松本城

MATSUMOTO Castle

The first place attacked
by Sarin June 1994

Regional Biosecurity Workshop

Singapore May 28-30, 2007

山は高く険しい

ジャンダルム

（日本北アルプス）

National Institute of Infectious Diseases
Takeshi KURATA (Toyama Institute of Health)

History of Biosafety in Japan (MHLW)

Started at National Institute of Health (Japan)

(Present: National Institute of Infectious Disease)

- 1973 Establishment of Biosafety Committee
- 1976 Risk Classification of Microbiological Pathogene
- 1976 Summary Data on Biohazard 1
- 1978 Summary Data on Biohazard 2
- 1981 Regulation on the Safety Control of Laboratories handling Pathogenic Agents
- 1981 Establishment of Maximum Safety Laboratory (BSL-4) in NIID

Academia, Ministry of Education, Culture, Sports, Science and Technology (MEXT), MHLW

1979 Rules for handling genetically modified living organisms (MEXT)

1993 Biosafety Guideline (Japanese Soc. Virology)

1993 Handling Rules of Microorganisms (Institute of Animal Health, Ministry of Agriculture)

1998 Biosafety Manual for handling Microorganisms (MEXT)

1999 Biosafety Guideline (Japanese Soc. Bacteriology)

Continued

1999 Law Concerning the Prevention of Infection and Medical Care for Patients of Infection

2002 Establishment of Japanese Biosafety Association (JBSA)

2004 Law Concerning the Conservation and Sustainable Use of Biological Diversity through Regulation on the Use of Living Modified Organisms

2006 Safety and Security Science and Innovation Strategy (Council for Science and Technology Policy, Cabinet office)

2006 Revised LCPIMCPI for Antiterrorism

- Regulation of Possession, Use and Transport:

The Japanese Biological Safety Association (JBSA)： founded in 19 Jan. 2002.

- To improve and develop the level of biosafety, JBSA steps up the research on biosafety-safety management, safety equipments and laboratory facility to handle pathogenic agents, and spreads knowledge of biosafety by education and training.
- To researcher for microorganism, animal science, biosafety officer in laboratory or hospital (diagnostic lab.) or manufacturer for biological products, and engineer for safety equipments, laboratory facility designer, maintenance staff, disinfection staff, medical doctors, veterinary doctors, clinical laboratory staff, health administration staff and other related persons who are interesting in biosafety.

The Japanese Biological Safety Association (JBSA)： founded in 19 Jan. 2002.

JBSA activity

To achieve the purpose, the work below is performed.

1 ） annual meeting, scientific meeting etc.

2 ） newsletter and journal in future etc.

3 ） biosafety education and training course etc.

4 ） affiliation to related national or international associations

5 ） the others

The Japanese Biological Safety Association (JBSA)： founded in 19 Jan. 2002.

President: Takeshi KURATA (NIID, Toyama Institute of Health)

Board of directors;

Aikichi IWAMOTO (Institute of Medical Science, Tokyo University)
Atuo KITABAYASHI (Yashima.Eco/System Co.LtD)
Toshihiko KOMATSU (NPO; Bio Medical Science Association)
Yuko SAGARA (Yokohama City Hospital)
Kazuyoshi SUGIYAMA (NIID)
Koichi YAMANISHI (NIBIO)
Haruo WATANABE (NIID)

Membership; 240

Secretariat:

Division of Biosafety Control and Research, NIID
1-23-1, Toyama, Shinjuku, Tokyo 162-8640
Tel: 81-3-5285-1111 ext.2420, Fax: 81-3-5285-1184
www.nih.go.jp/niid/meetings/index.html
ksugi@nih.go.jp

Membership of JBSA

MHLW

Quarantine stations

Regional Health administration

National Institute of Infectious Diseases (NIID)

University/ College

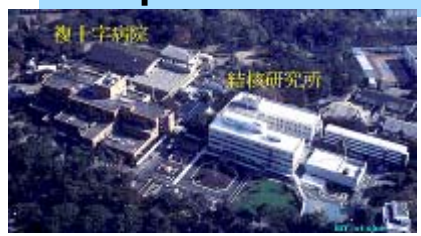
Company: Pharmaceutical, diagnostic lab, BSC and other equipments manufacture, maintenance, construction, disinfection, others

Membership 230
(supporting member 14)

N. I. of B.Med. Innovation

Institute of Science

Research Institute of Tuberculosis and Hospital



Incorporated foundation (biological substance manufacture) etc.

al

NPO Bio-medical Science Association

Others

Cooperation with domestic organization

- National Institute of Infectiou Diseases (NIID)
  (Biosafety management, international cooperation, translation of WHO guidance etc., training program and material)
- Regional Institute for Health (RIH)
  (Biosafety management, training program and material)
- Japan International Cooperation Agency (JICA)
  (Influenza and Biosafety training course from 2007)
- Other academic Association (Virology, Bacteriology, Infectious disease, Clinical Microbiology, Vaccine etc)
  (symposium, seminar)
- NPO Bio-medical Science Association (BMSA)
  (training program and material)
- Others

Cooperation with international organization

- American Biological Safety Association (ABSA)
- European Biological Safety Association (EBSA)
- Asia-Pacific Biological Safety Association (A-PBS)
- WHO;HQ/WHO;WPRO
- Others

Popularization of Idea on Biosafety and Biosecurity Practice according to international standards

-Through Symposium, Training course-

（約120人参加）

（80人参加）

JBSA Annual Conference

- Foundation meeting (Jan. 2002) Tokyo
- 2nd Annual meeting (Nov. 2002) Tokyo
- 3rd Annual meeting (Nov. 2003) Tokyo
- 4th Annual meeting (Nov. 2004) Yokohama
- 5th Annual meeting (Nov. 2005) Yokohama
- 6th Annual meeting (Nov. 2006) Tokyo
- 7th Annual meeting (Nov. 2007) Tokyo

JBSA Symposium

- 1st Symposium (2002)
  " Biosafety and Bioterrorism"
- 2nd Symposium(2005)
  "Biosecurity"
- 3rd Symposium(2005)
  "Transport of Pathogen"
- 4th Symposium(2007)
  "Revision of Infectious Disease Law"

5th JBSA meeting (2005)
The Special Session for Biosecurity

1. Principles and Requirements for Biosecurity in the US, and Recommendations on Global Codes of Conduct — Barbara Johnson, DOD, US
2. Biosecurity and Bioterrorism Preparedness in Canada — Maureen Ellis, PHAC, Canada
3. The Status of International Biosecurity — Reynolds Salerno, SNL, US
4. Planning for a Successful Containment Laboratory — Maureen Ellis, PHAC, Canada

6th JBSA meeting (2006)
The Special Session for “Pathogenic Bacteria from Biosafety point of view”

1. *Bacillus anthracis*

   S. Makino, Obihiro University

2. Plague

   H. Takahashi, NIID

3. Tularemia

   O. Fujita, NIID

4. *Clostridium botulinum* toxin

   S. Ozaki, Osaka Prefecture University

1st Asia-Pacific Symposium (2006) by JBSA
- Biosafety in Asia-Pacific -

1. Current situation of Biosafety in Japan
2. Activity of ABSA
3. Activity of A-PBS
4. Current situation of Biosafety in Taiwan
5. Current situation of Biosafety in Korea
6. Strategy for Biosafety in WPRO

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1. Risk assessment for implementation of Biosafety
2. Biosafety in field collection and presumptive analysis of highly infectious pathogen samples

Regulation on the Safety Control of Laboratories handling Pathogenic Agents, NIID

1. Risk Classification of microbiological agents
2. Relation of risk groups to biosafety levels, practices and equipment
3. Facility requirements at the four biosafety levels

4. Biosafety Guidelines
   1) Risk assessment
   2) Basic laboratory BSL-1, 2
   3) Containment laboratory BSL-3
   4) The maximum containment laboratory BSL-4

*All laboratories have the own operation manual

5. Laboratory animal facilities ABSL-1 to 4
6. Guidelines for laboratory certification

Good Microbiological Techniques

① Laboratory techniques

② Emergency procedures

③ Disinfection and sterilization

④ Rules on transport of microbiological agents including other infectious substances (domestic and international)

Safety Organization and Training

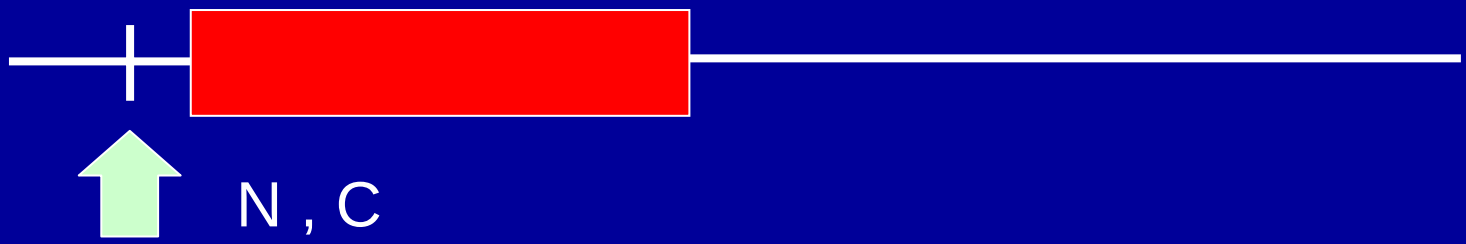
① Biosafety Office (permanent and temporary members): Responsible for all issues on biosafety and biosecurity

② Training Course : bimonthly, including English course

③ Reporting System
Material Transfer Agreement
Permission and reporting of pathogen for handling, transfer, acceptance, etc.
Reporting on accident in the laboratory
Other issues

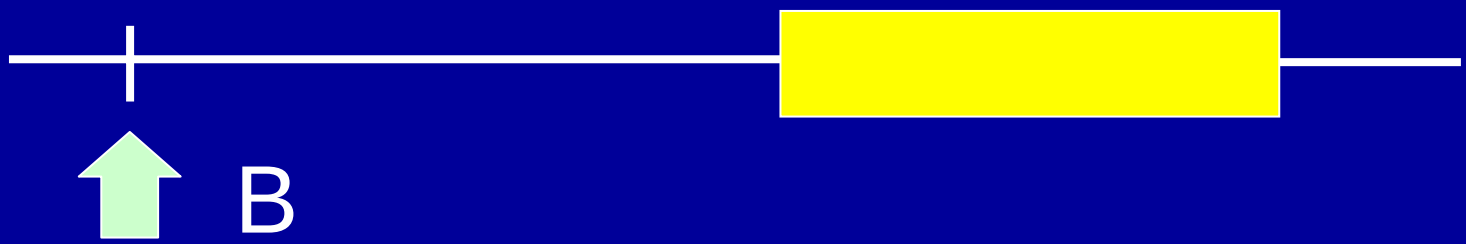
B & C　Terrorism Experiences in JAPAN

Outbreak of Disater by B/C Terrorism



N , C

Victims appear immediately after Exhalation / Bombing



B

Victims appear after certain Incubation period
(4-14 days)

Bioterrorism and Chemical Terrorism done by AUM Cult Group in 1990s

1. Biomaterials were made by only one DVM with few-years experience in a graduate school
2. Chemical materials (Sarin) were made by one chemist, who had also few-years experience in a university chemical institute

(1) AUM CULT GROUP – What They Have Done

Bioterrorism

1990. April :	Spray of Botulinum Toxin From Car Window using Electric Fan
1990. May :	Spray of Botulinum Toxin From Car Window using Electric Fan
1993. June :	Spray of Botulinum Toxin From Car Window using Electric Fan
1993. June :	Distribution of Spore (B. Anthoracis)
1993. Sep :	Distribution of Spore from Car Window at HQ. Office of Kanagawa Prefecture and at the outside area of the Emperor's Palace in the Center of Tokyo
1995. March :	Spray of Batulinum Toxin

(2) AUM CULT GROUP –What They Have Done

Chemical Terrorism

1994. June : Spray of Sarin by a motor fan through a car window (Matsumoto City)
Seven people who lived down the leeward died

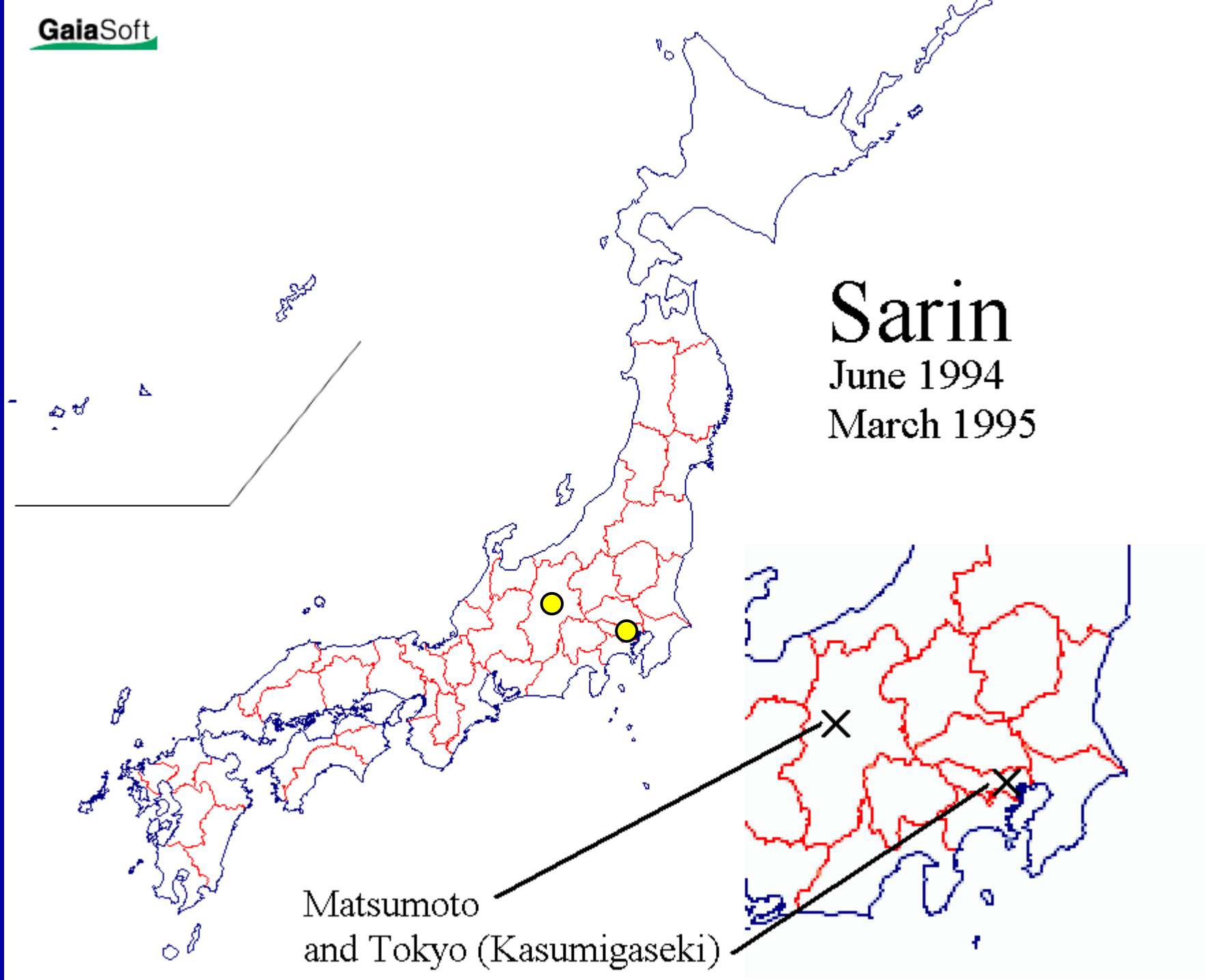
1995. March : Sarin was sprayed at the same time through staging plastic bags filled with Sarin in the subway wagons, 3 different lines, at 5 Kasumigaseki stations. HQ Area of Beurocracy, Tokyo.
Twelve People died and > 5000 injured.

Why AUM Cult Group Could Operate Terrorism

AUM is (was) one of the real cult group, which had been authorized as a religious group by the Government. Once authorized as a religion, the group is not required to pay tax, even they collect any amount of money by any means. And all their performances are recognized as religious activities, and the government even police can't has any right to control religious groups.

Nobody can touch religious activity in Japan!!

GaiaSoft


Sarin
June 1994
March 1995
Matsumoto
and Tokyo (Kasumigaseki)

Tokyo Subway Sarin Gas Attack in 1995

Fire Suppression Division,

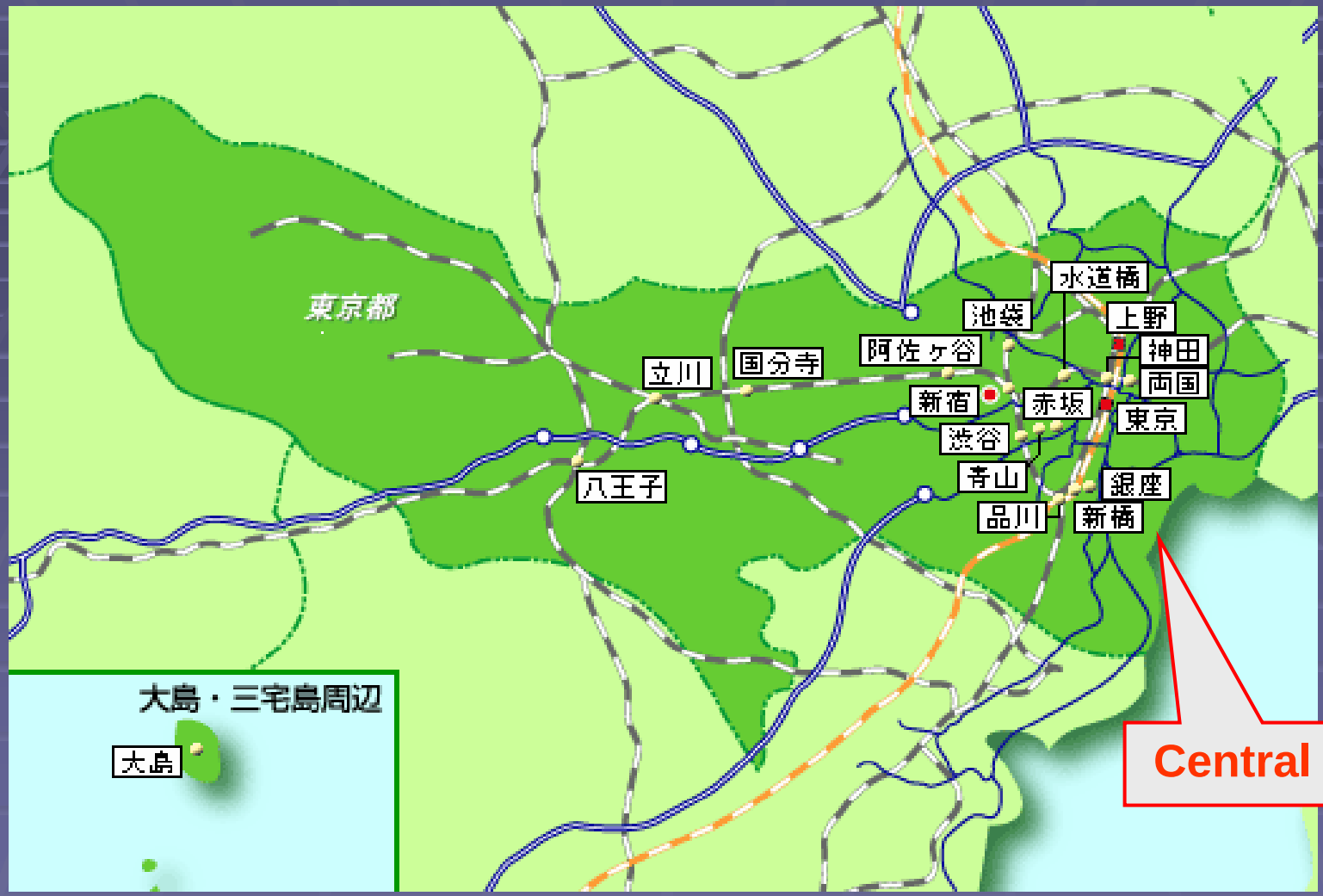
Tokyo Fire Department

東京消防庁

Tokyo Subway Sarin Gas Attack in 1995

(1) Outline of the Incident
(2) Response to the Incident
(3) Lessons Learned from the Incident

Tokyo Metropolitan Map



Area :2,187Km²

Population:12,300,000

Tokyo Fire Department

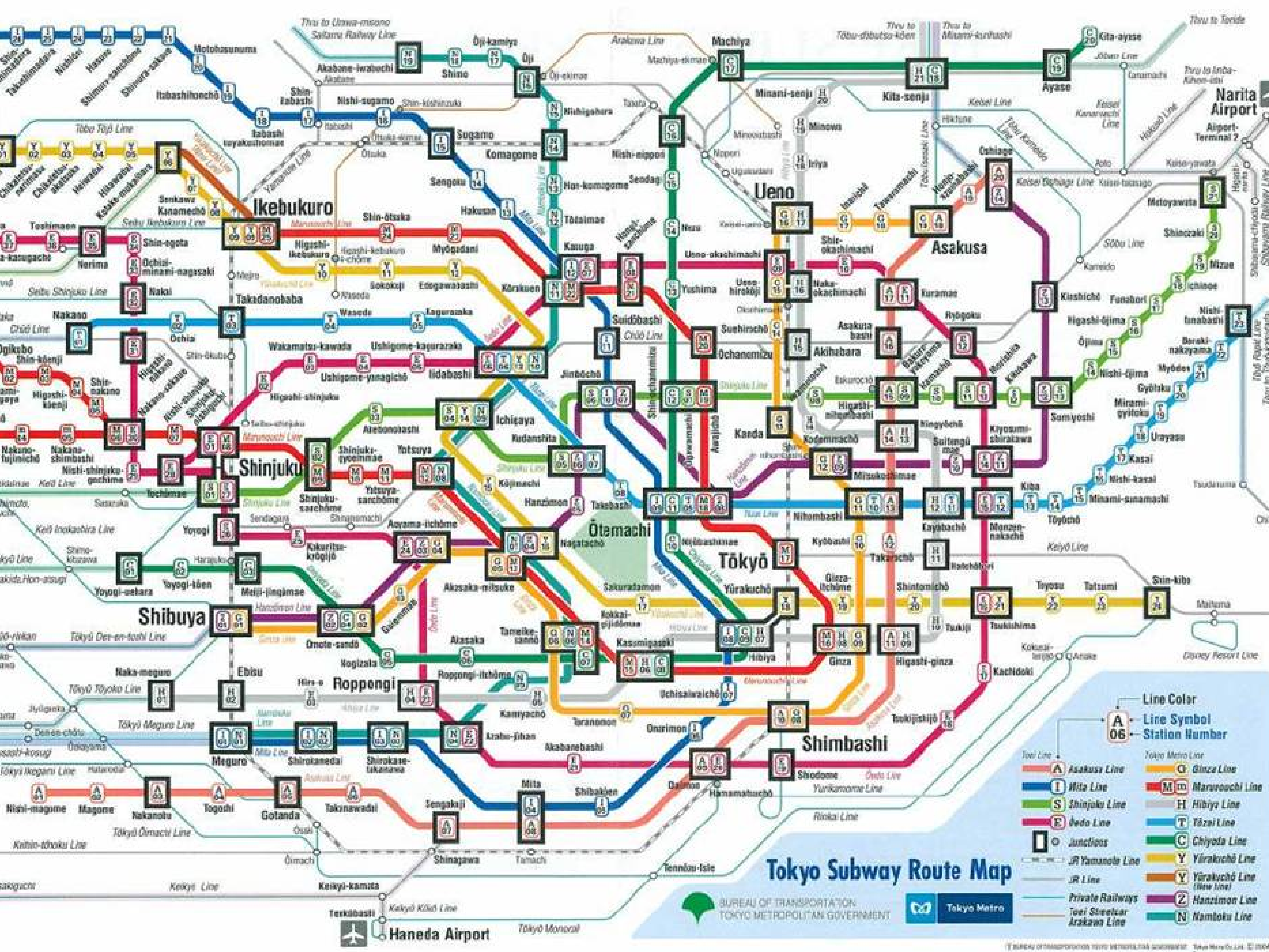
Resources

- Personnel 17,988
- Fire Station 80
- Fire Station Division 2
- Fire Station Branch 207
- Fire Apparatus 1,859

TOKYO HAZ-MAT Unit (1990 ~)

Infrared ray gas analyzer

Tokyo Subway



Tokyo Subway Route Map
BUREAU OF TRANSPORTATION TOKYO METROPOLITAN GOVERNMENT
Tokyo Metro
Line Color
Line Symbol
Station Number
Toei Line
Asakusa Line
Mita Line
Shinjuku Line
Ōedo Line
Junctions
JR Yamanote Line
JR Line
Private Railways
Toei Streetcar Arakawa Line
Tokyo Metro Line
Ginza Line
Marunouchi Line
Hibiya Line
Tōzai Line
Chiyoda Line
Yūrakuchō Line
Yūrakuchō Line (New line)
Hanzōmon Line
Namboku Line
Ikebukuro
Shinjuku
Shibuya
Ueno
Asakusa
Tōkyō
Ōtemachi
Shimbashi
Roppongi
Narita Airport
Haneda Airport
Machiya
Kita-senju
Ayase
Kita-ayase
Oshiage
Sugamo
Komagome
Kasuga
Iidabashi
Ichigaya
Yotsuya
Akasaka-mitsuke
Nagatachō
Kasumigaseki
Hibiya
Ginza
Tsukiji
Tsukishima
Shin-kiba
Meguro
Ebisu
Mita
Gotanda
Shinagawa
Akihabara
Ochanomizu
Kanda
Nihombashi
Kayabachō
Monzen-nakachō
Kiba
Tōyōchō
Nishi-kasai
Kasai
Urayasu
Nakano
Ogikubo
Takadanobaba
Kōrakuen
Shin-ōtsuka
Ryōgoku
Kinshichō
Sumiyoshi
Omote-sandō
Aoyama-itchōme
Yoyogi-uehara
Meiji-jingūmae
Nishi-magome
Magome
Daimon
Shiodome
Tameike-sannō
Kachidoki

Outline of the Subway Sarin Attack

- Known at - 8 : 09 a.m on March 20, 1995 (1st 119 call)
- Where occurred: Within the premises of the subway in Tokyo
- Method employed in the crime: To prick a bag containing sarin liquid (about 900ml) with the tip of an umbrella
- Number of death - 12
- Number of injured - 5,501

* Indiscriminate terrorist attack, using sarin gas, a deadly poison
* Occurred within the premises of the subway, a closed space
* Sarin gas was dispersed in multiple terrorist attacks

Casualties

Ikebukuro

Ogikubo

1 passenger killed

Honancho

Nakano-sakaue

Yoyogi-uehara

Naka-meguro

Kamiyacho

1 passenger killed

Kasumigaseki

2 employees killed

Kita-senju

Kodemmacho

5 passengers killed

Hatchobori

1 passenger killed

Tsukiji

2 passengers killed

Marunouchi Line

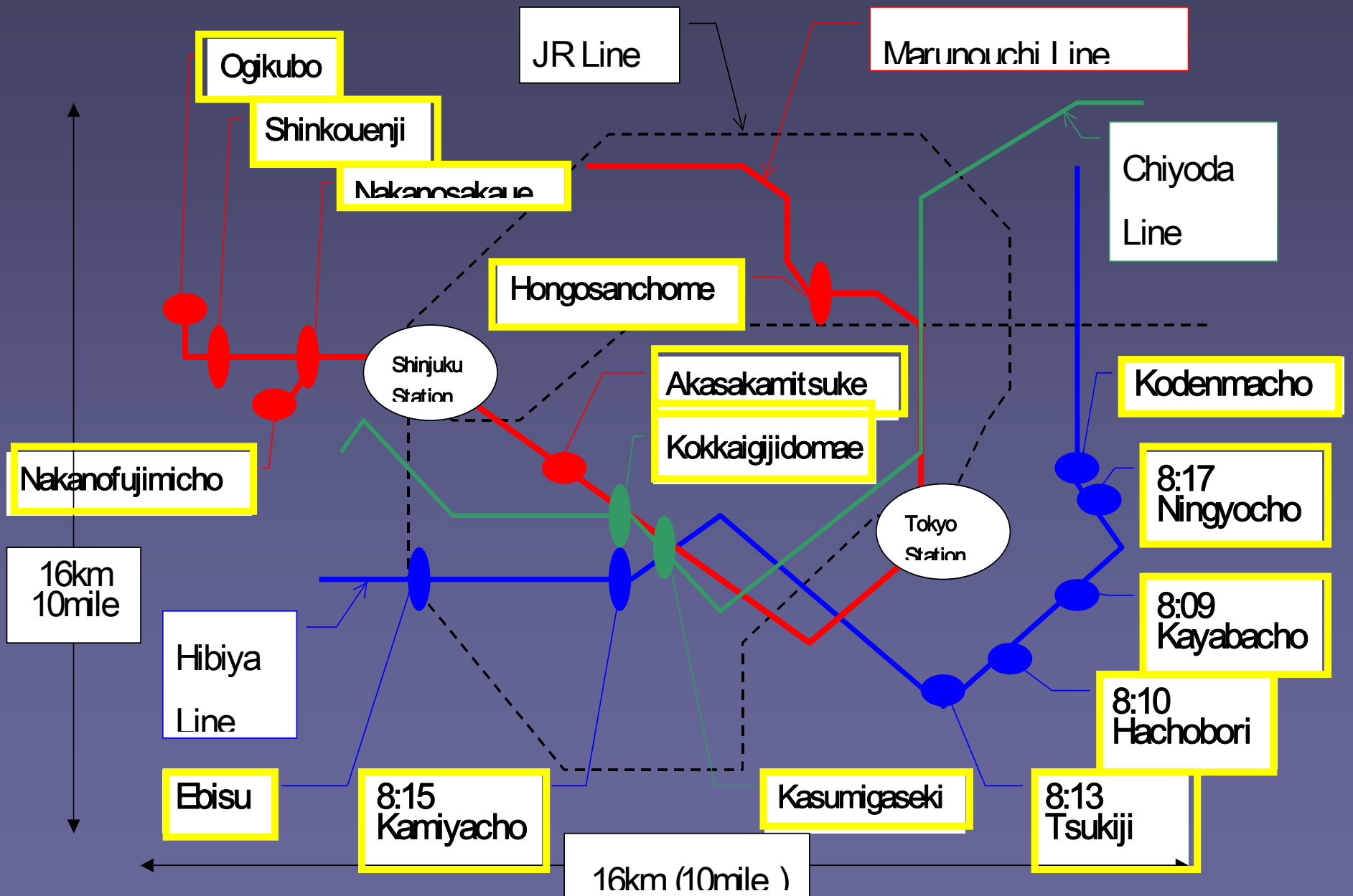
Hibiya Line

Chiyoda Line

Outline of the Actions Taken by the Tokyo Fire Department

- Units in action – 340 units in total including Haz-Mat Units, pump units and EMS Units
- Rescue and Relief of the Injured
- Analysis / Cleansing of Poisonous Gas
- Number of Transported – 688
- Number of Rescued – 692
- Number of firefighters in action – 1,364
- Number of injured firefighters - 135

Subway Stations the TFD Responded to



Actions of the Headquarters of the TFD

- The headquarters commanded fire stations where spare ambulances were made available for potential response.
- The headquarters ordered on-site fire personnel to secure the safety of themselves and prevent a secondary disaster.
- The headquarters provided information regarding chemical substances to all fire stations and on-site fire personnel.

東京・ 地下鉄サリン事件

除染による二次三次災害の防止

地下鉄サリン事件における自衛隊との連携活動

汚染車両の除染状況


日比谷線
丸ノ内線

Injury of fire personnel

- Number of firefighters in action – 1,364

- Number of injured firefighters - 135
  inside the subway station - 101
  above ground - 34

- Number of firefighters transported - 52
- Number of firefighters hospitalized - 43

Major Actions Taken on the Day of the Subway Sarin Attack (Tokyo Metropolitan Government / Japan Self Difence Forces)

【March 20th】

8:09 a.m.

8:14 a.m. nd Chiyoda

8:17 a.m.

by the telephone c

8:27 a.m.

8:30 a.m.

8:42 a.m.

8:55 a.m. ommodation of

9:00 a.m.

9:00 a.m.

Around 11:00 a.m.

als

11:17 a.m. TV news announced, “The poison is highly likely to be sarin gas.”

12:50 p.m. The Govenor of Tokyo requested the Japan Ground Self-Defence Force to dispatch anti-disaster teams.

○ Related institutions were busy taking countermeasures against the sarin attack until the night.
○ Number of people affected by the suspension of subway operations: 1,108,000 (total for three lines)

【March 21st】

1:22 a.m. Japan Ground Self-Defence Force completed the cleansing of the Kodenmacho Station.

5:00 a.m. All the subway lines started their normal traffic service from the first trains as scheduled.

Operational Lessons Learned

- Necessity to introduce reinforced detection/protection equipment against chemical agents
- Necessity for education and training for incidents involving chemical agents such as sarin gas
- Necessity to improve decontamination systems for preventing secondary contamination
- Necessity for the cooperation with related institutions such as the police/hospitals and experts


救護所
東京消防庁

Bioterrorism

B. Anthracis

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 10, No. 1, January 2004

Bacillus anthracis Incident, Kameido, Tokyo, 1993

Hiroshi Takahashi,* Paul Keim,† Arnold F. Kaufmann,‡ Christine Keys,† Kimothy L. Smith,† Kiyosu Taniguchi,* Sakae Inouye,* and Takeshi Kurata*

Figure 1. Spraying scenes from the Aum Shinrikyo headquarters building (photographs taken July 1, 1993, by the Department of Environment, Koto-ward).

Figure 2. Fluid collected from the Kameido site cultured on Petri dishes to identify potential *Bacillus anthracis* isolates.

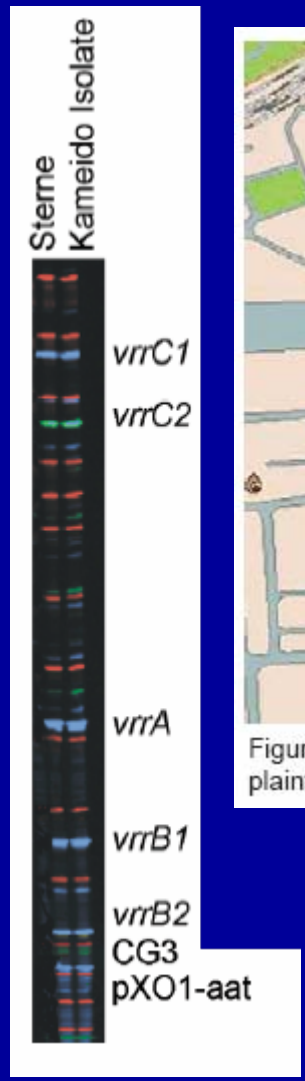


Figure 3. Multiple-locus, variable-number tandem repeat analysis genotype of all 48 Kameido isolates and the Sterne strain of *Bacillus anthracis*: *vrr*A, 313 bp; *vrr*B1, 229 bp; *vrr*B2, 162 bp; *vrr*C1, 583 bp; *vrr*C2, 532 bp; CG3, 158, bp; pX01-att, 129 bp; pX02, no amplification.

Figure 4. High-risk area for infection, based on foul odor complaints.

Complete Lack of Risk Management of Japanese Government !!

(1998, E&RE Inf. Dis. Conference, Atlanta)

In AUM cult group only one person (Ph.D.) had the experience handling viruses in some institute of a national university

This indicated bioterrorism will be caused quite easily and in any places by ordinary citizens !!

International Collaboration

1. Global Health Alert Network (MHLW)

   Global Biosecurity Action Group Net
2. Global Biosecurity Laboratory Net (NIID)
3. WHO, US CDC, Pasteur Institute, China & Korea CDC, Taiwan CDC and other foreign National Health Institutes

- NIID (MHLW) is responsible for Surveillance Activities of Infectious Diseases and NIID is responsible for Laboratory Surveillance of the Pathogens causing Infectious Diseases, in collaboration with local health laboratories and quarantine offices

Biosafety and Biosecurity (2006-2007)

Amendment of Law Concerning the Prevention of Infections and Medical Care for Patients of Infections – will be approved by Japanese National Parliament

⇨ Define for possession, use and transfer of selected biological agents

* Original law is a rather voluntary reporting based system of infectious diseases. But the purpose of the revision of the law is for prevention of bioterrorism through regulation of biological agents.

Law Concerning the Prevention of Infections and Medical Care for Patients of Infections.

Third Revision 2006

Purpose : Prevent people from the Bioterrorism through regulation of microbiological pathogens.

Regulation : Strengthen management of pathogens to secure from the following points.

① possession ② storage

③ use ④ transportation

In these items, standard has been set and contravention to the law, even facility, devices, registration of pathogens, documentation and etc, will be punished, fine or imprisonment. Even you have no distribution of pathogens intentionally !

Specified Pathogens

Dec 08, 2006

Group I	6 Genus
Group II	5 Genus + 1 Toxin
Group III	23 Genus
Group IV	15 Genus + 1 Toxin

49 Genus. 79 Strains and 2 Toxin

There is no exact correlations
on BSL-1~4 level between this law and
International classification

Legal Duty and Penalty to the Person Who Handle Pathogens

	GI	GII	GIII	GIV
The Mimiter's Assignment for Possession and Import	◎			
Permission for Possession and Import		◎		
Report for Possession and Import			◎	
Protection Rule of Infection	◎	◎		
Designation of Responsible Person	◎	◎		
Training / Education	◎	◎		
Decontamination	◎	◎		
Documentation	◎	◎	◎	
Facility (Standard)	◎/○	◎/○	○	○
Rule of Storage	○	○	○	○
Reporting of Transport	◎	◎	◎	
Reporting of Accident	◎	◎	◎	◎
Emergency Measure	◎	◎	◎	◎

Safety and Security Science and Innovation Strategy (Council for Science and Technology Policy, Cabinet Office) 2006

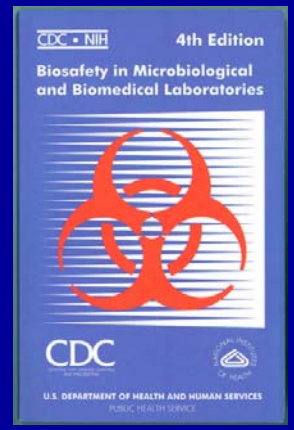
1. Security Innovation by needs for practice
2. Promotion of International collaboration – especially antiterrorism measures
3. Fostering of capable researcher and technologists for the purposes
4. Implementation of the surveillance activity
5. Development of rapid and reliable detection methods, vaccines and drugs

Code of Ethics for Misuse of Scientific Knowledge, Research and Resources (Proposed by IUMS)

The Statement on Ethics of Scientists has been Approved by the Science Council of JAPAN on October 03, 2006

To promote ethical conduct of research and training in the areas of biosecurity and biosafety so as to prevent use of microorganisms as biological weapons and therefore to protect public health and to promote world peace

Classification of Agents



Risk Group	VIRUS	BACTERIA	FUNGUS	PARACYTE
Level 1	○	○	○	○
Level 2	○	○	○	○
Level 3	○	○	○	
Level 4	○			

National (Regional) Classification of Micro-organisms by Risk Group

1. Pathogenicity of the Organisms

2. Mode of transmission and host range of the organism.
   These may be influenced by existing levels of immunity in the local population, density, presence of appropriate vectors and standards of environmental hygiene.

3. Local availability of effective preventive measures. Prophylaxis by immunization or administration of antisera, sanitary erasure, food, water hygiene, control of animal reservoirs.

4. Local availability of effective treatment. passive immunization, postexposure vaccines and use of antimicrobials, antivirals and chemo therapeutic agents,
   possibility of the emergence of drug-resistant strain.

Biosecurity Strategy on Pathogens

Law concerning anti-bioterrorism

- **USA** 2003 active
  Possession, Use, and Transfer of select Agents and Toxins

- **UK** 2001 active
  Anti-terrorism, Crime and Security Act2001
  Part7 Security of Pathogens and Toxins

Regulation on Biosafety

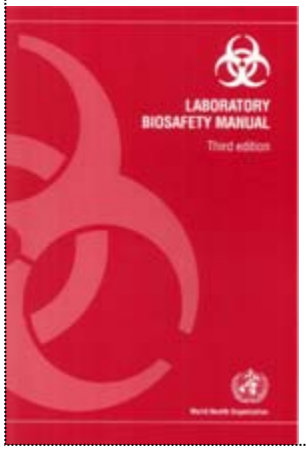
- Directive 2000/54/EC of The European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related exposure to biological agents at work
  Each country has made domestic law based on the Directive

- **China** 2004
  Prevention and therapeutic law on communicable diseases, China.

International Standard on Handling Pathogens

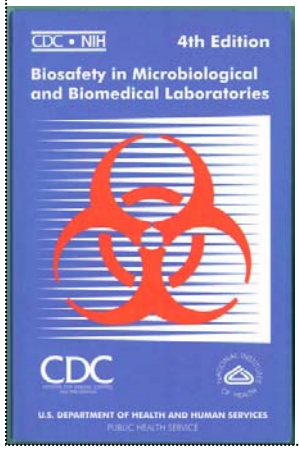
Biosafety

- **WHO**



Laboratory Biosafety Manual 3rd Edition

- **米国CDC**



Biosafety in Microbiological and Biomedical Laboratories (BMBL) 4th Edition
5th Edit on web

Biosecurity

- **WHO** ***Laboratory biosecurity (Laboratory Biosafety Manual Part II)***
  9.Labortory biosecurity concepts

  Laboratory biosecurity guidance **(** Biorisk management **)**

- **USA CDC** ***Laboratory Security and Emergency Response Guidance for Laboratories Working with Select Agents***

Japan

Law Concerning the Prevention of Infection and Medical Care for Patients of Infection (2nd revision)

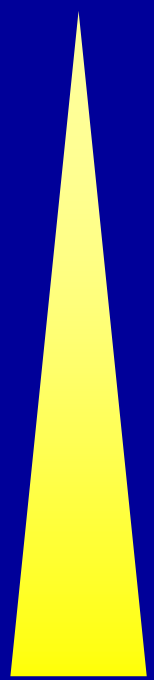
Approved at the Parliament

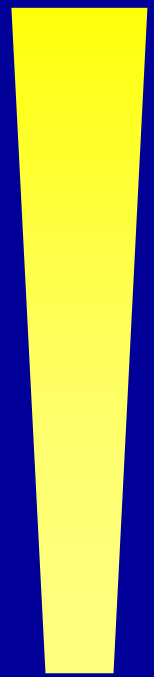
Dec. 2006

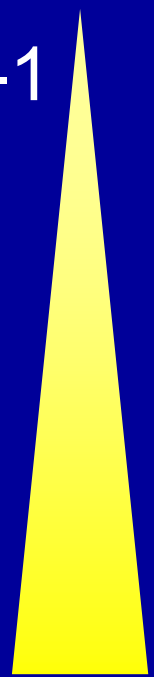
Will be active in June 2007

Discrepancy of Classification of the Pathogens

NIID	LCPIMCPI	CDC	WHO*
Level 1	Group 1	BSL-1	Risk G 1
Level 2	Group 2	2	Risk G 2
Level 3	Group 3	3	Risk G 3
Level 4	Group 4	4	Risk G 4







* WHO doesn’t specify the agent

Select Agents were classified into 4 Groups

I	Usually forbidden to possess, use, import, etc. except for diagnosis and research necessary for public health.
II	Need permission of the Minister of Health, Labour and Welfare to possess, use, import etc.
III	Report to the Minister for possession, use, import, etc.
IV	Follow the rule for storage, use, disposal, etc.

(1種 isshu)

Group 1 （ 6 ）

Forbidden: Possession, use, import, transfer, etc.

Ebola virus

Crimean Congo virus

Variola virus

Marburg virus

Lassa virus

South America hemorrhagic fever virus

（ Guanarito, Junin, Machupo, Sabia ）

例外

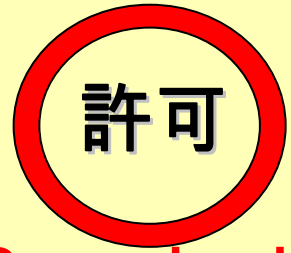
・ 国、又は政令で定める法人

・ 試験研究

厚労大臣指定

Group 2（6）

Need permission for possession and import and control of transfer



Permissio

n

- Plague
- SARS Corona virus
- Anthrax
- Tularemia
- Botulinus
- Botulinus toxin

許可基準

・検査、治療、　医薬品

　等の製造、試験研究

厚労大臣の許可

Group 3 （21）

Need report of possession, import, transfer

Report

- Q fever Coxiella
- Rabies virus
- MDR MTb
- Coccidioides immitis
- Monkey pox
- HFRS
- Nipha virus
- Brucellosis
- B virus
- Burkholderia mallei, pseudomallei
- Venezuelan, Eastern and Western Equine Encephalitis
- Rocky Mountain spotted fever, Typhoid fever, Spotted fever japonica rickettsia
- Tick-borne Encephalitis and hemorrhagic fever virus
- Hendra virus
- Rift valley fever virus
- HPS virus

Group 4 （16）

遵守

Follow the handling rule

Westnile fever virus

H2N2 influenza virus

Yellow fever virus

Chlamydia psittaci

Cryptosporidium

Cholera

Mico. tuberculosis, excluding MDR-MTb

Polio virus

Shigella

Typhus-Palatyphus

Enterohemorrhagic E coli.

Dengue virus

Avian influenza virus

Japanese encephalitis virus

Shiga toxin

What We Need Now ?

- Emerging & Re-Emerging Infectious Diseases
- Biodefence

Strengthen the Active Surveillance

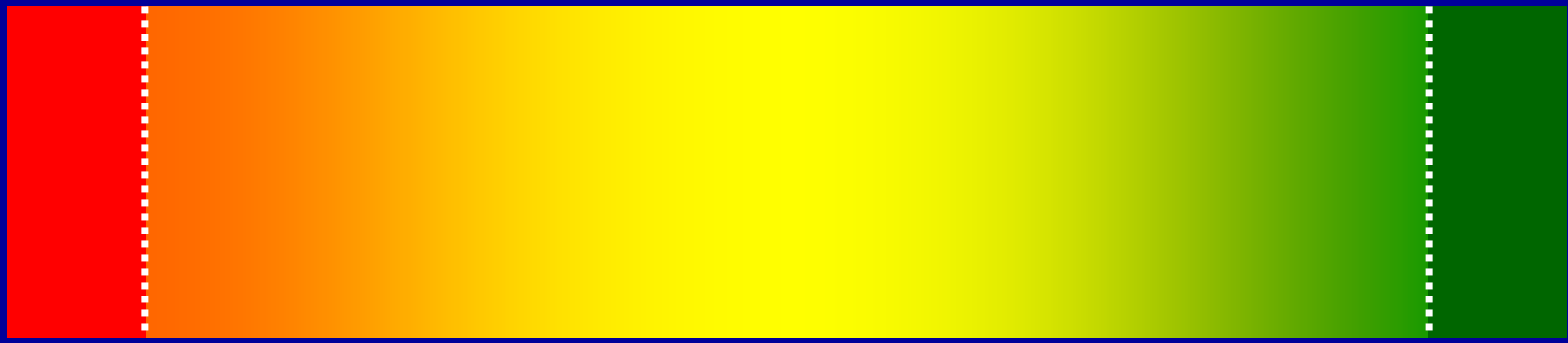
Promotion of Basic Research of Pathogens Including Genetic Analysis

Enhancement of the Basis of Infrastructure Preparation (Facility, Devices, Personnel, Training, Information Network – Domestic & International)

Technical Development

① Vaccine for Prevention
② Diagnosis Technology
③ Drug / Therapy

Safety and Security



危険 Danger　　リスク Risk　　安全 Safe

高い
High

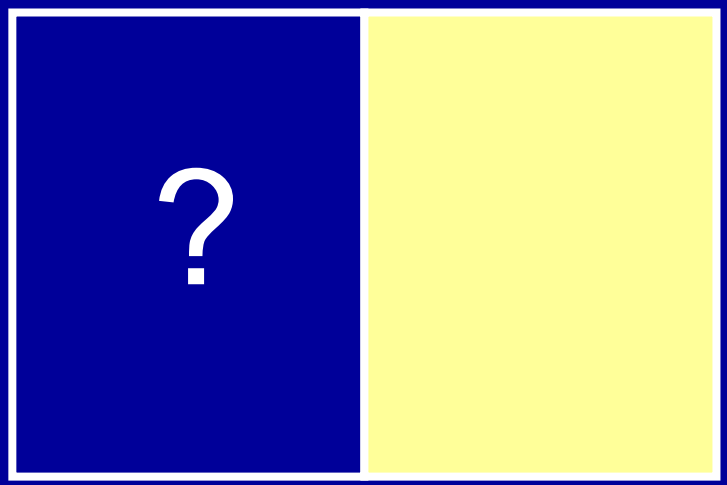
低い
Low

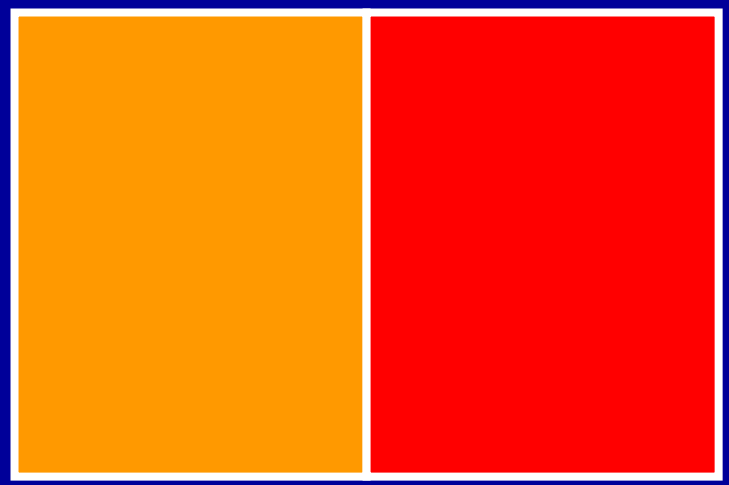
- 危険性(Danger) → 安全性（Safety）
  former use　　Present use
- バイオハザード対策 → バイオセーフティー
  Biohazard Measure（old usage）　　Biosafety（current）

リスク
Risk

と

危険
Danger





Acknowledgement

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月下美人

Thank you for
your attention!

ご静聴ありがとうございまし

ご協力いただいた
国立感染症研究所
感染病理部の皆様、
厚生労働省中山様
富山衛研東山様に
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