"Surveillance and capacity building in South-East Asia: SISEA project"

**International Pasteur Institutes Network**

1. What is SISEA?
2. Main SISEA’s outcomes
   - Improving surveillance through a better knowledge of some EIDs: ARI & AES
   - Capacity strengthening
     - Equipment, consumables
     - Human resources
     - Public health capacities: detection/response of potentially at risk outbreaks
3. Conclusions & perspectives

**Context:**
- Outbreak as global social crisis in South-East Asia: SARS (2003-2004, 8096 cases/774 fatalities); avian influenza (2005 and sqq.; 467 cases/282 fatalities on Dec. 31st 2009)
- International concern and mobilization as soon as northern countries felt themselves in danger (what will be called by WHO from 2005: “PHEIC” included in the IHR-2005)
- And the beginning of an international involvement and commitments from multilateral and bilateral institutions

**Budget breakdown – in line with the objectives**

<table>
<thead>
<tr>
<th>Type of disbursement</th>
<th>Amount (€)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>720,936</td>
<td>12</td>
</tr>
<tr>
<td>Personnel &amp; Training</td>
<td>2,215,543</td>
<td>38</td>
</tr>
<tr>
<td>Goods and services</td>
<td>2,028,234</td>
<td>34</td>
</tr>
<tr>
<td>Monitoring and evaluation</td>
<td>181,787</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>369,300</td>
<td>6</td>
</tr>
<tr>
<td>Management fees</td>
<td>384,000</td>
<td>7</td>
</tr>
</tbody>
</table>
Objectives and content of the SISEA project:
The aim of SISEA project is to contribute to improving the
detection and the treatment of epidemic episodes in South-East
Asia
The specific objectives of the SISEA project aim to:
►Establish a program for epidemiological surveillance and
investigation of epidemics caused by emerging viruses
►Establish a network of laboratories and develop regional
coordination in these fields in association of WHO

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1. What is SISEA?
2. Main SISEA’s outcomes
   a. Improving surveillance through a better
      knowledge of some EIDs: ARI&AES
5. Technology transfer
   • Equipment, consumables
   • HR
   • Network integration and partnerships
3. Conceived perspectives

Network of laboratories & hospital-based sentinel sites

Here are the nodes, and finally, the project
aims at building the edges, so as it
becomes a real network
Improving surveillance in Cambodia - 1 (Vong & al.):
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Improving surveillance in Vietnam (SARI and AES) IP-Nha Trang:

- Implementation of the AES surveillance activities in April 2007 - Nov 2008
- 31777 patients enrolled. In depth clinical classification and data validation (Ph. Mapual & al.)
- Activities implemented in 2009 (cumulative number of SARI cases>2000):
  - Investigation of an outbreak of coronavirus NL-63 detected at the communal level thanks to the multiplex protocols implemented at NIHE through SISEA.
  - Publication of the first data on encephalitis in a National Medical Journal (Health Messenger)
  - Use of SISEA results, national epi-reports to network for changing AES recommendations on first line treatment for ARI (high resistance of S. pneumonia to ampicillin and cotrimoxazole)

And also, as a main outcome: improving patient care management
- Follow-up of clinical process indicators:
  - Monitoring of the number of discrepancies and incoherence in SISEA CRF
  - Thru ascertainment of diagnosis
  - Thru monitoring of a sample of patients after discharge

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Improving surveillance in Vietnam (SARI and AES) IP-Ho Chi Minh City:

- Activities implemented in 2009 (cumulative number of SARI cases>2000):
  - Implementation of the SARI surveillance activities in April 2008 - Nov 2009
  - 731 cases/48% +ve mPCR (41% 1-virus; 6% 2-viruses; 1% 3-viruses)

Influenza: 86% flu A/H3, 9% A/H1, 5% A unsubtyped

SISEA results included in the National Bulletin of respiratory infections since 2008
- Knowledge of influenza viruses strains circulating during 2009. From Jan to Nov 2009:
  - A(H3N2): 53% A(H3N2), 27% B, 10% A(H1N1)soiv, 6% A(H1N1), 4% other viruses; 1% 3-viruses

- Weekly checking the CRFs
- Training: AES case management, Entomological survey of JEV case
- Install office and scientific equipments (data management and diagnostic) Thru monitoring of a sample of patients after discharge Thru ascertainment of diagnosis
- One of the following
  - Cough or breathing difficulty
  - New infiltrate on chest X-ray
  - Use of accessory respiratory muscles
  - Inability to speak full sentences
  - S. pneumoniae

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Improving surveillance in Vietnam (SARI and AES) IP-Nha Trang:

1. Investigation of an outbreak of coronavirus NL-63 detected at the communal level thanks to the multiplex protocols implemented at NIHE through SISEA.
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Improving surveillance in Vietnam: case definition of SARI

<table>
<thead>
<tr>
<th>3-5 days</th>
<th>5-6 days</th>
</tr>
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<tbody>
<tr>
<td>Cough or breathing difficulty</td>
<td>Over a 38°C (oral) fever and/or rash</td>
</tr>
<tr>
<td>General signs of danger</td>
<td>Severe dehydration</td>
</tr>
<tr>
<td>General signs of danger</td>
<td>Low platelet count or bleeding tendency</td>
</tr>
</tbody>
</table>

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Improving surveillance in Cambodia - 2 (Vong & al.):

1. Investigation of an outbreak of coronavirus NL-63 detected at the communal level thanks to the multiplex protocols implemented at NIHE through SISEA.
2. SARI: 01/10/2008 to 30/09/09: 731 cases/48% +ve mPCR (41% 1-virus; 6% 2-viruses; 1% 3-viruses)
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Improving surveillance in Lao PDR:

1. Technical assistance in microbiology and epidemiology
2. ALRI surveillance, complementary approach to the other surveillance system implemented (DIOORS, EWARN, ILI)
   1. ILI: 2007 to 2008: 1071 ILI specimens collected, 99 (9%) positive for H1N1 and B1, 2008: 933 specimens collected, 99 (10.5%) positive for influenza A and B.
   2. ALRI: 2008: 222 specimens collected, 26 (11.7%) positive for influenza A and B.
   - 24 sputum specimens submitted to laboratory testing, 19/24 (80%) - B. pneumoniae, H. influenza.
3. Contribution to ILI surveillance
4. Strengthening virology, bacteriology, epidemiology
5. Implementing a new sentinel site in Luangprabang


Capacity strengthening and epidemiology

Reaching common administrative standards. June 10, 2008:
- Management and Administrative Routines Workshop held in Nha Trang, Vietnam on 29-30 May.

On-site training/Transfer of technology:
- February 2008, Institut Pasteur Cambodia: PCR multiplex, 2 weeks/2 virologist from IP NT
- September/October 2009, Institut Pasteur Cambodia: PCR multiplex, 2 weeks/2 virologist from NCLE (Vientiane, PDR Lao)
- November 2009: 1 bacteriologist from NCLE for 1 month in IPC

HKU-Pasteur Virology Course 2009

- Focus on neurotropic viruses
  - Neurobiology, clinical, molecular virology
  - Practical sessions (molecular, cellular, bioinformatics)
- 24 students, 4 from IPS
- 4 speakers from IP, 3 Asian experts
- SISEA session
29-30 October 2009, Hue City, Vietnam: over 40 experts from Cambodia, China, France, Japan, Laos, Malaysia, Singapore, USA and Vietnam. Co-sponsored with AFD/GMS-CDC project.

CEROPATH Workshop, Siem Reap 17-20 November 2009
Community ecology of rodents and their pathogens in South-East Asia Biodiversity changes and implications in health ecology.
Co-sponsored by universities and institutions from France, Thailand, Belgium, Finland and Laos.
Partnership with CRIRAD

Public health and research = mutual feeding
Research → Public health: cf. Previous slides
Public health → research: Publications supported by the activities of SISEA.

Limitations: data have been collected according to a surveillance objective, and no research design has been really set up regarding to scientific research questions, and financial support is provided for public health concerns

However, the observation of the data raises fundamental or applied research concerns

Next steps ...
• Epidemiological and clinical description of various bacterial or viral infections
• Bacterial resistance: characterization and determinants
• Risk factors for severe infections by pathogen
• Phenotypic and genotypic determinants of viral virulence
• Viral resistance to antivirals
• Diagnosis of SARI by use of scoring system for severity
• Bacteria of interest: M. tuberculosis, B. pseudomalleii, K pneumoniae
• Viruses of interest: influenza, HRV, RSV, hMPV, Bocav
• Clinical outcomes: guidelines/recommendations/GCP for improving patient management, both in ARI and AES

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3. Conclusions/perspectives
• What is SISEA?
• AFD? ADB?
• International perspective: improving surveillance through a better knowledge of some IDDs
• Geographical description: multidisciplinary approach, for example in Vietnam... (6 diagrams)
• Needs and wishes from the partners

After 2010 ...
• Needs and wishes of the partners
• Funding? Who ("WHO"?, AFD, ADB, US-CDC, DHHS, ...)
• Network of laboratories and hospital-based sentinel sites set up at the end of the project = sustainability of the system
• Knowledge, know-how, applicable for many lab techniques
• Geographical expansion within a country or to other countries?
• Other pathologies (rabies, ...), or other EID concerns as viral/bacterial resistance as an emerging infectious disease event
• Improving connection between human and animal surveillance (in line with "One World One Health" initiative)
• Integration with environmental issues and climate change under the scope of...
Better understanding should teach us to avoid such mistakes!

"Knowledge is the heritage of humanity."

« Science doesn't belong to one country, or rather science encompass the whole humanity"

Louis Pasteur (1822-1895)

Many thanks to:
- Institut Pasteur de Cambodia: Dr. Sirenda Vong, Dr. Sowath, Dr. Laurence
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- Institut Pasteur du Vietnam: Pr. Bui Trong Chien, Dr. Vinh Quang Mai,
- Institut Pasteur Hô Chi Minh Ville: Pr. Tran Ngoc Hau, Dr. Lam Quoc, Dr. Nhuong
- Institut Pasteur Nha Trang: Pr. Bui Trong Chien, Dr. Vien Quang Mai,
- Unité de Coordination: Mme Silvia Ostberg, Dr. Roberto Bruzzone (HKU–Pasteur Institute – scientific advisor)

Thanks to all the hospital’s staff involved in the sentinel surveillance.

THANK YOU FOR YOUR ATTENTION