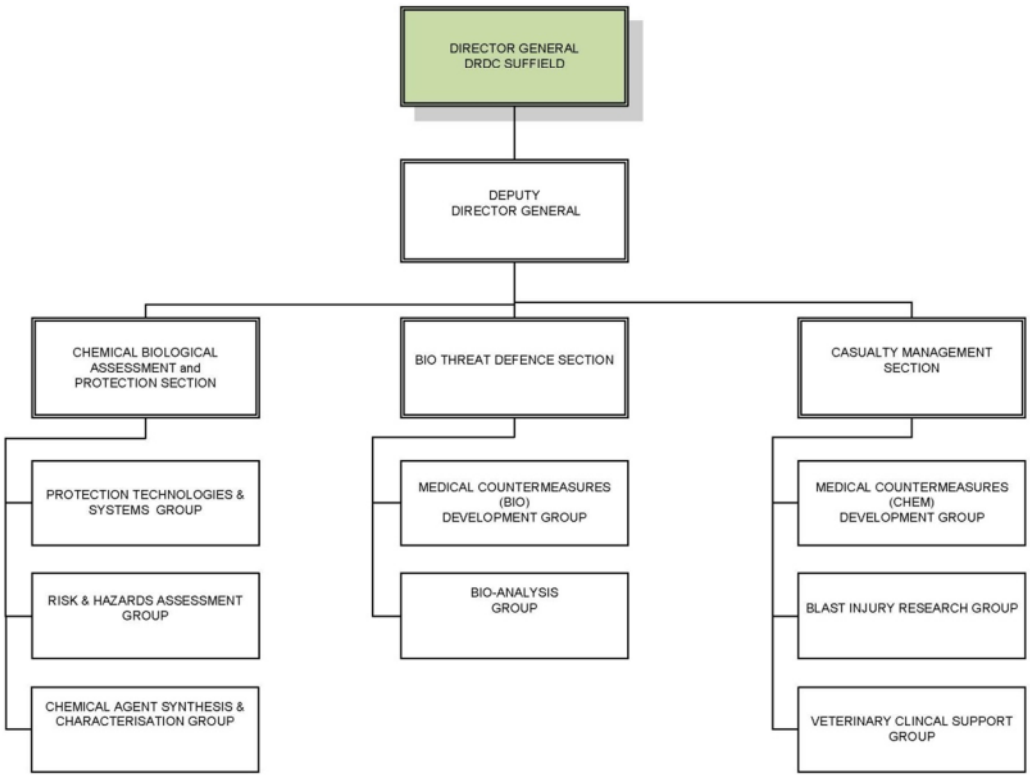
Military	1.5
Civilian	35.1

(iii) Division of personnel by category

Scientists	21.5
Engineers	0.0
Technicians	13
Admin. and support staff	2.1

[1] The chemical and biological defence programs at this facility are fully integrated. The data presented herein is therefore a best estimate as to the portion that is affected to biological defence.

(iv) Organization Chart and disciplines represented in the DRDC Suffield research and development program in biological defence



Disciplines

Bacteriology	Immunology
Microbiology	Virology
Chemistry	Biochemistry
Biotechnology	Veterinary Medicine
Medicine	Pharmacology

(v) There are two contractor staff working in biological defence at this facility, working to develop medical countermeasures to, and detection of BW agents and toxins. A list of contractors carrying out R&D in biological defence is attached.

(vi) The research in this facility is 100% funded by the Departments of National Defence and Public Safety Canada and under contract to, or through collaborative agreements, with other government departments and industry.

Funding level estimates (including salaries): $5,763,150

(vii) Estimate of funding levels for the following program areas:

Research	$4,319,000
Development	$1,108,650
Test and Evaluation	$335,500

(viii) All staff are encouraged to publish the results of their research in the open literature whenever not precluded by security or intellectual property considerations. There is also an internal publication system which is used for publications regardless of content. See attached list of publications (Form C).

(ix) A list of publicly-available papers and reports is annexed.

D. The biological defence program at DRDC Suffield is outlined in Form A, part 2, (ii), paragraph 1 and additional details follow. Assessment of the hazards from biological agents and toxins involves research to understand the dispersion of such agents and is carried out by mathematical modelling techniques. Part of the work in detection involves R&D leading to the production of field portable chemical/biological agent detection systems. In medical countermeasures, research is carried out on new drugs and vaccines and delivery systems, for example microencapsulated antibiotics and vaccines. Microorganisms other than Newcastle disease virus (NDV) and *Bacillus subtilis var. niger* (formerly *Bacillus globigii* (BG)) which have been used in the biological defence program are *Bacillus anthracis*, *Brucella* species (*abortus*, *melitensis*, *neotomae*, *ovis* and *suis*), *Burkholderia* species (*mallei*, *pseudomallei*) *Francisella tularensis*, *Mycobacterium tuberculosis*, *Yersinia enterocolitica*, *Yersinia pestis*, various influenza virus strains, western equine encephalitis, eastern equine encephalitis, Venezuelan equine, encephalitis, Highlands J virus, Sindbis virus and dengue virus (serotypes 1-4). Toxins used include botulinum toxin, staphylococcal enterotoxin B, ricin and various venoms from marine organisms, reptiles and insects. In the early to mid-1980s, outdoor studies have involved only NDV middle through 1980's and BG.

2. Defence R&D Canada – Valcartier (DRDC Valcartier)

A. The facility is located in buildings 14 and 25 and an aerosol chamber for Lidar measurements is located at about 300 m from building 25 (also on the main laboratory area complex). The postal address is:

Director General
DRDC Valcartier
2459 Boul. Pie XI Nord
Québec, Québec, G3J 1X5
CANADA

B. Floor area of laboratory areas in Building 14 and 25 by containment level:

BSL1 - 165 m^2

A new BSL1 laboratory has been inaugurated in July 2011 to support the standoff biodetection program. The aerosol chamber (2m x 2m x 22m) located outside of building 25 is used to characterize standoff biodetection systems under development with fluorescing aerosols simulating bioaerosols.

C. The organizational structure of the personnel contributing to this activity is:

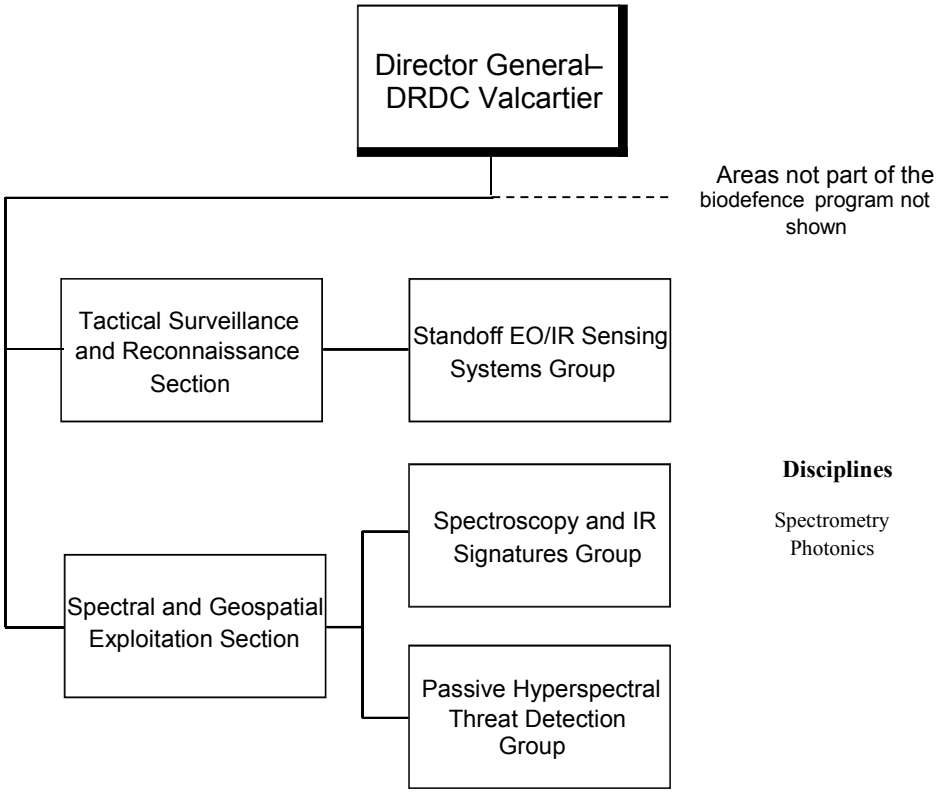
i. total number of personnel 4

ii. division of personnel
civilian 4

iii. division of personnel by category

scientists	2.5
managers	0.5
technicians	1
admin. and support staff	0

iv. Organization Chart and disciplines represented in the DRDC Suffield program in biological defence



v. There are contractor staff working in biological defence at this facility. Contractors are working in management and technical support to the standoff biodetection program. A list of contractors carrying out R&D in biological defence is attached.

vi. The research in this facility is 100% funded by the Departments of National Defence and Public Safety Canada and under contract to, or through collaborative agreements, with other government departments and industry.

vii. Funding level estimates (including salaries): $1,170,000

viii. All staff are encouraged to publish the results of their research in the open literature whenever not precluded by security or intellectual property considerations. There is also an internal publication system which is used for publications regardless of content.

ix. See attached list of publications (Form C).

D. The biological defence program at DRDC Valcartier is focused on the detection of biological agents and toxins using photonic detection methods. This involves R&D leading to the production of field portable biological agent detection systems.

List of Contractors
Carrying Out Research and Development in Biological Defence
for the Department of National Defence of Canada - 2012

Contractor	Title
AEREX Avionics Inc. Breakeyville, QC	Managing and technical supports to the BioSense TDP (standoff biodetection)
Advanced Integrated Microsystems Ltd, Vancouver, BC	Micro-Based Sample Processing for Bioanalysis and Mass Spectrometry
Alberta Ingenuity Centre for Carbohydrate Science, University of Alberta, Edmonton, AB	Production of Recombinant Conjugate Vaccine Candidates against *Burkholderia pseudomallei*
Canada West Biosciences Inc, Calgary, AB	Preclinical Evaluation of Nucleic Acid-Based Antiviral Agents Investigating Novel, Universal Therapeutics Against All Serotypes of Botulinum Neurotoxins
Chronix Biomedical, San Jose, CA, USA	Diagnostic Biomarkers from Circulating Nucleic Acids
College of Veterinary Medicine China Agriculture University, China	Avian Influenza Infections and Cytokine Storm
Laboratory for Advanced Genome Analysis, The Prostate Centre at Vancouver General Hospital, Vancouver, BC	Genetic Screening (Microarray Analysis) for Detectable Biomarkers in Early Stages of Acute Infection
Les instruments optiques du Saint-Laurent Inc., Mirabel, QC	Lidar technology support to the BioSense TDP (standoff biodetection)
MacDonald Dettwiler and associates Ltd, Richmond, BC	Processing of the data produced during the BioSense TD trials, and production of the performance parameters of the BioSense sensor Construction of the BioSense demonstrator (standoff biodetection)
Microarray Facility at the Prostate Centre, University of BC, Vancouver, BC	Microarray Analysis Following Nucleic Acid-Based Drug Treatment
Northern Lipids Inc., Vancouver, BC	Nasal Spray Against Avian Influenza
Oncovir Inc., Washington, DC, USA	Development of Nasal Spray Formula
Pusat Studi Primata, Institut Pertanian Bogor, Agricultural University, Bogor, Indonesia	Antiviral Testing
Toxtest - RnRx - Alberta Innovates - Technology Futures, Vegreville, AB	Preclinical Trials and Long Term Animal Studies

Contractor	Title
University of Ottawa, Research Partnerships, Technology Transfer & Business Enterprise, Ottawa, ON	Immunological Support for Biothreat Agent Detection Using Novel Antibodies
University of Saskatchewan, Saskatoon, SK	Antiviral Drug Test in a Ferret

CONFIDENCE BUILDING MEASURE B

Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins

At the Third Review Conference it was agreed that States Parties continue to implement the following:

> Exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins, and on all such events that seem to deviate from the normal pattern as regards type, development, place, or time of occurrence. The information provided on events that deviate from the norm will include, as soon as it is available, data on the type of disease, approximate area affected, and number of cases.

The Seventh Review Conference agreed the following:

> No universal standards exist for what might constitute a deviation from the normal pattern.

Modalities

The Third Review Conference agreed on the following, later amended by the Seventh Review Conference:

1. Exchange of data on outbreaks that seem to deviate from the normal pattern is considered particularly important in the following cases:

> - when the cause of the outbreak cannot be readily determined or the causative agent10 is difficult to diagnose;
>
> - when the disease may be caused by organisms which meet the criteria for risk groups III or IV, according to the classification in the latest edition of the WHO Laboratory Biosafety Manual;
>
> - when the causative agent is exotic to a given geographical region;
>
> - when the disease follows an unusual pattern of development;
>
> - when the disease occurs in the vicinity of research centres and laboratories subject to exchange of data under item A; and
>
> - when suspicions arise of the possible occurrence of a new disease.

2. In order to enhance confidence, an initial report of an outbreak of an infectious disease or a similar occurrence that seems to deviate from the normal pattern should be given promptly after cognizance of the outbreak and should be followed up by annual reports. To enable States Parties to follow a standardized procedure, the Conference has agreed that Form B should be used, to the extent information is known and/or applicable, for the exchange of annual information.

3. The declaration of electronic links to national websites or to websites of international, regional or other organizations which provide information on disease outbreaks (notably outbreaks of infectious diseases and similar occurrences caused by toxins that seem to deviate from the normal pattern) may also satisfy the declaration requirement under Form B.

4. In order to improve international cooperation in the field of peaceful bacteriological (biological) activities and in order to prevent or reduce the occurrence of ambiguities, doubts and suspicions, States Parties are encouraged to invite experts from other States Parties to assist in the handling of an outbreak, and to respond favourably to such invitations, respecting applicable national legislation and relevant international instruments.

Background information of nationally notifiable diseases: Animal Health

DEFINITION: Reportable diseases

These diseases are listed in the Health of Animals Act and Regulations and are usually of significant importance to human or animal health or to the Canadian economy.

The list of "reportable" diseases includes all of the previously called OIE List A diseases. Reportable diseases are transmissible diseases which have the potential for very serious and rapid spread, irrespective of national borders, which are of serious socio-economic or public health consequence and which are of major importance in the international trade of animals and animal products.

DEFINITION: Notifiable diseases

In Canada, there is a second list of diseases, called "notifiable", which also need to be reported to the veterinary administration (CFIA) on an immediate or annual basis. In general, immediately notifiable diseases are diseases exotic to Canada for which there are no control or eradication programs. Notifiable diseases are the transmissible diseases which are considered to be of socio-economic and/or public health importance within countries and which are significant in the international trade of animals and animal products.

The reports to OIE are posted on the new World Animal Health Information Database (WAHID) Interface website: http://www.oie.int/wahid-prod/public.php?page=home. Any additional written reports to the OIE will also be posted directly on the CFIA website.

CONFIDENCE BUILDING MEASURE B

Information on outbreaks of infectious diseases and similar occurrences, that seem to deviate from the normal pattern

Public Health Agency of Canada

Pertussis

Pertussis is an endemic disease in Canada. An annual average of 1,318 cases (or 3.9 cases per 100,000 population) pertussis cases were reported to PHAC from 2007 to 2011. Since the last major peak in 1998, pertussis incidence in Canada has been on a steady decline. However, in 2012, a number of Canadian provinces and territories have reported an increase in pertussis activity including British Columbia, Alberta, Manitoba, Ontario, Quebec, New Brunswick and the Yukon. New Brunswick in particular experienced a province-wide outbreak that began in early 2012. From January 1st to July 31st 2012, 2,671 cases were reported, resulting in a crude annualized incidence of 13.3 cases per 100,000 person-years.

Three deaths have been reported in 2012 in infants less than two months of age in Canada. Based on preliminary data, outbreaks occurring across the country are not limited to one specific age group or to those who are unimmunized, but instead vary by jurisdiction. In light of increasing pertussis activity in the Region of the Americas, the Pan American Health Organization / World Health Organization (PAHO/WHO) has issued an epidemiological alert encouraging Member States to increase vigilance around pertussis. In response, and in collaboration with the provinces and territories, PHAC has convened a multi-disciplinary community of experts to discuss existing pertussis research and identify research gaps that could be addressed to inform pertussis management in Canada.

PHAC/National Advisory Committee on Immunization (NACI) release an updated version of the pertussis chapter in the Canadian Immunization Guide in December 2012. Also, in light of the shortage of Quadracel® that was identified in 2012, NACI is currently developing a statement which examines the evidence around differences in reactogenicity, immunogenicity, efficacy and/or effectiveness when using a lower dose pertussis product versus a higher dose pertussis product. NACI also intends to examine the evidence on pertussis vaccine in pregnancy and post-partum.

Legionellosis

Legionella bacteria is associated with two types of illness in humans, Legionnaire's disease and Pontiac fever, and are found in natural water source such as lakes, rivers, ponds, and streams. The number of bacteria and the type found determine the risks for humans. Stagnant water, warm temperatures (especially between 20 and 50°C) and the presence of biofilm, scale and sediment promote the growth of the bacteria.

Between 1986 and 2011, a mean of 100 cases (range 42-252) of legionellosis were reported annually in Canada. This corresponds to an average annual incidence of approximately 0.33 cases per 100,000 (range 0.13-0.72 per 100,000). In 2005, a sharp increase in cases occurred nationally which was likely a result of a large outbreak of Legionnaires' in a long-term care facility in Ontario (with 127 ill and 21 deaths). However, an increasing trend has continued to be

observed since 2005. The national increase in cases appears to be driven by Ontario, Quebec, New Brunswick, and Alberta.

In July of 2012, an outbreak of Legionella was identified in Quebec City, QC. A total of 180 confirmed cases and 13 deaths were reported in connection with this outbreak, and a cooling tower was identified as the source. Samples were taken on August 21 and 28, and laboratory analyses identified the same bacteria that had been recovered from outbreak-related cases. A group of targeted towers were disinfected on August 24, 2012, and the affected tower was stopped by the owner on September 18, 2012. Authorization of the restart of the fans required certification that the tower met operating criteria developed by the Building Board of Quebec in collaboration with external experts solicited by the Quebec City Regional Director of Public Health.

Escherichia coli

E. coli O157 illnesses reported in Canada have been declining over the past several years, there were 1194 cases (or 3.80 per 100 000 population) reported in 2002 compared to 482 cases (1.39 per 100 000) in 2011 to the National Enteric Surveillance Program . The number of E. coli O157 cases reported in 2012 was very similar to 2011, with preliminary numbers indicating about 485 E.coli O157 infections reported nationally. The total annual number of cases reported in Canada were not elevated in 2012 despite a high profile nation wide recall of beef and the related outbreak investigation.

General Trends in Sexually Transmitted Infections and Hepatitis

Trends in the rates of sexually transmitted infections and hepatitis have been changing recently for a variety of reasons, outlined below.

Chlamydia

Rates of reported cases of chlamydia have been increasing steadily since 1997, when more sensitive laboratory tests were introduced in Canada. Thus, part of the increase in rates can be attributed to improved detection of infections among those who are tested. Other postulated reasons for the increase in reported chlamydia rates include increased case finding (through contact tracing and improved screening), and an actual increase in incidence due to changes in behaviour at the population level. Data to support any of these theories are limited. However, there have been no recent reports of chlamydia outbreaks in any Canadian jurisdiction to explain the increase. The observed increase in reported chlamydia rates in 2011 is in line with the longer-term trend.

Gonorrhea

Trends in gonorrhea demonstrate an increase in rates of reported cases starting in 1997; however, as of 2009 rates are beginning to level out. Antimicrobial resistance in gonorrhea is a serious concern, with recent data showing decreasing susceptibility to current first-line treatments. Resistant gonorrhea infections can result in treatment failure, with a possible continued resurgence in cases.

Hepatitis B
While an increase in hepatitis B cases overall (i.e., acute and chronic cases combined) has been observed recently, this may be attributable to changes in case counting and reporting to the Public Health Agency of Canada. Trends in acute hepatitis B actually indicate a decrease in the rate of reported cases. Routine childhood immunization for hepatitis B in Canada has reduced the occurrence of large-scale outbreaks; occasional sporadic transmission of hepatitis B infections has been limited to small groups (e.g. a small 2006 outbreak limited to household transmission in several families in New Brunswick).

Hepatitis C
Reported rates of hepatitis C have decreased since 2005.

Infectious syphilis
The reported rate of infectious syphilis was maintained below 1.0 per 100,000 for several years prior to 2002, when rates started to increase due to outbreaks in several jurisdictions. In recent years, sustained high reported rates of infectious syphilis have been documented in British Columbia, Alberta, Ontario, and Québec, concentrated mainly in large urban centres, suggesting that syphilis is once again becoming endemic in much of Canada. More recent outbreaks have occurred or are in progress in Nunavut, the Northwest Territories, Saskatchewan, Nova Scotia, and New Brunswick. Outbreaks are often associated with travel between jurisdictions in Canada or outside of the country. Men who have sex with men are one of the most affected groups; however, outbreaks have also been seen in heterosexual men and women, with resulting increases in congenital syphilis in infants. Injection drug use and involvement in the sex trade have been implicated in some jurisdictions. Public health response to the increase in infectious syphilis has included communication to health care providers to raise awareness and increase testing, internet-based awareness campaigns directed at the general population, and testing "blitzes" among the populations most affected.

CONFIDENCE BUILDING MEASURE C

Encouragement of publication of results and promotion of use of knowledge

At the Third Review Conference it was agreed that States parties continue to implement the following:

> Encouragement of publication of results of biological research directly related to the Convention, in scientific journals generally available to States parties, as well as promotion of use for permitted purposes of knowledge gained in this research.

Modalities

The Third Review Conference agreed on the following:

> 1. It is recommended that basic research in biosciences, and particularly that directly related to the Convention should generally be unclassified and that applied research to the extent possible, without infringing on national and commercial interests, should also be unclassified.
>
> 2. States parties are encouraged to provide information on their policy as regards publication of results of biological research, indicating, *inter alia*, their policies as regards publication of results of research carried out in research centres and laboratories subject to exchange of information under item A and publication of research on outbreaks of diseases covered by item B, and to provide information on relevant scientific journals and other relevant scientific publications generally available to States parties.
>
> 3. The Third Review Conference discussed the question of cooperation and assistance as regards the safe handling of biological material covered by the Convention. It concluded that other international forums were engaged in this field and expressed its support for efforts aimed at enhancing such cooperation.

CONFIDENCE BUILDING MEASURE C

Encouragement of Publication of Results and Promotion of Use of Knowledge

Note: Publication and knowledge sharing is strongly encouraged and a cornerstone of the CRTI.

Public Health Agency of Canada

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Name: Hana Weingartl
Title: "Emerging Diseases"
Date: January 29, 2012
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Name: Hana Weingartl
Title: "Rift Valley Fever"
Date: January 30, 2012
Event: Foreign Animal Disease Course

Name: Hana Weingartl
Title: "Diagnostic Developments for High Consequence Animal Pathogens"
Date: June 5, 2012
Event: Canadian Animal Health Laboratorians Network (CAHLN), Winnipeg, Canada

Name: Hani Boshra
Title: "Development of Vaccines for the Prevention of Viral Diseases in Livestock in Africa"
Date: June 5, 2012
Event: Canadian Animal Health Laboratorians Network (CAHLN), Winnipeg, Canada

Name: Beata Stachowiak
Title: "Nipah Virus Infects Specific Subsets of Porcine Perpheral Blood Mononuclear Cells"
Date: June 5, 2012
Event: Canadian Animal Health Laboratorians Network (CAHLN), Winnipeg, Canada

Name: Mingyi Li
Title: "A New Novel Penside Strip Test for the Detection of Nipah Virus in Swine"
Date: June 5, 2012
Event: Canadian Animal Health Laboratorians Network (CAHLN), Winnipeg, Canada

Name: Charles Nfon
Title: "Possible Involvement of Chemokines and Proinflammatory Cytokines in the Pathogenesis of Pulmonary Disease in Zaire Ebola Virus-Infected Pigs"
Date: June 5, 2012
Event: Canadian Animal Health Laboratorians Network (CAHLN), Winnipeg, Canada

Presenter: Kingsley Amoako
Title: Genomics at Work: Relevance to foodborne bioterrorism threat
Date: February 21, 2012
Event: CRTI Workshop on Genomics and Bioinformatics, Ottawa, Ontario

Presenter: Kingsley Amoako
Title: Genotyping of anthrax isolates from disease outbreaks in Canada
Date: June 5, 2012
Event: 11th Annual Canadian Animal Health Laboratorians Network Meeting, Winnipeg, Canada

Presenter: Kingsley Amoako
Title: Decon of anthrax spores in food grease
Date: October 10, 2012
Event: CRTI Workshop on Decontamination

Poster Presentations for 2012

Presenter: Kingsley Amoako
Title: Rapid detection of *Yersinia pestis* in food using pyrosequencing technology
Date: May 21, 2012
Event: International Association for Food Protection's European Symposium on Food Safety; Warsaw, Poland

Presenter: Kingsley Amoako
Title: Science and technology solutions to mitigate vulnerabilities in Canada's food supply
Date: June 14, 2012
Event: CRTI Summer Symposium, Ottawa, Ontario

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Stratilo, C.W. and Bader, D.E.. Genetic diversity among *Bacillus anthracis* soil isolates at fine geographic scales. *Appl. Environ. Microbiol.,* 2012, 78:6433-6437.

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N.W.C. Chan and S.L. Hayward, Countering the Biological Threat in an Asymmetric World: A Way Forward in Biological Detection, Identification and Diagnostics, DRDC Suffield TM 2011-172.

Chan, N.W.C., Lee, W.E., Wood, C., Gebremedhin, M., and Mah, D., Identification of receptors and antagonists to botulinum toxin A, DRDC Suffield TR 2011-182.

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CONFIDENCE BUILDING MEASURE E

Declaration of Legislation, Regulations and Other Measures

At the Third Review Conference the States parties agreed to implement the following, later amended by the Seventh Review Conference:

> As an indication of the measures which they have taken to implement the Convention, States parties shall declare whether they have legislation, regulations or other measures:
>
> (a) To prohibit and prevent the development, production, stockpiling, acquisition or retention of the agents, toxins, weapons, equipment and means of delivery specified in Article I of the Convention, within their territory or anywhere under their jurisdiction or under their control anywhere;
>
> (b) In relation to the export or import of micro-organisms pathogenic to man, animals and plants or of toxins in accordance with the Convention;
>
> (c) In relation to biosafety and biosecurity.

States parties shall complete the attached form (Form E) and shall be prepared to submit copies of the legislation or regulations, or written details of other measures on request to the Implementation Support Unit (ISU) within the United Nations Office for Disarmament Affairs or to an individual State party. On an annual basis States parties shall indicate, also on the attached form, whether or not there has been any amendment to their legislation, regulations or other measures.

Relation to	Legislation	Regulations	Other Measures	Amended since Last Year
a) Development, production stockpiling, acquisition or retention of microbial or other biological agents, or toxins, weapons, equipment and means of delivery specified in Article I.	YES	YES	YES	YES
b) Exports of microorganisms* and toxins.	YES	YES	YES	YES
c) Imports of microorganisms* and toxins.	YES	YES	YES	YES

* Microorganisms pathogenic to man, animals and plants in accordance with the Convention.

For more information, please consult the Canadian report entitled Biosafety, Biosecurity, and Biological Non-Proliferation Legislation, found on the website of Foreign Affairs and International Trade Canada, at http://www.international.gc.ca/arms-armes/non_nuclear-non_nucleaire/bio_legislation-bio_lois.aspx, and on the website of the Implementation Support Unit, at www.unog.ch/bwc.

CONFIDENCE BUILDING MEASURE F

In the interest of increasing transparency and openness, States parties shall declare whether or not they conducted any offensive and/or defensive biological research and development programmes since 1 January 1946.

If so, States parties shall provide information on such programmes, in accordance with Form F.

Declaration of Past Activities in Offensive and/or Defensive Biological Research and Development Programs

1. Date of Entry into Force - 26 March 1975 (Deposit 18 September 1972)

2. Past offensive biological R&D programs:

a. Yes.
b. 1 Jan 46 to 30 Jun 58
c. In the above period offensive work undertaken by Canada included: studies of improved procedures for production of certain toxins (eg. botulinum and diphtheria); studies on the use of insects as vectors for pathogenic bacteria and viruses; test and evaluation of munitions, including performance in cold weather; studies of weapon-produced aerosols of potential BW agents; fundamental work related to field trials, dealing with the dispersion and properties of solid particulates, preparation of finely divided solids for munitions charging and sampling of toxic particulates; development of tissue culture processes for large scale cultivation of viruses; and development of *Burkholderia mallei* and *Burkholderia pseudomallei* as new potential BW agents and continued work on *Brucella suis* and *Pasteurella tularensis* as BW agents. There was no large scale production, stockpiling or weaponization of BW agents. When necessary, BW agents were destroyed by autoclaving.

3. Past defensive biological R&D programs:

a. Yes.
b. 1 Jan 46 to present
c. A key factor in biological defence work is that it is only through a thorough understanding of the properties and behaviour of potential BW agents that the potential threat can be appreciated, and work on suitable defensive measures can be undertaken. Accordingly, in the past there was much basic research on such agents, as well as studies of their characteristics and behaviour as aerosols. The aerosol work included studies to delineate the factors responsible for the losses of viability in airborne bacteria and viruses during long-distance aerosol transport. The aim was to better understand the feasibility of large scale use of BW agents. Medical work in biological defence has covered research and development, and in some cases production of toxoids, antitoxins and vaccines for various potential BW agents including *Botulinum* toxin, Rinderpest virus, Newcastle Disease virus, *B. mallei*, *F. tularensis* and Diphtheria toxin. More recent work in biological defence is summarized in Form A, part 2.

CONFIDENCE BUILDING MEASURE G

Declaration of Production Facilities

To further increase the transparency of biological research and development related to the Convention and to broaden scientific and technical knowledge as agreed in Article X, each State party will declare all facilities, both governmental and non-governmental, within its territory or under its jurisdiction or control anywhere, producing vaccines licensed by the State party for the protection of humans. Information shall be provided on Form G attached.

List of Human Vaccine Manufacturing Facilities in Canada

Name of Facility	Location(s)	Activity
ID Biomedical Corporation of Quebec (GlaxoSmithKline Inc.)	Quebec City, Quebec	Manufacturer of vaccines for use in humans.
Sanofi Pasteur Limited	Toronto, Ontario	Manufacturer of vaccines for use in humans.

List of Veterinary Biologics (vaccine) Manufacturing Facilities in Canada

Includes facilities that are currently licensed to manufacture veterinary biologics under a *Veterinary Biologics Establishment Licence*, issued by the Veterinary Biologics Section of the Canadian Food Inspection Agency, under the *Health of Animals Act and Regulations*.

Name of Facility	Location(s)	Activity
Artemis Technologies Inc. Can. Vet. Biol. Estab. Lic. No. 50	Guelph, Ontario	Manufacturer of veterinary vaccines for use in animals.
Bioniche Life Sciences Inc. Can. Vet. Biol. Estab. Lic. No. 8	Belleville, Ontario	Manufacturer of veterinary vaccines and antibody products for use in animals.
Biovet Inc. Can. Vet. Biol. Estab. Lic. No. 49	Saint-Hyacinthe, Québec	Manufacturer of *in vitro* diagnostic test kits for diagnosis of animal diseases.
Gallant Custom Laboratories Inc. Can. Vet. Biol. Estab. Lic. No. 45	Cambridge, Ontario	Manufacturer of autogenous veterinary vaccines for use in animals.
Novartis Animal Health Canada Inc. Can. Vet. Biol. Estab. Lic. No. 40	Mississauga, Ontario	Manufacturer of veterinary vaccines for use in farm animals.

Novartis - Aqua Health Can. Vet. Biol. Estab. Lic. No. 40	Charlottetown (PEI) and Victoria (PEI)	Manufacturer of veterinary vaccines for use in aquaculture.
Nutratech Inc. Can. Vet. Biol. Estab. Lic. No. 58	Winnipeg, Manitoba	Manufacturer of egg antibody products for use in animals.
Pfizer Animal Health, Pfizer Canada Can. Vet. Biol. Estab. Lic. No. 4	Saanichton, British Columbia	Manufacturer of veterinary vaccines for use in aquaculture.
SRC Biomanufacturing **Saskatchewan Research Council**, Fermentation Technologies Branch Can. Vet. Biol. Estab. Lic. No. 57	Saskatoon, Saskatchewan	Manufacturer of veterinary vaccines for use in animals.
Saskatoon Colostrum Co. Ltd. Can. Vet. Biol. Estab. Lic. No. 44	Saskatoon, Saskatchewan	Manufacturer of bovine colostrum products for administration to animals.
Vetech Laboratories Inc. Can. Vet. Biol. Estab. Lic. No. 23	Guelph, Ontario	Manufacturer of veterinary vaccines for use in poultry.