National disease surveillance arrangements & experiences in providing assistance for capacity-building

Infectious Disease Surveillance Center
National Institute of Infectious Diseases
Ministry of Health, Labour and Welfare
Ministry of Foreign Affairs
JAPAN
Routine surveillance
Laws Concerning Infectious Disease Surveillance

- Infectious Disease Control Law (Law Concerning the Prevention of Infectious Diseases and Medical Care for Patients of Infections)
  - enacted in April 1999, abrogating the Communicable Disease Prevention Law, the Venereal Disease Prevention Law and the AIDS Prevention Law, and amended in November 2003
  - Revised in 2008 May, Creating new category “Pandemic influenza and relevant infection.”

- Food Sanitation Law
  - enacted in 1948
  - Covering food poisonings
National Organizational Structure

In case of infectious disease control

Ministry of Health, Labour and Welfare
National Institute of Infectious Diseases

Local government
47 prefectures and 80 ordinance-designated cities

Health Care Center (576)
Local PHI (74)

Designated hospitals for specific infectious diseases
Collaborating hospitals
Surveillance System in Japan

- **Notifiable diseases**
  - All clinics / hosp.

- **Sentinel-Reporting diseases**
  - Sentinel clinics / hosp.
  - Clinical isolates and specimens

- **Case Report**

- **Summary Report (wk/mo)**

**Health centers**

- **Pref. Health Depts.**
- **Pref. IDSCs**
- **Pref. PHIs**

**MHLW**

**National IDSC (NIID)**

**Laboratories (NIID)**

- **Quarantine stations**

**Information dissemination**

- Reports
- Specimens
- Computer network
- Patient (data entry by HCs)
- Infectious agent (data entry by PHIs)
Surveillance under the Infectious Disease Control Law

- **Patient Surveillance**
  - Notifiable diseases: Category I-V
  - Sentinel-reporting diseases (Category V)
  - Sentinel-reporting syndromic surveillance (2 syndromes)

- **Infectious Agent Surveillance**
  - Almost of notifiable disease cases (65 diseases)
  - Most of sentinel-reporting disease cases (23 diseases)

- **Seroepidemiological surveillance for VPD**

- **Animal-case Surveillance in veterinary practitioners**
  - Notifiable diseases and the target animals (8 diseases of Category I-V)
# Notifiable Diseases (reporting)

<table>
<thead>
<tr>
<th>Cat.</th>
<th>Diseases</th>
<th>Time of reporting</th>
<th>Asymptomatic cases</th>
<th>Suspected cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Ebola hemorrhagic fever, Plague, Smallpox, etc.</td>
<td>Immediate</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>II</td>
<td>Pandemic Influenza</td>
<td>Immediate</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>III</td>
<td>Diphtheria, Polio, SARS, Tuberculosis, H5N1 infection</td>
<td>Immediate</td>
<td>Yes</td>
<td>Yes, but except diphtheria, polio</td>
</tr>
<tr>
<td>III</td>
<td>Cholera, Typhoid fever, EHEC infection etc.</td>
<td>Immediate</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>IV</td>
<td>Hepatitis A, Malaria, Dengue fever, Rabies etc.</td>
<td>Immediate</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>V</td>
<td>HIV/AIDS, Amebiasis, VRE infection, etc</td>
<td>Within 7 days</td>
<td>Only for HIV &amp; syphilis</td>
<td>No</td>
</tr>
</tbody>
</table>
Notifiable Diseases, Category I (7 diseases)

- Crimean-Congo hemorrhagic fever, Ebola hemorrhagic fever, Lassa fever, Marburg disease, Plague, Smallpox, South american hemorrhagic fever

- Single case causes severe health impact
- Extremely High case fatality rate AND Human to human transmission
- Confirmed cases, Suspected cases, Asymptomatic cases
- Time of reporting: immediately
- Hospitalization: Class I Hospital
Notifiable Diseases, Category II (4 diseases)

- Diphtheria, Poliomyelitis, Severe acute respiratory syndrome (SARS), Tuberculosis

- Epidemic prone diseases which could occur through droplet or air-borne transmission
- Human to human transmission, high case fatality rate, and public health impact
- Confirmed cases, Suspected cases (※), Asymptomatic cases
  ※: except Diphtheria and Poliomyelitis
- Time of reporting: immediately
- Hospitalization: if necessary (if symptomatic), Class II Hospital
**Notifiable Diseases, Category III (5 disease)**

- Cholera, Enterohemorrhagic *Escherichia coli* infection, Paratyphoid fever, Shigellosis, Typhoid fever

- **Epidemic prone diseases**
- **Require enteric precautions**
- Confirmed cases, Asymptomatic cases
- Time of reporting: immediately
- Hospitalization: If necessary, ordinary hospital
Notifiable Diseases, Category IV (41 diseases)

Anthrax, Avian influenza virus infection, Botulism, Brucellosis, B-virus infection, Coccidioidomycosis, Dengue fever, Eastern equine encephalitis, Echinococciosis, Epidemic louse-borne typhus fever, Glanders, Hantavirus pulmonary syndrome, Hemorrhagic fever with renal syndrome, Hepatitis A, Hepatitis E, Japanese encephalitis, Japanese spotted fever, Kyasanur Forest disease, Legionellosis, Leptospirosis, Lyme disease, Lyssa virus infection (excluding rabies), Malaria, Melioidosis, Monkeypox, Nipah virus infection, Omsk hemorrhagic fever, Psittacosis, Q fever, Rabies, Relapsing fever, Rift Valley fever, Rocky Mountain spotted fever, Scrub typhus, Tick-borne encephalitis, Tularemia, Venezuelan equine encephalitis, Hendra viral disease, West Nile fever (including West Nile encephalitis), Western equine encephalitis, Yellow fever

- Zoonotic diseases with relative low incidence
- need detection of cluster
- Confirmed cases, Asymptomatic cases
- Time of reporting: immediately
- Hospitalization: If necessary, ordinary hospital
Notifiable Diseases, Category V (14 diseases)

Acquired immunodeficiency syndrome, Acute encephalitis (including encephalopathy), Amebiasis, Congenital rubella syndrome, Creutzfeldt-Jakob disease, Cryptosporidiosis, Giardiasis, Meningococcal meningitis, Severe invasive streptococcal infection, Syphilis, Tetanus, VCM-resistant *Enterococcus* infection, VCM-resistant *Staphylococcus aureus* infection, Viral hepatitis (excluding hepatitis A and E)

No immediate action required, but require monitoring incidence for long-term measure

- Confirmed cases
- Time of reporting: Within 7 days
- Hospitalization: If necessary, ordinary hospital
## Notification of Animal Infections by Veterinarians

<table>
<thead>
<tr>
<th>Infectious agent of</th>
<th>Target animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebola hemorrhagic fever</td>
<td>Monkey</td>
</tr>
<tr>
<td>Marburg disease</td>
<td>Monkey</td>
</tr>
<tr>
<td>Plague</td>
<td>Prairie dog</td>
</tr>
<tr>
<td>Severe acute respiratory syndrome</td>
<td>Chinese ferret badger, raccoon dog, masked palm civet cat</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>Monkey</td>
</tr>
<tr>
<td>West Nile fever</td>
<td>Bird</td>
</tr>
<tr>
<td>Echinococciosis</td>
<td>Dog</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Monkey</td>
</tr>
<tr>
<td>Avian Influenza (H5N1)</td>
<td>Bird</td>
</tr>
</tbody>
</table>
Sentinel Surveillance for category Vb

- For the common diseases to watch disease trends
- First established as voluntary network of paediatricians, 1981
- Employed by the government as national system, 1987
- Strengthened in the infectious disease control law, 1999
- Randomly selected sentinels
  - Number of sentinels per HC cover area determined in order to estimate annual incidence rate within 5% of standard error rate
  - 5,000 for Influenza (weekly)
  - 3,000 for pediatric infectious diseases (weekly)
  - 600 for ophthalmologic diseases (weekly)
  - 900 for STD (monthly)
  - 500 for encephalitis (weekly), drug resistant bacteria infection (monthly)
- Weekly or monthly patients number by age group and sex (STD)
- Based on clinical case definition
- Weekly reported number per sentinel as index of activity on PHC area, prefecture and national level
- Statistical estimation of annual incidence
Strategy for early detection

- Event-based surveillance
- Syndromic surveillance
- Outbreak surveillance
- Suspected case surveillance
- Routine morbidity and mortality surveillance
Syndromic surveillance trial using existing electronic data

- Data collection
- Real-time analysis
- Statistical algorithm
- Data transfer
- Feedback
- Situation in the OPD
- Situation in the ward
- Situation in the community

Automation
Automated syndromic surveillance system using electronic chart

S診療所

電子カルテの主訴、所見

診療所検索*できる機能を

検索

発熱、呼吸器症状、下痢、嘔吐、発疹

否定語処理

患者数件数

（年齢・性別のみ）集計

症状を呈する患者数を日々観察

統計学的解析アルゴリズム

解析結果

感染症流行警報（アラート）

SSL

VPN

リアルタイム症候群サーベイランス

「発症検知」画面（インターネットサーバ）

「出荷での流行確認」画面

「地域的流行の推移」画面

National Institute of Infectious Diseases
Infectious Disease Surveillance Center

DSC
Infectious Disease Surveillance Center
リアルタイム症候群サーベイランス
「流行探知」還元画面（インターネットサーバ）

「当院での流行探知」

「地域的流行の探知」
地域的流行の探知

嘔吐における地域的流行の探知【6ヶ月】

参加医療機関（出雲地域）：6 医療機関

Community alert!!
Ambulance call surveillance

<Tokyo metropolitan ambulance>

Routine work
- records
- analysis
- detection

Graphical presentation
### Web-based School absenteesm surveillance

#### AAA小学校

OSVダウンロード：ダウンロード

<table>
<thead>
<tr>
<th>年</th>
<th>クラス</th>
<th>欠席者数</th>
<th>眠り</th>
<th>呼吸器症状（かぜ含む）</th>
<th>下痢</th>
<th>嘔吐</th>
<th>発熱</th>
<th>インフルエンザ様症状</th>
<th>学級関係</th>
<th>アラート</th>
</tr>
</thead>
<tbody>
<tr>
<td>1年</td>
<td>1組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>9人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>1年</td>
<td>2組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>1年</td>
<td>3組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>1年</td>
<td>学年計</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>2年</td>
<td>1組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>2人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>2年</td>
<td>2組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>2年</td>
<td>学年計</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>2人</td>
<td></td>
<td>☐</td>
</tr>
<tr>
<td>3年</td>
<td>1組</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td>0人</td>
<td></td>
<td>☐</td>
</tr>
</tbody>
</table>
Integration of surveillance

- Data entry at school
- Absenteeism data
  - Historical data
  - Statistical analysis
  - Daily feedback

Ambulance surveillance

Syndromic surveillance
International surveillance

- Web-based news media surveillance (Biocaster)
- Japanese embassy system network
  - Rumour surveillance from local association of Japanese residents overseas
  - Local media surveillance
  - Official enquiry through diplomatic channel
BioCaster system overview

Analysis tools
- Source Preprocessing
- Entity Analysis
- Topic Classification
- Grounding
- Event extraction
- Relevancy ranking
- Translation

Content and metadata storage
- Database
- Document links
- Annotations
- Ontology Rules
- Markup (XML)
- Knowledge objects

User services
- Event alert
- Global health monitor

Ontology viewer

Trends analyser

Dr. Nigel Collier, NII, Japan
BioCaster Public Health Ontology

More than 6800 term variants in 8 languages

Chinese
English
French
Japanese
Korean
Spanish
Thai
Vietnamese

Plus World geographic locations

Nigel Collier1, Ai Kawazoe2, Lihua Jin2, Mika Shigematsu1, Kiyosu Taniguchi2, Dinh Drien3, Robert Barer0n4, Koichi Takeuchi5, Asanee Kawtrakul6, Hutchatai Chakleka1, John McCrae7, Ngo Quoc Hung1, Asao Fujiiama1, Yoshio Tateno7

1 National Institute of Informatics, Japan
2 National Institute of Infectious Diseases, Japan
3 Vietnam National University, Vietnam
4 University of Western Australia, Australia
5 Okayama University, Japan
6 Kasetsart University, Thailand
7 National Institute of Genetics, Japan

113 infectious diseases
7 syndromes
10 transmission modes
83 organisms
107 micro-organisms
144 symptoms

Reference

Acknowledgement
We gratefully acknowledge funding by the Transdisciplinary Integration Center at ROIS (http://rois.ac.jp/tric/)
"Find me news articles published in the last week about cases of hemorrhagic fever related diseases in DR Congo published in press news reports or blogs which I have not yet judged."
Global Health Monitor

[Map of global health monitor with information on outbreaks and cases.]

Dr. Nigel Collier, NII, Japan
Experience of unusual event

Chinese News media report
18 JULY 2008

- According to a national source, Shandon Province's Qingdao Municipal Hospital, the Affiliated Hospital of Medical College Qingdao University, and other major hospitals within the area have all seen a major increase in meningitis patients with influenza-like symptoms starting in July.
- Many patients reportedly present with headaches, vomiting, and persisting fever, while the symptoms among children and the elderly are more severe.
- As of 15 July, 160,000 people have reportedly been affected "over several days" in the Qingdao area, and the casualty count is reportedly 1,251.
- Citizens are reportedly anxious about the spread of the disease.
- Initially, the Qingdao Public Health Bureau reportedly stated that the disease was influenza and that there were no concerns for the wide spread of the disease, but citizens in the area were reportedly wondering whether this was another, unidentified, disease. However, the source also reports that the Bureau eventually determined the disease to be meningococcal meningitis.
- In an effort to prevent panic for the upcoming Olympics sailing events, the Bureau reportedly plans to suppress disease information and institute quarantine measures for existing patients.
Domestic case report

- 56 y.o businessman working at Shanghai
- frequently visiting Qingdao city
- 8 July onset with fever, malaise, breathing difficulty
- consulted to the hospital in Shanghai
- 9 July returned to Japan
- Fever persisting and consciousness deterioration, finally shock state
- Diagnosed as Meningoencephalitis and atelectasis of bilateral lung
- Consulted to NIID because of news media report
- virological investigation started
- More information in Qingdao will be necessary
Response

- Informal consultation to WHO/HQ/ARO
  - No relevant information
- Personal communication with CDC/GDD
  - Only media report without any verified outbreak in Qingdao city
- Continuing media search
  - No more media information
- Japanese Embassy system
  - Diplomatic route get an official reply from Chinese authority saying that nothing unusual
  - Japanese association of residents in Shanghai reports no unusual events in Shanghai and Qingdao
- Informal consultation to WPRO/CDR
  - Continuing entero71 infection in the community and reporting rate also increased by government order
MLHW and NIID: International and domestic Network

Network in
- Research Laboratory of Public Health
- Health Center
- Quarantine

Related Government Ministries
- Ministry of Education, Culture, Sports, Science and Technology
- Agriculture, Forestry and Fisheries Ministry
- Ministry of Environment, Etc.

Universities and Research Institutes

NIID
- Research
  - Surveillance of infectious diseases in Japan
  - Basic Applied Research of microbiological pathogens
  - Cooperation with International organization
  - Study for diagnosis technique and vaccine.
- Providing Research Results
  - Publishing weekly report (IDWR)
  - Publishing monthly report (IASR) etc.

MLHW
- Basic Research Institute
  - Basic research
    - International medical centre of Japan
    - Clinical Study
    - The research Institute of Tuberculosis
    - Japan Anti Tuberculosis Association
    - Study and Research for Tuberculosis

Global Relations
- CDC, Taiwan
- CDC, China
- HPA, UK
- Pasteur, France
- AU Public Health
- DHAC, Australia
- NIH/CDC, Korea
- NIH/CDC, Thai
- Health, Canada
- Ministry of Health, Vietnam
- JICA
NIID bi-lateral cooperation in Asia

Country
(No. of Scientists from NIID : from country)
- cases of collaboration agendas
- collaborating institutes
- Memorandum etc.

Country
(Taiwan (6/11))
- Taiwan CDC, Taipei Univ.
- Memorandum (TCDC) 2004

China (38/105)
- 14
- C-CDC, C-Academy
- Memorandum (CCDC) 2006
- JICA Project

Korea (15/2)
- 6
- K-CDC, Yonsei University
- Memorandum (KCDC) 2006

Taiwan (6/11)
- Taiwan CDC, Taipei Univ.
- Memorandum (TCDC) 2004

China (38/105)
- 14
- C-CDC, C-Academy
- Memorandum (CCDC) 2006
- JICA Project

Korea (15/2)
- 6
- K-CDC, Yonsei University
- Memorandum (KCDC) 2006

Taiwan (6/11)
- Taiwan CDC, Taipei Univ.
- Memorandum (TCDC) 2004

Taiwan (6/11)
- Taiwan CDC, Taipei Univ.
- Memorandum (TCDC) 2004

Country
(Afghanistan (0/1))
- Pakistan (1/5)
  - Pakistan NIH
  - JICA

Pakistan (1/5)
- Pakistan NIH
- JICA

Bangladesh (2/3)
- 2
- ICDDR

Bangladesh (2/3)
- 2
- ICDDR

India (4/3)
- 1
- ICGEP

India (4/3)
- 1
- ICGEP

Myanmar (4/11)
- 2
- Myanmar NIH

Myanmar (4/11)
- 2
- Myanmar NIH

Laos (3/4)
- 2
- NIPH

Laos (3/4)
- 2
- NIPH

Malaysia (2/2)
- 4
- University of Malaya, Sarawak University

Malaysia (2/2)
- 4
- University of Malaya, Sarawak University

Mongolia (0/6)
- 5
- Mongolia CDC, PHI

Mongolia (0/6)
- 5
- Mongolia CDC, PHI

Thailand (10/10)
- 15
- Thailand NIH

Thailand (10/10)
- 15
- Thailand NIH

Cambodia (6/3)
- 4
- NIPH

Cambodia (6/3)
- 4
- NIPH

Vietnam (28/27)
- 8
- NIHE, Inst. Pasteur
- Memorandum (NIHE) 2008
- JICA Project

Vietnam (28/27)
- 8
- NIHE, Inst. Pasteur
- Memorandum (NIHE) 2008
- JICA Project

Philippine (11/11)
- 4
- Inst. Tropical Medicine

Philippine (11/11)
- 4
- Inst. Tropical Medicine

Indonesia (15/16)
- 1
- NIHRD
- Memorandum (NIHRD) 2007
- JICA Project

Indonesia (15/16)
- 1
- NIHRD
- Memorandum (NIHRD) 2007
- JICA Project

No. of Scientist from NIID & Country : 2006
1. Collaboration with WHO

Attending to the WHO network for surveillance and pathogen diagnostic activities.

Dispatching experts to the WHO mission (2006)
(No. of Experts HQ: 22, WPRO: 6, other 13 nations: 28)

Example for WHO network NIID are attending

2. Pathogen safety handling : Global Biosafety Laboratory Net
3. Others
   1) Influenza : WHO Global Influenza Program Influenza Collaboration Center, Flu Net
   2) SARS : SARS Laboratory Net, WPRO SARS Reference Laboratory
   3) Polio : WHO Polio Eradication Program Reference Laboratory
   4) Entero virus : WHO Enterovirus Center
   5) Measles : WHO Measles Special Laboratory
   6) Intestinal infectious diseases : ECDC Entero Net

4. Members in WHO experts committees
   ① SARS Global Expert Committee
   ② Polio Eradication program
   ③ Pandemic Influenza experts meeting
   ④ Biosafety Advisory Group
   ⑤ Other workshops and so on.

2. Technical support for Asian countries

- Polio (Workshop for lab diagnosis, Molecular epidemiology for vaccine delivered virus in China and Cambodia)
- Entero virus (WPRO lab Network)
- Influenza H5N1 (Lab training for Vietnam, Indonesia, Burma, Mongolia)

3. Attending to Infectious disease Network in Asia

- TEPHINET (collaboration with China, Korea, Thailand, Indonesia, Philippines)
- PuuseNet Asia Pacific (14 countries among Panpacific and Asia)
- ASEAN+3 Lab Epidemiology meetings

4. Collaborative Scientific Research in Asia

- Hepatitis E Virus (Molecular epidemiology in 5 countries)
- HB genotype study (in Vietnam and etc.)
- Human Herpes Virus type 8 (Serum survey in Thailand)
- Research of biological products quality control (China, Thailand, Korea, Vietnam, others)
Cooperation with national center in overseas

“Memorandum of Collaboration on Infectious Diseases Between NIID and national center in Asian countries such as Korea, Vietnam, Indonesia, China ” has been made.

The purpose of the Memorandum is to specify the cooperation including the exchange of human and technical resources between the two institutes.

NIID and overseas national center will make mutual support and cooperation on each of the following items.

(1) **Collaborative research on infectious diseases**
(2) **Development and training of human resources**
(3) **Sharing information regarding infectious diseases**
(4) **Other matters regarding infectious diseases control and the development of the two institutes**
The 1st Forum of China-Japan-Korea on Communicable Disease Control and Prevention
22-23 November, 2007 Beijing
Experiences in providing assistance for capacity-building

- Technical support combined with Japanese International Cooperation Agency
  - P3 laboratory and biosafety/security capacity building with Vietnam
  - Strengthening Avian influenza surveillance program with South Sulawesi, Indonesia
- Technical assistance among ASEAN+3
Support of building for BSL-3 laboratory and biosafety system with NIHE, Viet Num

- Construction of BSL-3 laboratory by Japanese ODA
  - 3 BSL3 labs and 1 ABSL3 lab in New Building
- Maintenance of BSL-3 laboratory supported by JICA
  - Operation manual and maintenance procedure
- Capacity for biosafety supported by JICA
  - Biosafety policy and regulation (Regulation on Biosafety at NIHE)
  - Training and Training manual (SOPs)
  - Registration system for dangerous pathogens (SOPs)
  - Technical protocol (SOPs)
Supporting strengthening Avian influenza surveillance with South Sulawesi province, Indonesia

- Assessment of current surveillance system
- Revitalization of routine surveillance
  - Lecture and Training
  - Revision of surveillance protocol
- Enhancing Avian influenza surveillance
- Early warning system setting-up
- Supporting FETP
ASEAN+3 Lab·Epidemiology meetings

Harmonized the ASEAN+3 three existing projects on strengthen regional capacity to the challenges of emerging and resurging infectious diseases in this region.

Jakarta, Indonesia (29th July – 1st August 2003)

- ASEAN Disease Surveillance Net
- Strengthening Epidemiological surveillance for EID among ASEAN+3 countries
- Strengthening Laboratory Capacity and Quality Assurance for Infectious Disease Surveillance among ASEAN+3 Countries
• Lab staff training for diagnosis of H5N1 avian influenza at NIID (2004-2008).

• Countries of invited staff:
  Taiwan, Indonesia, Viet Nam, China, Mongolia, Lao, Korea, Singapore, Cambodia, Myanmar.
Laboratory Training for Diagnosis of Pandemic H1N1v, September 1-2, 2009, NIID, Tokyo, Japan

- Participants
  - BRUNEI DARUSSALAM, CAMBODIA, INDONESIA, LAO PDR, MALAYSIA, MYANMAR, PHILIPPINES, SINGAPORE, THAILAND, VIETNAM

- Lecture session
- Wet laboratory training