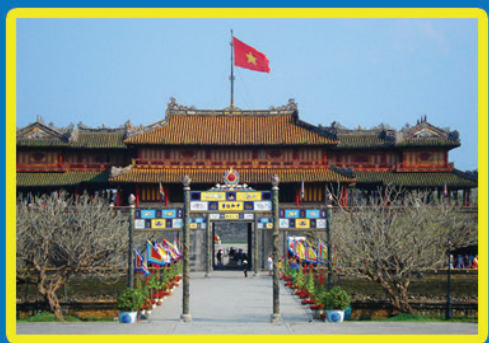




The 7th TEPHINET Bi-Regional Scientific Conference Advancing Public Health for Country Development Danang, Vietnam, 12-14 November, 2013



PROGRAM AND ABSTRACT BOOK



THE CONFERENCE IS SPONSORED BY



TEPHINET

Training Programs in Epidemiology and
Public Health Interventions Network



**World Health
Organization**

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Welcome Messages

From Ministry of Health, Viet Nam

Dear Colleagues, Fellows and Associates,

Viet Nam is honored to host the 7th TEPHINET Bi-regional Scientific Conference on November 12-14, 2013; and on behalf of the Ministry of Health of Viet Nam, I would like to welcome you to the beautiful and dynamic city of Da Nang in the Central of Viet Nam.

This Conference is organized by the Ministry of Health of Viet Nam, the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET), and South Asia Field Epidemiology Technology Network (SafetyNet); with our partners WHO, USCDC, USAID, APEC and FETP programs in the regions.

In recent years, with the emergence of novel diseases causing major public health concerns like Pandemic Influenza (H1N1), Hand foot and mouth disease (HFMD), Avian influenza (H7N9), and Middle East Respiratory Syndrome – Coronavirus (MERS-CoV), health security in general and preparedness and response to public health events in particular have become critical issues to all countries in the regions. This calls governments, agencies and the civil societies to pay more attention and invest in people's health. Only with a healthy public can a country advance faster towards sustainable development, thus the theme of the Conference is: "Advancing Public Health for Country Development".

I hope that the 7th TEPHINET Bi-Regional Scientific Conference in Da Nang will provide a valuable evidence base to address public health challenges and contribute to country development.

It is our wish that participants attending the Conference will have a fruitful and productive experience and can bring home with them lessons learned and shared; as well as friendships won and renewed, and networks strengthened for a healthier Asia Pacific Region.

I look forward to meeting you and welcoming you to Da Nang, Viet Nam in November.

Sincerely yours,

Nguyen Thanh Long, PhD, Prof.

Vice Minister of Health of Viet Nam



From TEPHINET

Dear Colleagues,

It is my pleasure to welcome all the participants to the upcoming 7th TEPHINET Bi-Regional Scientific Conference Southeast Asia and Western Pacific to take place in Da Nang, Viet Nam, one of the fastest growing countries in the region of Asia. The conference will be held on November 12-14, 2013.

This bi-annual conference is a forum whereby the scientific investigations and researches done by the FETP (Field Epidemiology Training Program) fellows from the Western Pacific and South East Asia regions are showcased. It is also an opportunity to share experiences and lessons learned not only by the teaching staff and fellows, but also the impact on public health in their particular countries.

Also, I believe it is important that we have the opportunity to meet during TEPHINET co-sponsored conferences, to exchange information and views about public health issues and applied epidemiology.

This forum theme is centered on “how data or epidemiologic evidence is used for decision making, principally on health issues” which is one of the pillars for country development.

TEPHINET was established in 1997 with the intent to help strengthen international public health capacity through the support of field-based training programs in applied epidemiology and public health practice.

Our global networks are mandated to set the standards by which the programs are gauged. One of the indicators for good performance is the ability to send scientific abstracts to the conference and get a good number of them to be presented either orally or by poster.

It is an honor for our organization to co-host the conference in collaboration with the Field Epidemiology Training Program of Viet Nam, SAFETYNET and all the FETP programs in both regions.

Our challenge is to ensure that our training programs provide graduates with a solid foundation in the science of epidemiology as well as the capacity to manage the resources of our public health systems.

I hope to see all of you this November in Da Nang and please remember that TEPHINET consists of you all.

Sincerely,

Prof. Dionisio Herrera Guibert, M.D., F.M.S., M.A.E., Ph.D.

Director of TEPHINET



Lists of Committees

Executive Committee

Prof. Nguyen Thanh Long, Vice Minister of Health of Viet Nam	Chair
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Dr. Fadzilah Kamaludin, Director of EIP Malaysia	Member
Dr. Murhekar Major, Director of FETP India	Member
Dr. Tran Minh Nhu Nguyen, WHO FETP advisor	Member

Abstract reviewers

Adhikary Sharad, WHO
Alvarado Franklyn Prieto, Colombia
Ansari Jamil, Pakistan
Antaraa Simon, USCDC
Asghar Rana Jawad, Pakistan
Aye Tin Tin, SAFETYNET
Baig Mirza Amir, Pakistan
Baral Kedar, USCDC
Bhandari Gajananda, Japan
Brant Jonas, Brazil
Chongsuvivatwong Virasakdi, Thailand
Choudhri Yogesh, WHO
Chu Chaeshin, Korea
Chuang Shuk Kwan, Japan
Coghlan Ben, Australia
Dao Thi Minh An, Vietnam
Davis Stephanie, Australia
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Do Van Dung, Vietnam
Echenique Horacio, Argentina
El-Hayek Carol, Australia
Garg Renu Madanlal, WHO
Ghafoor Tamkeen, Pakistan
Guardado Maria Elena, Guatemala
Henderson Alden, USCDC
Herrera-Guibert Dionisio, TEPHINET
Iamsirithaworn Sopon, Thailand
Jantsansengee Baigalmaa, Mongolia
Jiraphongsa Chuleeporn, Thailand
Jones Donna, USCDC
Safdar Ranar, Pakistan
Samaan Gina, USCDC
Saraiya Mona, USCDC
Siong Chia, Singapore
Suarez Gloria, Colombia
Sudomo Mohammad, WHO
Sunagawa Tomimasa, Japan
Tallis Graham, WHO
Tayag Erique, Philippines
Tran Dac Phu, Vietnam
Joseph Rachael, USCDC
Kamaludin Fadzilah, Malaysia
Kandel Nirmal, WHO
Kirk Martyn, Australia
Kusnanto Hari, Indonesia
Le Vu Anh, Vietnam
Lo Philip Yi-Chun, Taiwan
McConnell Michelle, USCDC
McPherson Michelle, WHO
Mehata Suresh, India
Miko Tri Yunis, Indonesia
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Murhekar Manoj, India
Nagachinta Tippavan, USCDC
Nakashima Kazu, Japan
Nguyen Tran Hien, Vietnam
Nsour Mohannad, Pakistan
Ntahobakulira Isaac, Rwanda
O'Connor Bridget, Australia
Oishi Kazunori, Japan
Patel Mahomed, Australia
Perry Helen, USCDC
Phan Trong Lan, Vietnam
Pittayawonganon Chakrarat, Thailand
Pramono Dibyo, Indonesia
Quizon Maria Consorcia, SAFETYNET
Roces Maria Concepcion, SAFETYNET
Rolle Italia, USCDC
Ronoatmodjo Sudarto, Indonesia
Rosemawati A, Malaysia
Tran Minh Nhu Nguyen, WHO
Tran Ngoc HUU, Vietnam
Turcios Reina, USCDC
van Gemert Caroline, Australia
Viola Grace, Engender Health
Vu Sinh Nam, Vietnam
Vu Thi Que Huong, Vietnam
Walke Henry, USCDC
Williams Seymour, South Africa
Winter Christian, WHO

Acknowledgement

The organizers of the 7th TEPHINET Bi-regional Scientific Conference would like to acknowledge valuable contributions of committee members, reviewers, authors, presenters and contributors from Ministry of Health Vietnam, TEPHINET, SAFETYNET, USCDC, USAID, WHO, national FETP and affiliated institutions in the Southeast Asia and Western Pacific Regions. Without collaborative efforts of government and international agencies, institutions, programs and individuals committed to applied epidemiology and public health practice, this conference would not be possible. Our special thanks go to the following dedicated offices and staff:

SAFETYNET Office

Dr. Maria Consorcia Quizon
Dr. Tin Tin Aye
Dr. Maria Concepcion Roces
Ms. Annaliza B. Carillo
Ms. Therese Anne Soriano
Ms. Suosdey Din
Ms. Dyah Kusumodewi
Mr. Ian Franco Lim

Vietnam FETP Office

Dr. Tran Dac Phu
Dr Phan Trong Lan
Dr. Vu Ngoc Long
Dr. Nguyen Thi Huong
Dr. Chu Van Tuyen
Mr Tran Viet Dung

TEPHINET Office

Dr. Dionisio Herrera
Ms. Julia Rankine
Ms. Renee Subrams
Ms Lorna Cameron

WHO Country Office

Dr. Tran Minh Nhu Nguyen
Dr. Do Thi Hong Hien
Dr. Hilde Angermeier
Ms. Nguyen Thi An

PROGRAM AT A GLANCE

	Pre Conference Workshop		1st Day		
	Monday, 11 November, 2013		Tuesday, 12 November, 2013		
08:00-08:30	Parallel workshop topics: 1. Scientific writing 2. Sample size calculation 3. Effective public speaking 4. Government - University partnerships for in-service epidemiology training 5. Digital disease detection <i>(Magnolia room, Hibiscus room, Lotus 1,2,3)</i>		Opening Ceremony <i>(Lotus Ballroom)</i>		
08:30-09:00					
09:00-10:00					
10:00-10:30	Break <i>(Level 2-Reception Building)</i>		Break <i>(Level 2-Reception Building)</i>		
10:30-12:00	Workshops (cont') <i>(Magnolia room, Hibiscus room, Lotus 1,2,3)</i>		Parallel Sessions		
			Outbreak <i>(Lotus 1)</i>	Food- & water-borne diseases <i>(Lotus 2)</i>	Respiratory diseases <i>(Lotus 3)</i>
12:00-13:30	Lunch <i>(Buffet Epice Restaurant)</i>		Lunch <i>(Buffet Epice Prestaurant)</i>		
13:30-15:00	Workshops (cont') <i>(Magnolia room, Hibiscus room, Lotus 1,2,3)</i>		Parallel Sessions		
			Non-communicable diseases <i>(Lotus 1)</i>	Environmental & occupation health <i>(Lotus 2)</i>	Vector-borne diseases <i>(Lotus 3)</i>
15:00-15:30	Break <i>(Level 2-Reception Building)</i>		Break <i>(Level 2-Reception Building)</i>		
15:30-17:00	Workshops (cont') <i>(Magnolia room, Hibiscus room, Lotus 1,2,3)</i>		Parallel Sessions		
			Food & water-borne <i>(Lotus 1)</i>	Zoonoses <i>(Lotus 2)</i>	HIV & STI <i>(Lotus 3)</i>
17:00-18:30					
18:30-19:00	FETP Program Directors' Reception		Welcome Banquet <i>(Lotus Ballroom)</i>		
19:00-21:00					

Registration

PROGRAM AT A GLANCE

2nd Day			3rd Day			
Wednesday, 13 November, 2013			Thursday, 14 November, 2013			
Technology for Epidemiology Speakers: 1. Dr Mark Smolinski 2. Dr Dionisio Herrera (Lotus Ballroom)			Updates on Zoonosis and One Health Speakers: 1. Dr Scott Newman (Lotus Ballroom)			08:00:08:45
Video Conference on MERS Coronavirus & Avian Influenza A/H7N9 Speakers: Dr. Mark Oberle Dr. Feng Zijian Dr. Dave Swerdlow (Lotus Ballroom)			Panel Discussion on One Health (Lotus Ballroom)			08:45:10:00
Break (Level 2-Reception Building)			Break (Level 2-Reception Building)			10:00:10:30
Parallel Sessions			Tour			10:30:12:00
Food & water-borne diseases (Lotus 1)	Vaccine preventable diseases (Lotus 2)	Surveillance (Lotus 3)				
Lunch (Buffet Epice Restaurant)						12:00:13:30
Parallel Sessions						
Non-communicable diseases (Lotus 1)	Public Health Interventions (Lotus 2)	Respiratory diseases (Lotus 3)				13:30:15:00
Break (Level 2-Reception Building)						15:00:15:30
Parallel Sessions						
Outbreak (Lotus 1)	Zoonoses (Lotus 2)	Food & water-borne diseases (Lotus 3)				15:30:17:00
						17:00:18:00
International Night (Poolside)						Awards and Closing Ceremony
						19:00:21:00

Registration & Information

Check-in desk

Please kindly note that the conference organizer will set up a table on the right hand side of the reception desk of Pullman Beach Resort and Fansipan Hotel to assist participant with hotel check-in and check-out, registration and on site payment for hotel booking as well as the registration fee.

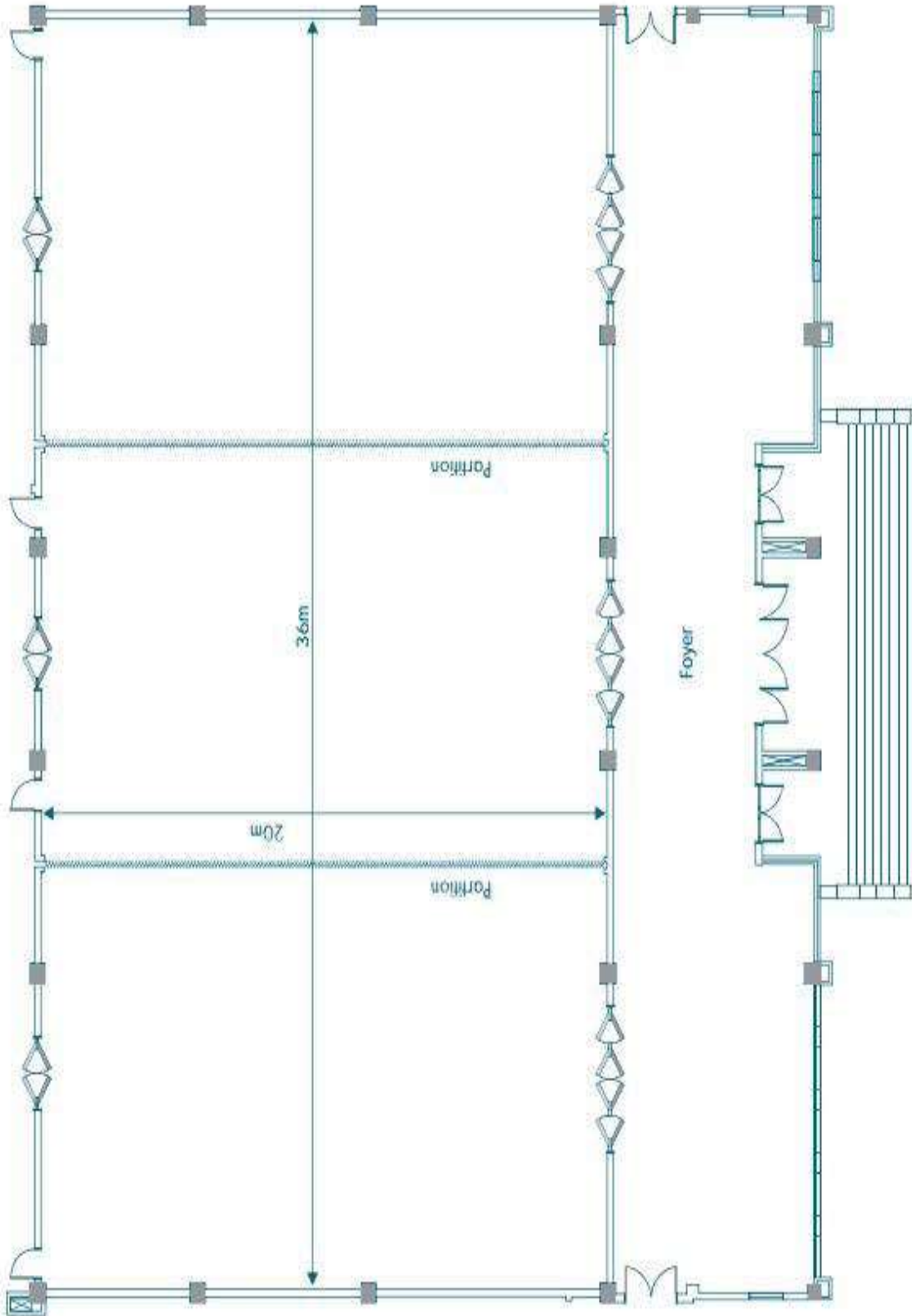
Registration

Please kindly note that we open registration tables in front of meeting room everyday for participants to register, pay conference fee and getting documents, name badges, conference booklets and souvenirs etc.

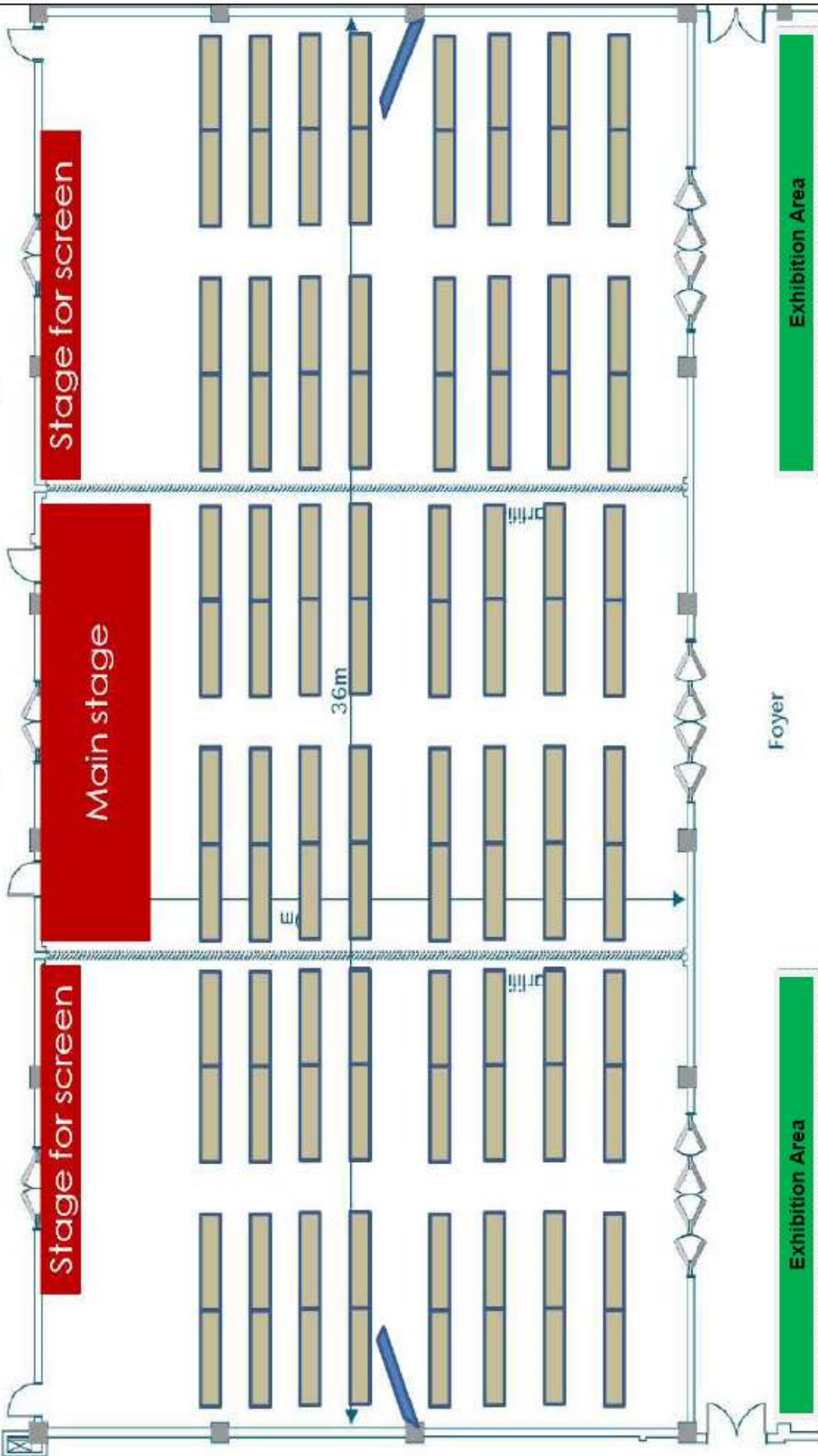
Registration desk will be open during the conference days from 07:30AM to 20:00PM.

Participants can also register for conference tour on November 14 and confirm the airport drop-off.

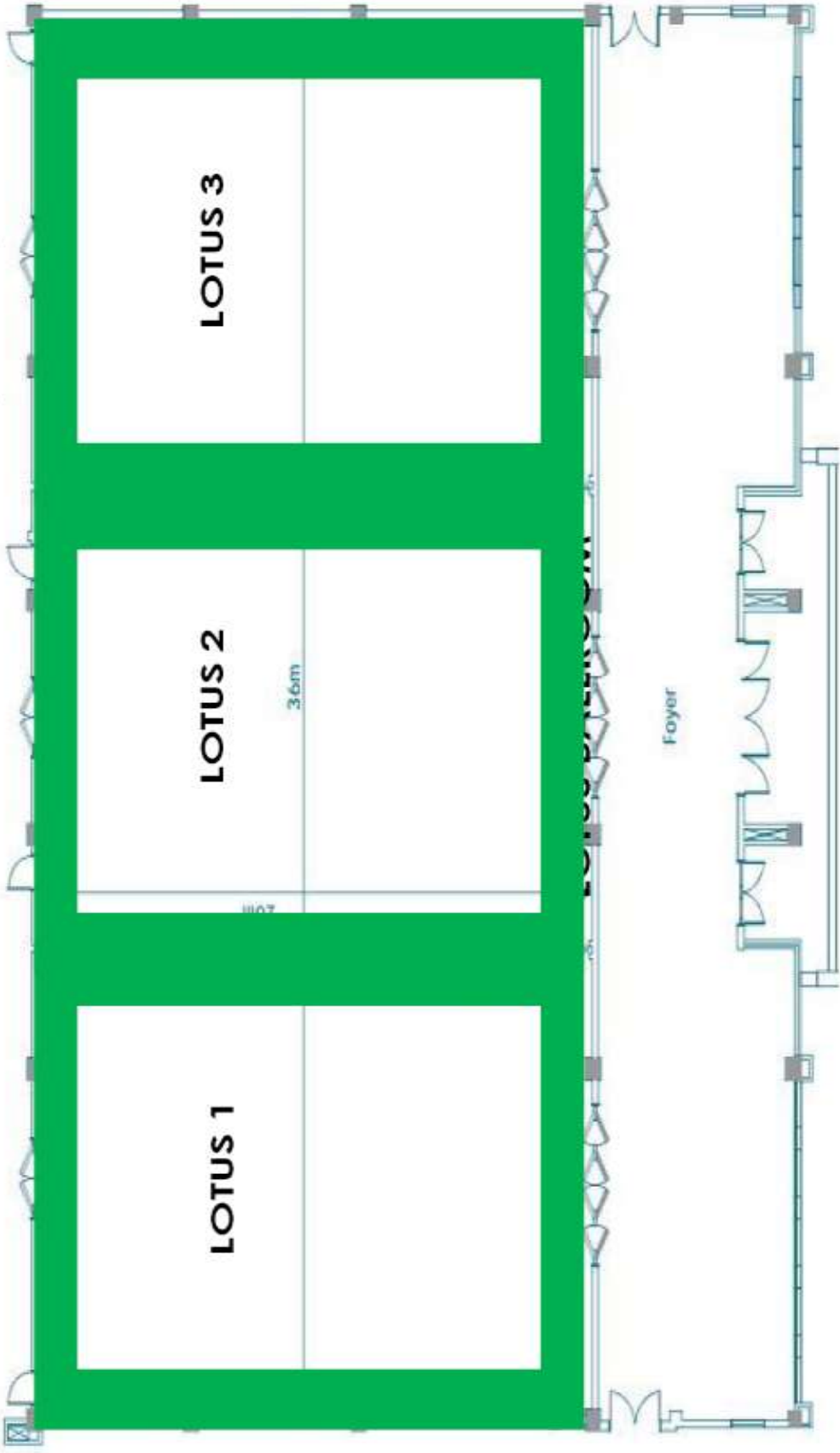
Layout of Conference venues



PLENARY ROOM (08:30AM – 10:00AM)

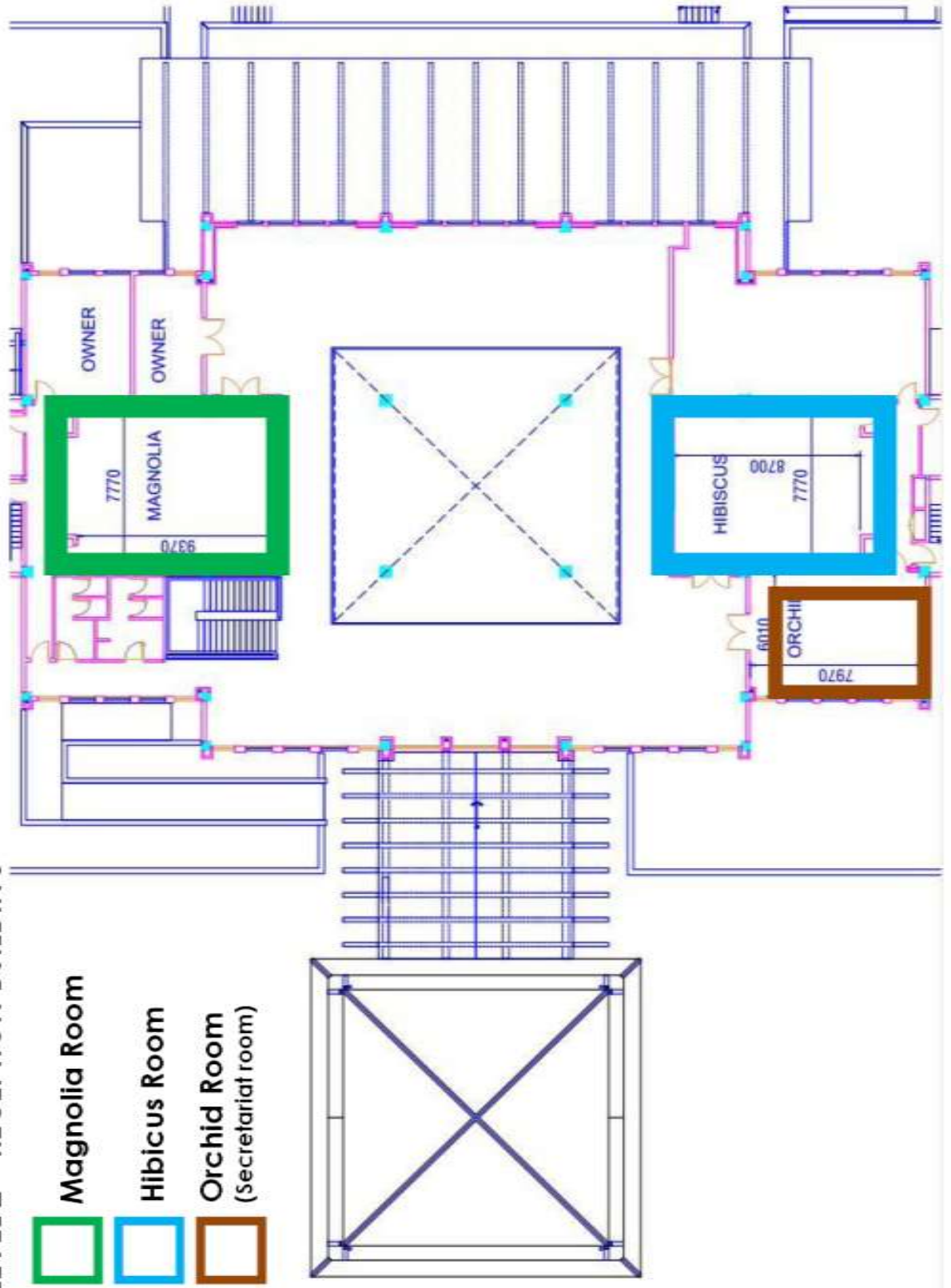


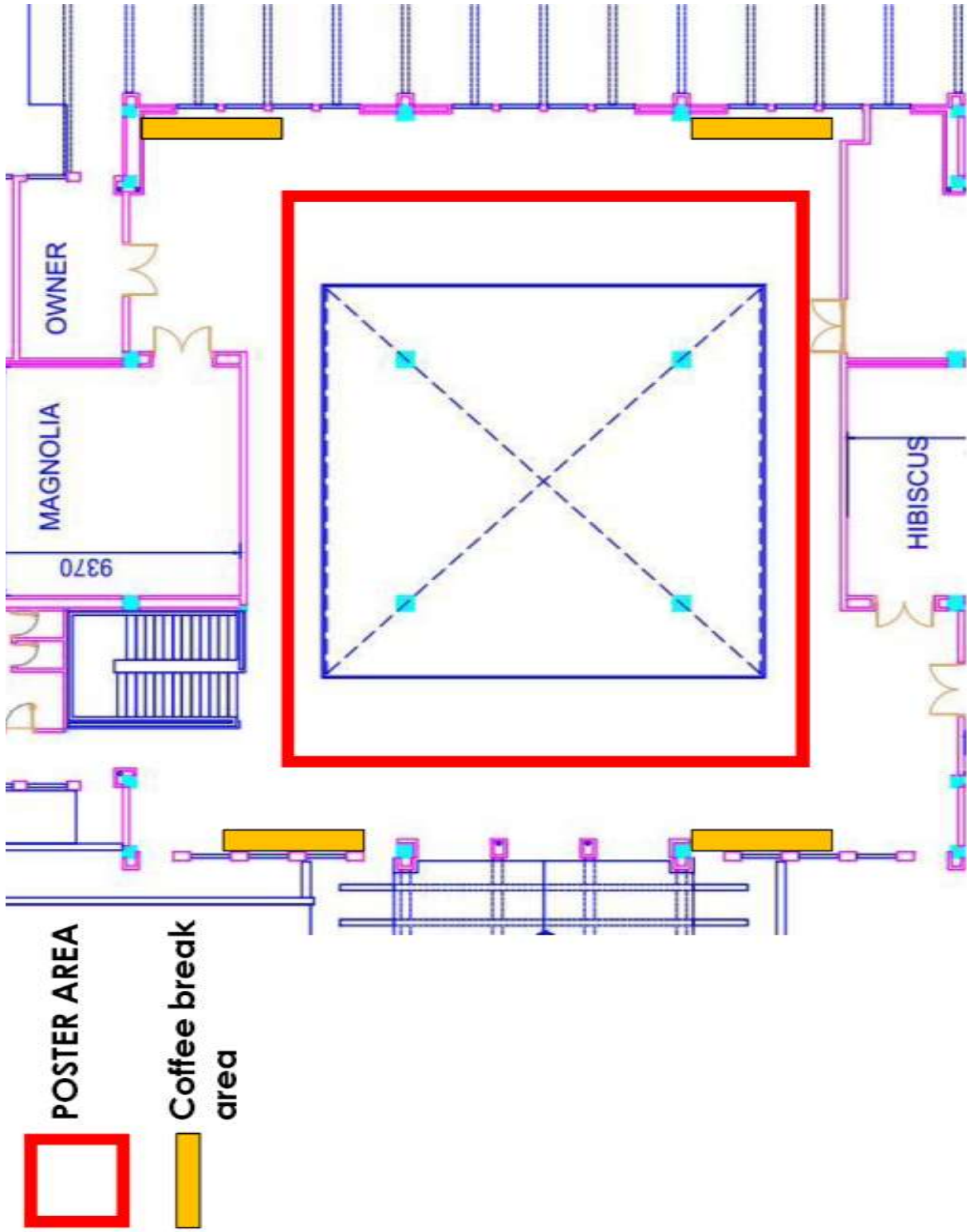
ORAL PRESENTATION – breakout rooms: Lotus 1, Lotus 2, Lotus 3



LEVEL 2 – RECEPTION BUILDING

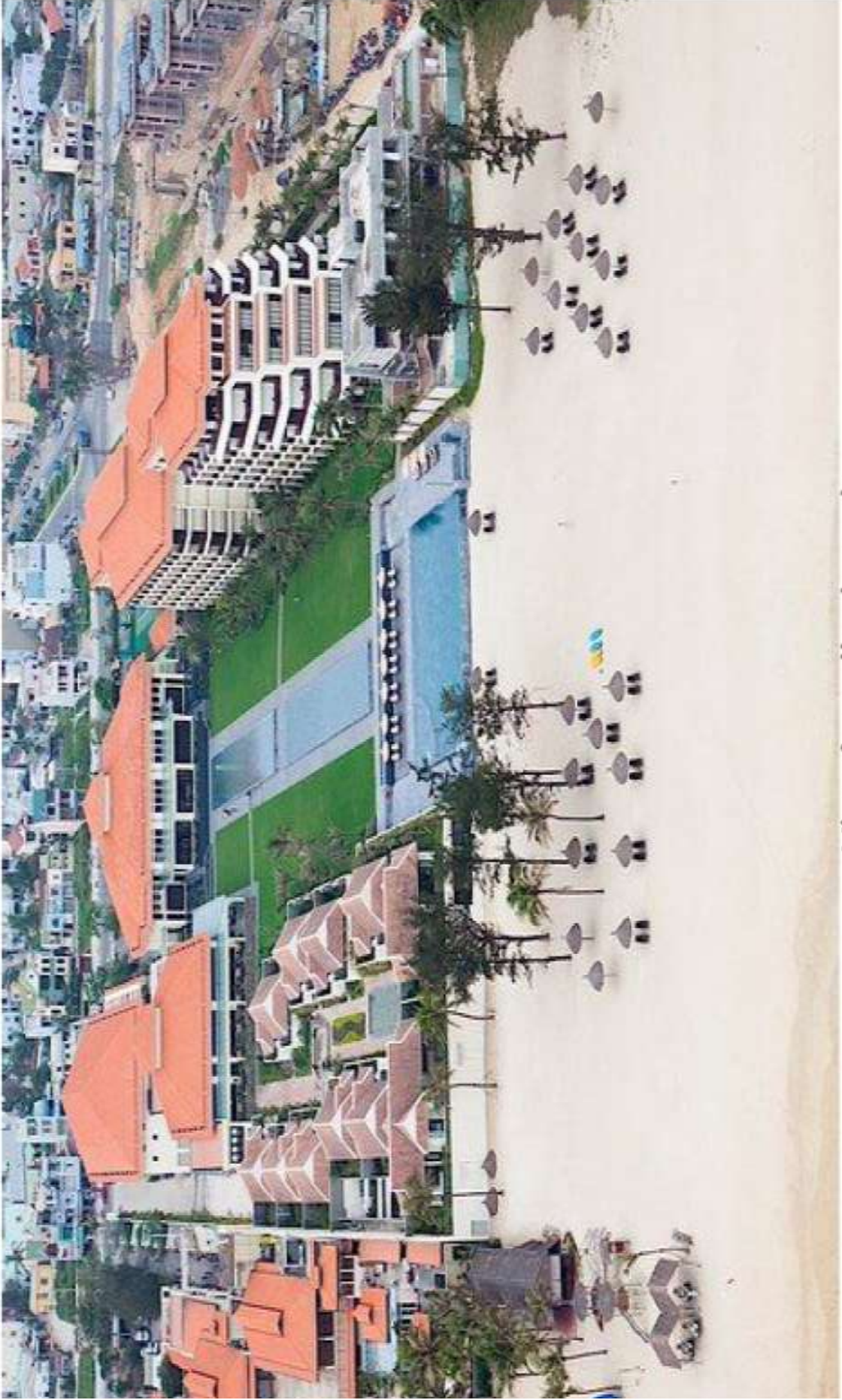
-  Magnolia Room
-  Hibiscus Room
-  Orchid Room
(Secretariat room)





POSTER AREA

Coffee break area



View from the beach



View from the front

Conference Program

Pre-Conference Workshop

Monday, 11 November 2013

Plenary and parallel sessions

Tuesday, 12th November 2013

- 08.30 – 09.00 Opening Ceremony
- 09.00 – 10.00 Plenary: Using Epidemiological Evidence to Influence Health Policy & practice
- 10.30- 12.00 Parallel sessions
 - Session O1: Outbreak
 - Session O2: Food and waterborne diseases
 - Session O3: Respiratory diseases
- 13.30- 15.00 Parallel sessions
 - Session O4: Non-communicable diseases
 - Session O5: Environmental and occupation health
 - Session O6: Vectorborne diseases
- 15.30-17.00 Parallel sessions
 - Session O7: Food and waterborne diseases
 - Session O8: Zoonoses
 - Session O9: HIV/STI

Wednesday, 13th November 2013

- 08.30 – 08.45 Plenary: Technology for Epidemiology
- 08.45 – 10.00 Video Conference: Updates on H7N9 and MERS- CoV
- 10.30- 12.00 Parallel sessions
 - Session O10: Food and waterborne diseases
 - Session O11: Vaccine preventable diseases
 - Session O12: Surveillance
- 13.30- 15.00 Parallel sessions
 - Session O13: Non-communicable diseases
 - Session O14: Public health interventions
 - Session O15: Respiratory diseases
- 15.30-17.00 Parallel sessions
 - Session O16: Outbreak
 - Session O17: Zoonoses
 - Session O18: Food and waterborne diseases

Thursday, 14th November 2013

- 08.00 – 08.45 Plenary: Updates on Zoonoses and One Health
- 08.45 – 10.00 Panel Discussion on One Health
- 10.30- 17.00 City Tour
- 18.00- 19.00 Awards and Closing Ceremony

PRE-CONFERENCE WORKSHOP

List of pre-conference workshops

Workshop	Time	Venue
1: Scientific Writing	9.00-15.00	Magnolia room
2: Sample Size Calculation	8.30-17.00	Hibicus room
3: Effective Public Speaking	8.00-17.00	Lotus 1
4: Government-University Partnerships	9.00-16.30	Lotus 2
5: Digital disease detection	8.00-17.00	Lotus 3

The conference workshops provide short courses to upgrade the knowledge and skills of the participants in the area of epidemiology, technology, zoonoses, management and statistics. There will be a maximum of 30 participants per course.

Details of selected pre-conference workshops: 11th, November, 2013 (8:00am-5:00pm)

Name of workshop	Responsible person/ Organization	Objective/Content	Date/Time	Contact person
Workshop 1: Writing a scientific manuscript	Michelle McPherson	<p>Scientific writing workshop</p> <p>This workshop is designed to introduce participants to a structured approach to writing scientific papers for publication in peer reviewed journals. During the workshop, the writing process will be broken into a series of smaller steps and participants will be shown how to develop a writing plan which forms the basis of a full manuscript. The course will be run by the Coordinating Editor of the Western Pacific Surveillance and Response journal – a journal aimed at publishing field epidemiological studies including surveillance and outbreak reports and risk assessments.</p>	<p>11th November, 2013</p> <p>9:00am -3:00 pm</p>	<p>Michelle McPherson</p> <p>Coordinating Editor</p> <p>Western Pacific Surveillance and Response Journal</p> <p>World Health Organization</p> <p>WPSAR@wpro.who.int</p> <p>Tel: +632 52 89920</p> <p>(maximum of 30)</p>

<p>Workshop 2: Sample size calculation</p>	<p>Dr Maria Concepcion Rocces Technical Officer SAFETYNET Dr Mark White</p>	<p>An essential part of planning a survey is to decide how many people need to be studied in order to answer the study objective with sufficient statistical power. Often the number is just pulled out of a hat, or decided purely on the basis of logistics. This is not good practice. Studying many more persons than necessary is a waste of time, money and resources. On the other hand, embarking on a study too small to be able to answer its objectives is also questionable and may be a waste of effort.</p> <p>This workshop will review the principles and methods for calculating sample sizes for simple random surveys and cluster surveys. The two-hour session will consist of lectures and exercises along with a live demonstration of how to use Rightsize, a software developed by Dr. Mark White for the use of field epidemiologists. The sample exercises are drawn from the experience of FETP fellows/officers from Asia.</p>	<p>11th November, 2013 8:00 am – 5:00 pm</p>	<p>Dr Maria Concepcion Rocces 10-15 (maximum of 20)</p>
<p>Workshop 3: Effective Public Speaking</p>	<p>Professor Pinky SOLAIR Bldg., UP Diliman, Quezon City</p>	<p>The objective of the course is to improve the knowledge, attitude and skill of participants on effective public speaking and oral communication</p>	<p>11th November, 2013 8:00 am – 5:00 pm</p>	<p>Ms. Marinela M. Aseron (maximum of 30)</p>

<p>Workshop 4: Government - University partnerships for in-service epidemiology training</p>	<p>Dr. Raymond Hyatt (Tufts University); Dr. Stan Fenwick (RESPOND)</p>	<p>Objectives -</p> <ul style="list-style-type: none"> • To highlight successful partnerships for in-service outbreak response and field epidemiology training • To identify the challenges and constraints to government-university partnerships for training • To evaluate the lessons learned from previous training partnerships • To develop recommendations for future government - university training partnerships 	<p>11th November, 2013 9:00 am – 4:30 pm</p>	<p>By invitation only</p>
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<p>Workshop 5: Digital disease detection</p>	<p>Dr. Marjorie Pollack MD - Deputy Editor, PromED-mail</p>	<p>Upon completion of the training, the participants will be able to</p> <ol style="list-style-type: none"> 1) To identify the benefits and challenges of using new digital disease detection sources. 2) Describe available online tools and information sources for early detection of emerging and reemerging infectious diseases. 3) Examine critical issues in digital disease detection – including validation, ethics, and the development of a baseline methodology. 	<p>11th November, 2013 8:00 am – 5:00 pm</p>	<p>Dr. Marjorie Pollack MD - Deputy Editor, PromED-mail (maximum of 50)</p>
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Content of Plenary and Oral sessions

Day 1, Morning, 08.30–10.00, 12 November, 2013

Opening Ceremony

Plenary session: Using Epidemiological Evidence to Influence Health Policy and practice

Speakers: 1. Professor Nguyen Cong Khan
2. Professor Pekka Nuorti

Day 1, Morning, 10.30–12.00, 12 November, 2013

Session O1: Outbreak

O1.1. An outbreak of Enterotoxigenic Escherichia coli (ETEC) associated with contaminated steel pipe well water in a rural community in Chengdu, Sichuan, China, 2013

Hui Chen, M. Wang, X. Zhou, L. Zhang and L. Liu

O1.2. Investigation of Hepatitis A Outbreak - Kulon Progo District, Indonesia, 2012

Henry Surendra, R.K. Harisaputra, D. Rosadi, S. Rahmah, Sugiarto and B. Murtiningsih

O1.3. An Outbreak of Acute Gastrointestinal Illness Following Consumption of Hydrogen Peroxide-contaminated Noodles at a Junior High School — Taiwan, April 2013

Hsin-Chun Lee, W-C Chen, M-C Liu, S-E Huang, W-T Huang, Y-L Liu, D-S Jiang and Y-C Lo

O1.4. An Investigation of Acute Gastroenteritis Outbreak in an International Meeting, Ministry of Public Health-Thailand, 2013

Thanidtha Te-chaniyom, S. Wechwithan, N. Yimchoho, N. Sinanan, T. Imsuwanasi, Y. Xie, L. Voradetwittaya, S. Piriyaornpipat, S. Lai, J. Zhang and C. Jiraphongsa

O1.5. Cholera outbreak in a Geographically Isolated Island in Mindanao with On-going Armed Conflict-Philippines, 2013

Remegio A. Javier, MJ Zapanta, VC de los Reyes, NM Sualdito and EA Tayag

O1.6. Investigation of a Food Poisoning Outbreak during the Recitation Activity in Moyudan District, Sleman Regency, Yogyakarta, 2012

Cecep Heriana, L. Fauzi, B. Murtiningsih and A. Prasudi

Session O2: Food and waterborne diseases

O2.1. An Outbreak of Salmonella Typhimurium Gastroenteritis caused by contaminated food container in a School, Sichuan Province, China, 2013

Xingyu Zhou, L. Zhang and L. Liu

O2.2. Diarrhea Outbreak in Puhpelem Village, Wonogiri, Central Java, Indonesia, 2013

Sandi A. Primaherta, M. Syairaji, Widyastuti, R. Sholikhin, S. Heryanto and C. Indriani

O2.3. Associations between Antimicrobial Susceptibility Patterns of Shigella Isolates and Suspected Country of Acquisition - Victoria, Australia, 2008-2012

Courtney Renee Lane, N. Stephens, C. Walker, B. Sutton, J. Powling, M. Valcanis and J. Gregory

- O2.4. Resurgence of Cholera among T'boli indigenous people, Mindanao, Philippines 2013
Ruth Alma A. Ramos, J.E. Ballera, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag
- O2.5. An Outbreak of *Vibrio Parahaemolyticus* Infections Associated with Eating insufficient cooked crab in a Tour Group at a Coastal city-Guangdong province, China, 2012
Heng Zhang, Q. Huang, H. Liang, H. Liu, L. Ma and L. Deng
- O2.6. Foodborne Gastroenteritis Outbreak following a Village Feast-Temanggung, Central Java, Indonesia, 2013
Mohamad Anis Fahmi, D. Jumianto, B.S. Wiratama, Misinem, C. Indriani, K. Mualim and Masruchi

Session O3: Respiratory diseases

- O3.1 Effect of Smoking on Sputum Conversion of Patients undergoing Treatment for Tuberculosis-Bogor District, West Java, Indonesia, 2011-2012
Dimas Panduasa and S. Ronoatmodjo
- O3.2. An outbreak of Influenza A (H1N1) virus in a remote Aboriginal community post pandemic-Kimberley region, Australia, 2013
Philippa J. Chidgey, S. Davis, P.Williams and C.Reeve
- O3.3. Nutritional Stunting and Tuberculosis among Children in West Bandung District, West Java, Indonesia
Jahiroh Jahiroh
- O3.4. Risk factors for human infection with avian influenza A (H7N9) virus in Zhejiang Province, China, 2013
Meng Zhang, F. He, J. Lin and H. Ma
- O3.5. Influenza A Outbreak among National Service Trainees, Melaka , Malaysia 2013
Intan Azura Mhd Din, Noorhaida U, Shazelin AP and Fadzilah K
- O3.6. The Influence of Therapy Adherence to the Conversions of Smear Positive TB Cases In Denpasar, Bali, Indonesia 2012
Artawan Eka Putra I Wayan Gede and Pradnyadewi N.L.N.T.A

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Session O4: Non-communicable diseases

- O4.1. Determinants of Malnutrition among Toddlers in Rangkasbitung, Lebak District, Banten Province, Indonesia
Bakhtiar Bakhtiar and R. Mahkota
- O4.2. Prevalence, Awareness, Treatment and Control of Hypertension among Adults, Hubei Province, China, 2010
Tian Jing He, L. Zhang, Q. Zhang, S. Zhu, J. Pan and T. Shen
- O4.3. Burden of retinopathy amongst self-reported diabetic patients attending rural public health facilities-- Kancheepuram, India 2013
Tony Fredrick, M. Murhekar, J. Yuvaraj, P. Kaur and R. Sudh

O4.4. Incidence and characteristics of unintentional non-fatal injuries: a community survey in the Central Highlands of Vietnam, 2013

Phan Thi Thanh Thao, Duoc Tho Pham, Phu D. Tran, Lan Trong Phan and Nguyen Nhu Tran Minh

O4.5. Association between Anger Expression and Incidence of Essential Hypertension - Kulon Progo District, Indonesia, 2013

Henry Surendra, D. Rosadi, Y.S. Prabandari and I.D.P. Pramantara

O4.6. Preliminary Results of an Investigation of a Beriberi Outbreak among Workers in a Factory in Phanom Sarakham, Chascheongsao Province-Thailand, July 2013

Nguyen Phan Ha Ai, C. Pittayawonganon, C. Jiraphongsa, H. Praekunatham, P. Thitichai, T. Shen, T. Soe and N. Lwin

Session O5: Environmental & Occupational health

O5.1. Prioritization of Health Problems in Purbalingga District, Central Java in 2012 using the Hanlon Method

Bayu S. Wiratama, R. Abdurrahman, Semedi and D. Pramono

O5.2. Unusual microsporidial keratoconjunctivitis outbreak among international rugby players - Singapore, 2012

James Tan, P. Lee, Y. Lai, P. Hishamuddin, J. Tay, A. L. Tan, K. S. Chan, R. Lin, D. Tan, P. L. Ooi and J. Cutter

O5.3. Analysis of the influence of childcare workers' infectious disease knowledge on kindergarten infectious disease: cumulative incidence in 2011, Fengtai district, Beijing, China

Rui-ping Wang, M. Zhang, L. Cui, Q. Zhang, H. Ma and L. Zhang

O5.4. Influence of Climate on Dengue in Ho Chi Minh City, Viet Nam, 2001- 2010

Hoang Quoc Cuong, Nguyen X. Ho, Vu T. Nguyen, Quang C. Luong, Huu N. Tran, Lan T. Phan, Hau V. Pham, Nguyen N. Tran Minh, and Khoa T. Dang

O5.5. A Community-Based Case-Control Study on an Outbreak of Unknown Fatal Lung Injury in South Korea, 2011-2012

Ji-Hyuk Park, J. Gwack and S. Youn

O5.6. Investigation of a family cluster of nitrite poisoning--Suzhou City, Jiangsu Province, China, 2013

Rui-ping Wang, C. Teng, J. Zhang, N. Zhang, H. Liu and Y. Zhou

Session O6: Vector borne diseases

O6.1. Occurrence of Chikungunya and Dengue Coinfections in Western Visayas, Philippines, 2013

Ruth Alma A. Ramos, RJ Ventura, VC de los Reyes, MN Sucaldito and EA Tayag

O6.2. Performance Evaluation of Plasmotec Malaria-3 in Detecting Plasmodium falciparum Infection: a Medical Record-Based Study in Mimika District, Papua, Indonesia, 2013

Fransisca Liony, K. Haripurnomo and K. J. Hari

O6.3. Surveillance of Hosts and Vectors of Plague in a Plague Endemic Area in Vietnam

Le Manh Hung, D. Dang, Hau V. Pham, Lan T. Phan, N. Tran Minh and Long Vu

O6.4. Falciparum Malaria Outbreak in a Low Transmission Area—Penampang, Sabah, Malaysia, 2012

Saffree Jeffree Mohammad and O. Mihat

O6.5. Chikungunya Fever Outbreak in Western Visayas, Philippines, 2013

Ray Justin C. Ventura, P. Ching, VC de los Reyes, MN Sucaldito and EA Tayag

O6.6. Efficacy of artemisinin-based combination therapies in the treatment for uncomplicated falciparum malaria – Central Vietnam, 2007 – 2011.

Huynh Hong Quang, T. Trieu, C. Nguyen, G. Li and Y. Song

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O7.1. A Gastroenteritis Outbreak Caused by Norovirus genogroup II in a Primary School, Jiangsu Province, China, 2012

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O7.2. Spatial Analysis of Environmental Determinants of Acute Diarrhea among Children aged 5-14 years in Kulon Progo District, Yogyakarta, Indonesia, 2011

Ratna Wijayanti, M. Juffrie and L. Lazuardi

O7.3. Paralytic Shellfish Poisoning: Implications of Absent Red Tide Monitoring in a Mussel Farm - Visayas, Philippines, 2013

Paola Katrina G. Ching, R.A. Ramos, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

O7.4. A Cluster of Sudden Unexplained Deaths Associated with Newly Established Toxic Mushroom, *Trogia venenata*-Sichuan, China, 2012

Ming Zhao, W. Yuan, Y. Gao, Z. Feng and G. Shi

O7.5. An outbreak of gastroenteritis among workers at a large canteen – Binh Duong, Vietnam, 2012

Vo Huu Thuan, D. Nguyen, P. Nuorti, L. Le, Lan Trong Phan and Nguyen Nhu Tran Minh

Session O8: Zoonoses

O8.1. Surveillance of Avian Influenza H7N9 virus in poultry in the North of Vietnam, 2011 – 2013

Nguyen Van Long, T.D. Nguyen, T. D. Hoang, N.T. Nguyen, H.D. Do, L. Loth, S. Newman and V.D. Pham

O8.2. Prevalence of *Taenia saginata* Infection among Raw Beef Lawar Consumers in Sukawati District, Gianyar, Indonesia, 2012

Dewa Oka Harimbawa, S. Sawitri and N. Adiputra

O8.3. A Survey on Residents' Knowledge, Attitudes, and Practices on Rabies and Dog Profile of a Suburban Municipality East of Manila, Philippines 2013

Luis M. Sy Jr., M.C. Roces, M.E. Miranda, A. de Guzman, R. Javier, M. Zapanta, J. Ballera, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

O8.4. Swine Influenza viruses, a zoonotic threat with pandemic potential - Vietnam, 2013
Nguyen Ngoc Tien, C.T. Nguyen, V.T. Le, K. Inui, L.T. Ngo, L. Loth, D.V. Pham, T. T. Nguyen and S. Newman

O8.5. Re-emerging Zoonotic Disease: Alarming Increase in the number of Human Rabies Cases in Cagayan Valley Region, Philippines, 2013
Ray Justin C. Ventura, J. Velasquez, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Session O9: HIV-STI

O9.1. Factors associated with Mortality among HIV-infected Adults receiving Antiretroviral Therapy in Khanh Hoa, Vietnam

Ton Nu Hong Vy, T.V. Tran, R. Miller, H.T. Do, Lan T. Phan, Phu D. Tran and P. Vapattanawong

O9.2. Generating HIV Estimates data using Spectrum software, India, 2012

Chinmoyee Das, U. Jha, Y. Raj, S. Venkatesh, A. Pandey, D. Sahu and T. Bakkali

O9.3. HIV Sentinel Surveillance of HIV prevalence and access to health services among men who have sex with men in Viet Nam

Bui Hoang Duc, T. Duong and H. Phan

O9.4. Risk behaviors and Case Detection among HIV-infected Pregnant Women Living in High HIV-prevalence Areas in China

Ya Ping Qiao, L.W. Fang and L.H. Wang

O9.5. HIV – HBV – HCV situation among intravenous drug users in central Vietnam, 2012

Do Thai Hung, D. Nguyen, H. Le, M. Trinh, V. Ton, L. Yoshida, C. Bui, Phu D. Tran and K. Ariyoshi

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Plenary session: Technology for Epidemiology

Speakers: 1. Dr Mark Smolinski

2. Dr Dionisio Herrera

Video Conference: Updates on H7N9 and MERS- CoV

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Session O10: Food and waterborne diseases

O10.1. *Vibrio parahaemolyticus* Enteritis Outbreak following a Wedding Banquet in a Rural Village – Kampong Speu, Cambodia, April 2012

Vandy Som, L. Som, P. Has, J. Denny and M.C. Roces

O10.2. Outbreak of water-borne typhoid fever attributed to a contaminated well in a rural junior high school in Hunan province, China, 2013

Jun Ling Sun, H. Zhou, J. Zhang, H.L. Ma and F.Q. Liu

O10.3. Food Poisoning Outbreak in a Refugee Camp in Central Java, Indonesia, 2011

Lalu H. Hutomo, F. Mansur, T. Wibowo and S. Darojah

O10.4. Outbreak of *Vibrio parahaemolyticus* gastroenteritis traced to contaminated hard-boiled eggs – Singapore, 2012

Pream Raj Sinnasamy, Q.Y. Pang, P. Hishamuddin, J. Tay, P.L. Ooi and J. Cutter

O10.5. Outbreak of *Escherichia coli* gastroenteritis at a Boarding School--Samarahan, Sarawak, Malaysia, February 2013

Julaidah Sharip, N. A. Rahim and S. Syukuri

O10.6. Investigation of Diarrhea Cases in Subdistrict Dlingo, Bantul Yogyakarta, Indonesia 2012

Nooria Sukmaningtyas, D. Eliana, B. Murtiningsih and T. B. Santasa

Session O11: Vaccine preventable diseases

O11.1. A Measles Outbreak in Serdang Bedagai District, Indonesia, 2012

Frans Yosep Sitepu, R. Rangkuti, A. Fahmi and Nirwana

O11.2. Neonatal Tetanus and Possible Associated Risk Factors in Central Region of Viet Nam, period 2002-2011

Do Manh Hung, Hang M. Nguyen, Phu D. Tran and Hien Do

O11.3. Association between Behaviors and Hepatitis A Incidence in Depok District, Sleman, Yogyakarta, 2013

Siti Rahmah and C. Indriani

O11.4. An Investigation of a Family Cluster of Diphtheria with Deaths in Nakhon Si Thammarat Province, Thailand, 2012

Seesai Yeesoonsang, K. Chukong, C. Libnoi, P. Klaiduang, S. Kamsaman, K. Suwana, K. Mhonpangthiem, P. Siriarayapon and C. Pittayawonganon

O11.5. Prolonged Diphtheria Outbreak in Houaphanh Province, Lao PDR, September 2012-January 2013

Khamla Lerdsaway, A. Phetphaythong, K. Vilaphanh, V. Phomvongsy, P. Phimmachane, C. Soulaphy, B. Khamphaphongphane, M. Phengxay and C. Winter

O11.6. Investigation of Diphtheria Outbreak at Bondowoso District, East Java, Indonesia, June 2011

Friskila Damaris Silitonga, B. Murtiningsih, A. Prasudi and M. Pulungan

Session O12: Surveillance

O12.1. Role of media scanning and verification system as a supplemental tool to disease outbreak detection and reporting under the integrated disease surveillance program (IDSP)-India

Rajeev Sharma, A. Karad, B. Dash and L. S. Chauhan

O12.2. Event-based Surveillance System (ESR): Philippine FETP Trainees Know Where the Outbreaks Are

Vikki Carr de los Reyes, MN Sucaldtjo and EA Tayag

O12.3. Needs Assessment of Flood Victims In North Jakarta-Indonesia, January 2013

Jusly A. Lakapu, A.T. Endarti, S. Saleh, Bachtiar, P. Hafsari, S. Despriningtyas, M. Korib and H. Budi

O12.4. Model Development of Integrated "One Health" West Nile Encephalitis Surveillance in Kanchanaburi, Thailand, 2012

Paisin Lekcharoen, W. Ardkhean, R. Wutthanarungsan, M. Worasuwanarak, P. Chuawong, V. Jongpiputvanich, K. Tonchiangsai, P. Prasomthong, P. Pradit, T. Pairthaisong, S. Jiemtaweeboon, S.

Ritter, K. Sujit, S. Kuhapan, P. Churat, T. Parnlak, R. Jongcharasorn and M. Khaengkhetka

O12.5. Adverse Event Following Immunization (AEFI) and Acceptability Survey following Seasonal Influenza Vaccine Introduction in Lao PDR 2012

Phontavy Khodsimueg, K. Sengsaiya, M. Phengxay, S. Mirza, R. Reyburn, J. Bresee, A. Moen, V. Khanthamaly, C. Winter, A. Corwin and A. Xeuatvongsa

O12.6. What is the Best Model for Serious Adverse Events Following Immunisation (AEFI) Surveillance in Australia?: Evaluation of Surveillance for Intussusception (IS) Following Rotavirus Vaccines as a Case Study

Alexis Pillsbury, H. Quinn, K. Macartney, M. Kirk and P. McIntyre

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Session O13: Non-communicable diseases

O13.1. Type D Personality as Predictor of Essential Hypertension in Sleman District, Yogyakarta Province, Indonesia

Lukman Fauzi and L. Anggorowati

O13.2. Nutritional status of children aged less than five years in Xuan Quang commune, Chiem Hoa district, Tuyen Quang province, Vietnam, 2011

Le Thi Huong, P. Le, H. Dao and H. Tran

O13.3. Cancer Incidence in 6 cancer registries in Jiangxi Province, China

Jie Liu, L. Zhu, P. Yu, X. Yang, A. Li, L. Ji and J. Zhao

O13.4. Breast Cancer Risk Factors among patients in Labuang Baji General Hospital, Makassar, South Sulawesi Province, Indonesia, 2013

Sukardi Pangade and A. Marisa

O13.5. Prevalence and risk factors for periodontal disease among adults, China, 2013

Qi Zhang, Z. Li, C. Wang, Y. Yang and L. Wang

Session O14: Public Health Interventions

O14.1. Newborn care Practices and challenges in Home Based Postnatal Newborn care (HBPNC) programme -Mewat, Haryana, India, 2013

Latika Nath, M. Murhekar, P. Kaur and R. Gupta

O14.2. Health insurance coverage and its impact on healthcare cost among the Chinese floating population

Yinjun Zhao, L. Wang, Y. Jiang and Y. Li

O14.3. Barriers to temporary modern contraceptive use among eligible couples of Nongstoin Block, West Khasi Hills District, Meghalaya, India 2013: Population-based case-control study

Rapborlang Laloo, T. Bhatnagar and P. Kamaraj

O14.4. Effect of Vitamin A and D Supplementation on Acid Fast Bacillus (AFB) positive Pulmonary Tuberculosis Patients' Sputum Conversion Acceleration during the Intensive Treatment Phase, Wonosobo district, Indonesia, 2012-2013

Pratiwi Rita Dian

O14.5. A 2012 Fireworks Injury Prevention Campaign with a Decrease in Fireworks Use among School

Children – Philippines, 2013

Paola Katrina G. Ching, RA Ramos, MJ Zapanta, VC de los Reyes, MN Sucaldito and EA Tayag

O14.6. Breastfeeding practices in an indigenous minority community group: A cross-sectional study from Nepal

Narayan Subedi, S. Paudel and A. K. Poudyal

Session O15: Respiratory diseases

O15.1. A rubella outbreak in female migrant workers – Hong Kong, 2011

Miuling Wong, YK Wan, SK Chuang

O15.2. Distinct Risk Profiles for Human Infections with the Influenza A (H7N9) Virus among Rural and Urban Residents: Zhejiang Province, China, 2013

Meng Zhang, F. He, J. Lin, H. Ma and B. Zhu

O15.3. Outbreak of Adenovirus Infections in a Children's Ward -Johor, Malaysia, 2012: Nosocomial and Preventable?

Thilaka Chinnayah, H.A.S Badrul, N.C.M.D Shaharom, U. Noorhaida and K. Fadzilah

O15.4. Resurgence of Measles in the Cordillera Mountains – Northern Philippines, 2013

Paola Katrina G. Ching, M.J. Zapanta, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

O15.5. Bronchial Asthma Risk based on Distance from Lapindo Sidoarjo Mudflow Center of East Java 2012

Hermawan, H. Kusananto and Y. Djam'an

O15.6. An Outbreak of Legionellosis at a business centre in Kuala Lumpur

Rohani HJ Ismail, Normah S, Nurul H. MY, Norhaida U., Umami K.S. and Balachandran S.

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Session O16: Outbreak

O16.1. An Outbreak of Post Arthroscopic Melioidosis Knee Abscess in a Private Hospital –Selangor, Malaysia, 2012

Harishah Talib, A. Rosemawati, S. Rohani and K. Fadzilah

O16.2. Foodborne Salmonella Gastroenteritis Outbreak in an Islamic Boarding School—Pondok Ranji, South Tangerang City, Banten, Indonesia, 2012

Aprinianis RI Bay

O16.3. A Gastroenteritis Outbreak following a Village Feast—Temanggung, Central Java, Indonesia, 2013

Dwi Jumianto, M.A. Fahmi, C. Indriani, Masruchi and K. Muallim

O16.4. Foodborne Outbreak following a Circumcision Celebration - Sleman District, Yogyakarta, Indonesia, 2012

Lukman Fauzi and C. Heriana

O16.5 Second melioidosis case reported in Korea since the establishment of the national notifiable infectious disease

Woncheol Lee, G-Y Kwon and D. Kwon

Session O17: Zoonoses

O17.1. Risk factors for blue ear disease and preventive measures - Tam Ngai commune, Cau Ke district, Tra Vinh province, Vietnam, 2010

Tran Quoc Phong

O17.2. Human infection with avian influenza A (H7N9) virus associated with live poultry or related environmental exposure in Jiangsu, China, 2013

Yong Huang, D Ren, J Ai, C Bao, F Tang, G Shi and T Shen

O17.3. Epidemiology of human rabies - Vietnam, 2008-2012

Nguyen Thi Thanh Huong, H. Nguyen, T. Chu, Phu D. Tran and Hau V. Pham

O17.4. Inspection of risk factors for Fasciola spp. in cattle and buffaloes in Thua Thien, Hue province, Vietnam, 2010

Nguyen Thi Quynh Anh

Session O18: Food and waterborne diseases

O18.1. A large outbreak of E.coli O157 gastroenteritis caused by slightly salted pickled napa cabbages in nursing homes, Japan, 2012

Ayako Tabuchi, T. Wakui, T. Yamagishi, Y. Yahata, T. Sunagawa and K. Oishi

O18.2. Foodborne Outbreak following a Celebration in Semawung Hamlet, Indonesia, May 2013

Fatma Nuraisyah, M. Ali Hanafi, N.A. Ulfah, B. Rahayujati and B. Murtiningsih

O18.3. A Gastroenteritis Outbreak in an acrobatic training class Caused by Leftover Rice, Sichuan, China, 2012

Yajun Sun, X. Chen and L.J. Zhang

O18.4. Food Poisoning Outbreak following a Christmas Celebration at an Elementary School—Kediri City, East Java, Indonesia, 2012

Mohammad Ali Masudi, T. Trikuncoro, A. Fahrudda and T. Agung

O18.5. An Outbreak of Food Poisoning among School Hostel Students—Penang, Malaysia, 2013

Sunita Abdul Rahman, Rafidah MN, Bina Rai and Fadzilah K

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Plenary session: Updates on Zoonoses and One Health

Speaker: Dr Scott Newman

Panel Discussion on One Health

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Marlina M. Simbolon, Leny, M. Nuning, R. Djuwita, M. Adang, Evawangi and Rusyad

P03. An Investigation of a Suspected Noroviral Gastroenteritis Outbreak in a Small Village--Guangxi, China, 2012

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P04. An Investigation of Gastroenteritis Outbreak caused by Transient Polluted Drinking Water in a Village, Jiangsu Province, China, 2013

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P05. An Outbreak of Cholera due to Contaminated Spiced Beef in a Banquet-- Huangshi, Hubei, China, 2012

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P06. An outbreak of *E. Coli* Food Poisoning at Teluk Keke, Malaysia, 2012

Liza A. Latip, Balkis A. K., Mohd. J. and Anwa S.

P07. An outbreak of Shigellosis caused by contaminated food in a rural primary school, Sichuan, China, 2013

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P08. Prevalence and Antimicrobial Resistance of *Vibrio* spp. in Retail Shrimps - Hanoi, Vietnam, 2013

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P09. Food poisoning outbreak

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P10. Hepatitis A Virus (HAV) Outbreak in Nanggulan sub-district, Kulon Progo Regency, Indonesia, 2012

Theodola B. Rahayujati, C. Indriyani, Y.G. Chandra

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P12. Outbreak of Puffer Fish Poisoning – Kampong Chhnang Province, Cambodia, 2013

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P13. Prevalence and characterization of *Salmonella* on chicken meat from retail markets in Vietnam

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P14. Recent Trends of Food-borne Disease Outbreaks in Korea, 2007-2012: Which Pathogens and Foods?
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P15. A Gastroenteritis Outbreak Caused by Salmonella enteritidis Contaminated Food in Guangdong, China, 2013
Ming Zhao, G.J. Wu, Q. Huang, H.L. Ma

P16. An outbreak of Tetrodotoxin poisoning caused by consumption of marine Puffer Fish- Guangdong, China, 2012.
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P17. Determinants of sexually transmitted diseases in the Pematang Siantar City of North Sumatera
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P18. Effectiveness of harm reduction program among injecting female sex workers in select sentinel provinces in Viet Nam from 2010 to 2012
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P19. Risk factors incidence of sexually transmitted infections In the Women Indirect Sex Workers in Mataram City, Indonesia. 2012
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P20. Risk Factor Intrafamilial Transmission of Patients with HBsAg Positive in The Mataram City, Indonesia, 2011
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P21. Regional variation of Hepatitis C Virus Infection in Korea
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P23. Risk Factors Of Essential Hypertension In Young Adults In Banyudono Sub District, Boyolali District, Central Java Province, Indonesia 2011
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P24. Smoking in Public Venues Following Implementation of National Smoke-free Regulation, Nanjing, China, 2012
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P25. The Association between Overweight and Obesity and Hypertension in Shandong Province, China
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P26. The diet and nutritional status of children in Xuan Quang commune, Tuyen Quang province, Vietnam, 2012

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P27. Willingness for cervical cancer, breast cancer screening and associated factors for not willing among women attending Primary health centres in Villupuram district, Tamil Nadu, 2013

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P28. Awareness about cervical cancer and utilization of screening for cancer cervix among female health care workers in a semi urban district in Tamil Nadu, India 2013

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P29. Occurrence of gender-based domestic violence against women and supportive services for the prevention and control of domestic violence in Long An province, 2012

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P30. Children's Injury and Prevention in Mongolia

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Section 4: Nosocomial infections and antibiotic resistance

P31. An Outbreak Caused by Multi-drug Resistant Enterotoxigenic Escherichia coli among Neonates at a Maternal and Child Health Hospital--Sichuan Province, China, 2012

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P32. Case-case study on risk factors of recurrence and clustering of patients of Community-Associated Methicillin-Resistant Staphylococcus aureus (CA-MRSA) infections – Hong Kong, 2010-12.

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P33. An outbreak of nosocomial infection of salmonella stanley in a hospital-Henan, China, 2012

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P34. Prevalence of extended spectrum Beta-lactamase producing enterobacteria in healthy population, Ho Chi Minh City, Vietnam, 2013

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P35. A description of the epidemiological and genetic characteristics of human metapneumovirus (hMPV) among hospitalized severe acute respiratory infection (SARI) patients - Hai Duong, 2009-2011

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P36. Clinical manifestation and treatment outcome of HIV associated tuberculosis (HIV-Tb) by housing status

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P37. Evaluation of Tuberculosis Surveillance and Action Performance in Sarikei, Sarawak

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P38. Exclusive Breastfeeding Relationships Incidence Against Pneumonia Age 12 -23 months in Three Regions Public Health Center Cimahi City of West Java Province in 2012

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Abstracts of Oral presentations

Session O1: Outbreak

O1.1. An outbreak of Enterotoxigenic Escherichia coli (ETEC) associated with contaminated steel pipe well water in a rural community in Chengdu, Sichuan, China, 2013

Hui Chen, M. Wang, X. Zhou, L. Zhang and L. Liu

Background: On June 15, 2013, a township hospital in Sichuan reported more than 70 acute gastroenteritis patients within one week in this township. We conducted this investigation to identify the source of infection, risk factors and recommend control and prevention measures.

Methods: A suspected case was defined as onset of diarrhea (≥ 3 times/24 hours) during June 3-23, 2013 among villagers in this township. A confirmed case was a suspected case with a positive ETEC culture. We searched for cases by reviewing the medical records in the township hospital and interviewing villagers house by house. We interviewed 436 villagers in 96 households located along the river about the type of water they used for teeth-brushing and dish-cleaning. Stool specimens were collected from five patients for E. coli culture.

Results: 163 cases were identified (attack rate: 2.2%). The median age was 36 years (range: 7-80 years). The main symptoms included diarrhea (100%) and nausea (43%). The epidemic lasted 17 days indicating a continuing exposure. The attack rate among villagers supplied by steel pipe well water (27%) was higher than that among villagers supplied by running water (8%). The cases were distributed mainly along the river. In the retrospective cohort study, the attack rates were 21% among 273 villagers who used the steel pipe well water, and 8% among 163 villagers who used running water (RR=2.6, 95% confidence interval=1.5-4.6). Three of five stool specimens were ETEC positive. The water source of steel pipe wells was surface water. Sewage flowed into the river upstream.

Conclusions: This outbreak was likely caused by using steel pipe well water contaminated from the river. We recommended that the local government connect running tap water to all the villagers in this township.

Session O1: Outbreak

O1.2. Investigation of Hepatitis A Outbreak - Kulon Progo District, Indonesia, 2012

Henry Surendra, R.K. Harisaputra, D. Rosadi, S. Rahmah, Sugiarto and B. Murtiningsih

Background: In February 2012, the Health Department of Kulon Progo detected some hepatitis A cases in Nanggulan Sub District. There were no cases reported in previous years. We conducted an investigation to identify the risk factors for transmission and recommend control measures.

Methods: This was a community-based unmatched case-control study. Cases were persons diagnosed with hepatitis A based on rapid diagnostic test for IgM anti-HAV, during February to April 2012. Controls were persons diagnosed without hepatitis A, for the same period. Subjects were interviewed using a pre-structured questionnaire to obtain information on possible risk factors. Chi-square tests and logistic regression were done using STATA-12.1 software. We collected samples of water from some street food vendors and public water supply to identify coliform bacteria.

Results: There were 72 cases and 72 controls. Two of the cases were street food vendors who continued to sell food even when they were sick. The risk factors for this outbreak were consuming street food (OR=3.25; 95% CI=1.55–6.79), consuming raw vegetables (OR=2.79; 95% CI=1.19–6.55), sharing eating utensils (OR=2.59; 95% CI=1.22–5.52), and household contact with hepatitis A patients (OR=2.84; 95% CI=1.06–7.59). Laboratory tests indicated that the water from the street food vendors and public water supply had been contaminated with coliform bacteria.

Conclusions: This was probably a food borne outbreak with secondary transmissions in households. Some street foods could have been contaminated by sick food-handlers. We advised the public to avoid consuming raw vegetables and street food around the outbreak area. Sick persons should avoid sharing eating utensils with others and caregivers should wash their hands after caring for a sick person.

Session O1: Outbreak

O1.3. An Outbreak of Acute Gastrointestinal Illness Following Consumption of Hydrogen Peroxide-contaminated Noodles at a Junior High School — Taiwan, April 2013

Hsin-Chun Lee, W-C Chen, M-C Liu, S-E Huang, W-T Huang, Y-L Liu, D-S Jiang and Y-C Lo

Background: Hydrogen peroxide (H₂O₂), an oxidizing agent sometimes used as a food preservative, if ingested in small amounts, may cause gastrointestinal irritation. On April 2, 2013, acute gastrointestinal illness (AGI) after lunch occurred in >160 students at a junior high school. We conducted an investigation to identify the causative agent and possible food vehicle for this outbreak.

Methods: A case-control study using a questionnaire was conducted. Participants were recruited from classrooms with >6 ill students. Cases were defined as illnesses in students with any two of the four symptoms (nausea, abdominal pain/fullness, vomiting or dizziness) within 24 hours of eating school lunch on April 2; controls were those who ate the same lunch without developing symptoms. Human and food specimens were tested for common foodborne pathogens. Food samples were also tested for food additives. The school kitchen and food factory were inspected.

Results: There were 176 cases and 221 controls. The most common symptoms were nausea (81.8%), vomiting (58.9%), dizziness (43.8%) and abdominal pain/fullness (35.2%). The illness had a median incubation period of 0.7 hours (range, 0 – 13.3) and lasted an average of 5.4 hours (0 – 51.5). Eating noodles was associated with the presence of AGI (odds ratio [95% confidence interval], 12.5 [1.6 – 97.7]). Neither food nor human specimens tested positive for gastrointestinal illness-associated pathogens, but H₂O₂ was detected from two noodles samples, with a concentration of 528 and 531 ppm. Buckets of 50% H₂O₂ were found in the noodle factory.

Conclusions: The clinical presentations of illness, results of statistical analysis and laboratory testing are all consistent with eating H₂O₂-contaminated noodles. Tight control of food additives must be practiced to ensure food safety.

Session O1: Outbreak

O1.4. An Investigation of Acute Gastroenteritis Outbreak in an International Meeting, Ministry of Public Health-Thailand, 2013

Thanidtha Te-chaniyom, S. Wechwithan, N. Yimchoho, N. Sinanan, T. Imsuwanasi, Y. Xie, L. Voradetwittaya, S. Piriyaornpipat, S. Lai, J. Zhang and C. Jiraphongsa

Background: Participants from several countries reported gastrointestinal illness after attending the meeting of ASEAN+3 Field Epidemiology Training Network on January 28, 2013. We conducted an investigation to verify the outbreak, identify agent and source, and provide recommendations for prevention of similar outbreaks in the future.

Methods: We defined a suspected case as a person attending the meeting from 28 to 30 January with one of the following: vomiting, loose stool, watery diarrhea, mucous diarrhea or bloody diarrhea. We conducted descriptive and retrospective cohort study by collecting symptoms, time of onset, and food items consumed during two coffee breaks, lunch and dinner. Samples were collected from participants, cooks and ingredients and tested for enteropathogenic bacteria at Thai NIH. We used a sanitation check list to survey the food preparation site. Swabs of utensils and cooks' hands were tested with SI Medium, diet for detecting coliform bacteria.

Results: Sixteen cases were found from 73 (92%) respondents (attack rate 22%). Lunch was the only meal all cases consumed. Onsets of illness ranged from 5.5–44.5 hours after lunch. Chili paste consumption was strongly associated with illness (RR=5.72, 95%CI=1.38–23.75) and population attributable fraction (PAF) was 67%. Practices of food handlers included cook did not cover her head, containers for raw ingredients and cooked food were not separated. Foods were prepared 7.5 hours before serving. Coliform levels on various surfaces were positive 47% (8/17). We isolated *Aeromonas veronii*, biovar *sobria* from one of nine cases and leftover crab meat. Rectal swab cultures from food handlers were negative for enteropathogens.

Conclusions: This gastroenteritis outbreak might be caused by chili paste contaminated by crab meat through food processing. We recommended that the education and monitoring of cooks for banquets should be strengthened and different containers used for raw and cooked food.

Session 01: Outbreak

O1.5. Cholera outbreak in a Geographically Isolated Island in Mindanao with On-going Armed Conflict—Philippines, 2013

Remegio A. Javier, MJ Zapanta, VC de los Reyes, NM Sucaldito and EA Tayag

Background: After a heavy rainfall following a long dry season, increasing numbers of diarrhea cases were reported in an island in Mindanao with on-going armed conflict. A team was sent to confirm the outbreak and institute control and preventive measures.

Methods: An unmatched case-control study was done. A suspect case was a previously well resident of Bongo Island who had three or more watery stools per day with onset of illness anytime from April 1 to 11, 2013. Confirmed cases were those positive for *Vibrio cholerae*. We used a standard questionnaire during interviews. Stool and water samples were tested. We interviewed key informants and conducted an environmental survey.

Results: Sixty-six cases were identified. Two died (CFR=3%). Majority (52%) were male. Ages of cases ranged from 4 months to 45 years (median=3 years). The 1 to 5 year age group were most (58%) affected. Twelve (18 %) cases were positive for *Vibrio cholerae* O1 Ogawa El Tor. Water samples were positive for non-O1 *Vibrio cholerae*. On multivariate analysis and stratification by age and sex, cases were nine times more likely to have eaten anchovy (OR 9.38, 95% CI 1-48, p-value 0.008) than controls. Washing of hands after defecation (OR 0.114, 95% CI 0.02-0.5, p-value 0.006) was a protective factor.

Conclusions: An outbreak of cholera was due to the contamination of water sources and eating of anchovy. Poor sanitation and absence of safe water sources exacerbated the event. An armed-conflict area with poor sanitation is vulnerable to cholera outbreaks. Chlorination of water sources was done. Case management was enhanced. Improvement of sanitation and access to health care facility is necessary to prevent deaths.

Session O1: Outbreak

O1.6. Investigation of a Food Poisoning Outbreak during the Recitation Activity in Moyudan District, Sleman Regency, Yogyakarta, 2012

Cecep Heriana, L. Fauzi, B. Murtiningsih and A. Prasudi

Background: Food poisoning is a public health problem in Indonesia. During the years 1997-2001, there were 189 reported outbreaks of food poisoning. Sleman regency is one area that often experienced outbreaks of food poisoning. On January 4, 2012, a food poisoning outbreak occurred during the recitation activity in Sleman. An investigation was conducted to obtain information about transmission, source and risk factors for the outbreak.

Methods: A descriptive and retrospective cohort study was done. Ill subjects were people who consumed food derived from the recitation activity and had clinical symptoms of food poisoning. Healthy subjects were people who consumed food derived from the recitation activity, but had no clinical symptoms of poisoning. Statistical test used was Chi-square (bivariate).

Results: There were 89 food poisoning cases. The dominant clinical symptoms were diarrhea (86%), nausea (80.9%) and headache (77%). The shortest and longest incubation periods were 3 and 10 hours, respectively. The food with the highest attack rate (AR) was rice cake (92.3%). Statistical analysis showed that the risk factor related to the food poisoning outbreak was consuming rice cake (p-value: 0.03; RR: 1, 39). Laboratory result indicated that there were *Staphylococcus aureus* bacteria in rice cake.

Conclusions: Food poisoning outbreak was caused by rice cake which was contaminated by *Staphylococcus aureus* bacteria. Recommendations given to the rice cake producer were to have a separate cooking place and cleaning place of rice, store rice cake at normal temperature, and distribute rice cake as soon as cooked. We advised the health department to always monitor and train informal food producers on food hygiene-sanitation.

Session O2: Food and waterborne diseases

O2.1. An outbreak of Salmonella Typhimurium Gastroenteritis caused by contaminated food container in a School, Sichuan Province, China, 2013

Xingyu Zhou, L. Zhang and L. Liu

Background: On June 13, 2013, M district CDC in Sichuan province reported a gastroenteritis outbreak in a dormitory school which included kindergarten and grade 1-12. We conducted this investigation to identify the source of infection and risk factors.

Methods: We defined a suspected case as a student or school staff who had fever, diarrhea, nausea or vomiting anytime from June 10 to June 17. A confirmed case was a suspected case with a positive Salmonella culture. We searched for cases by reviewing medical records in hospitals and interviewing staff and students. We compared food exposures on June 12 between 81 case-students and 104 control-patients selected from grades 7 and 8.

Results: 401 cases were identified (399 students, 2 chefs). The attack rates were 23% in kindergarten, 46% in primary school, 40% in middle school, 0% in high school. The epidemic curve suggested a point-source. Students and teachers drank the same water. Teachers and high school students ate at different areas in the cafeteria compared to other students. In the case-control study, 85% of case-students ate cowpeas at lunch on June 12 compared to 59% of control-students (odds ratio=3, 95% confidence interval=1.3-7.8). The suspected cowpeas were stored in a 70cm-depth bucket which was used to hold raw meat sometimes. The chef cleaned it by water without disinfection. The cowpeas in the bucket were stored at room temperature for 3 hours before lunch. Six stool and one cowpea specimens were Salmonella Typhimurium positive and with the same PFGE.

Conclusions: This salmonella gastroenteritis outbreak was likely caused by cowpea due to cross contamination by the bucket. We recommended that the cafeteria use different buckets for holding raw and cooked food and store food appropriately.

Session O2: Food and water borne diseases

O2.2. Diarrhea Outbreak in Puhpelem Village, Wonogiri, Central Java, Indonesia, 2013

Sandi A. Primaherta, M. Syairaji, Widyastuti, R. Sholikhin, S. Heryanto and C. Indriani

Background: On May 12, 2013, a diarrhea outbreak in Puhpelem, a rural village in Wonogiri District of Central Java, was reported. An FETP team investigated to confirm the outbreak, identify risk factors and recommend control measures.

Methods: We did a matched case-control study. Cases were residents of Puhpelem village who had acute diarrhea anytime from May 6 to 16, 2013. Controls were previously well residents matched for gender. Subjects were interviewed using a standard questionnaire. Stool samples from cases and water samples from spring were collected for laboratory tests.

Results: There were 52 cases with ages ranging from 1-82 years (median 33 years). 50% were male. The epidemic curve showed continuous source outbreak. Signs and symptoms of cases included diarrhea (100%), fever (71.15%), colic (65.38%), weakness (63.46%), mucoid stools (46.15%), and stool with blood (21.15%). No bacteria were found in the stool samples. Risk factors included not washing hands with soap and water (OR 6.67, 95% CI: 1.98-22.43), and drinking turbid water (OR 3.5, 95% CI: 1.15-10.63). Distance between water tank and toilet of at least 10 meters (OR 0.46, 95% CI 0.22-0.96) was protective.

Conclusions: This diarrhea outbreak was probably caused by drinking water from contaminated water sources. We recommended that public water sources be chlorinated and residents should wash their hands before eating. Toilets should be constructed at least 10 meters away from water sources.

Session O2: Food and water borne diseases

O2.3. Associations between Antimicrobial Susceptibility Patterns of Shigella Isolates and Suspected Country of Acquisition - Victoria, Australia, 2008-2012

Courtney Renee Lane, N. Stephens, C. Walker, B. Sutton, J. Powling, M. Valcanis and J. Gregory

Background: Treatment of shigellosis is recommended to reduce bacterial shedding and ongoing transmission. Despite this, antimicrobial resistance to recommended antibiotics occurs and varies geographically. A study was undertaken to determine if antibiotic susceptibility patterns of Shigella isolates notified in Victoria, Australia could be differentiated by suspected country of acquisition.

Methods: Patients with shigellosis notified to the Victorian Department of Health between 2008 and 2012 were routinely interviewed to determine risk factors for infection. Their Shigella isolates were sent for characterization and antimicrobial susceptibility testing. Retrospective analysis excluded cases with incomplete country of acquisition or susceptibility results.

Results: Between 2008 and 2012, 519 instances of shigellosis were notified in Victoria. Amongst the 459 (88%) included in the analysis, antimicrobial resistance was most commonly seen against trimethoprim (425, 93%), sulphathiazole (394, 86%), streptomycin (387, 84%), tetracycline (345, 75%) and spectinomycin (253, 55%). Overseas contact or travel was reported by 249 (54%) patients, with Indonesia reported as a potential transmission source for 54 (12%) and India in a further 51 (11%). When compared to other travel related patients, Indian isolates displayed higher proportion of resistance against streptomycin (90% versus 78%; $p=0.047$), nalidixic acid (90% versus 17%; $p<0.001$) and ciprofloxacin (57% versus 6%; $p<0.001$). Between 2010 and 2012 all 32 isolates associated with travel to India displayed reduced susceptibility or resistance to ciprofloxacin. All Indonesian isolates retained full susceptibility to nalidixic acid and ciprofloxacin however 46 (85%) were resistant to spectinomycin, 24% higher than amongst other countries of travel ($p=0.001$).

Conclusions: Resistance to commonly used antimicrobials is high and differs between suspected countries of acquisition. This information should inform antimicrobial choices prior to receipt of individual sensitivity testing.

Session O2: Food and water borne diseases

O2.4. Resurgence of Cholera among T'boli indigenous people--Mindanao, Philippines, 2013

Ruth Alma A. Ramos, J.E. Ballera, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Background: An increasing number of confirmed cholera cases from the South Cotabato Provincial Epidemiology Surveillance Unit was reported to the National Epidemiology Center. An epidemiologic investigation was conducted to verify the diagnosis, to determine risks factors for the occurrence of the disease and to recommend prevention and control measures.

Methods: An unmatched 1:2 case control study was done. A suspect case was a previously well resident of Barangay Basag, T'boli who presented with acute watery diarrhea (three or more bowel movements per day) anytime from May 8 to June 3, 2013. Rectal swabs from cases and samples from water sources were sent to the national reference laboratory for bacterial analysis.

Results: There were 103 cases identified with two deaths (Case Fatality Rate = 2%). Three cases were found to be positive for *Vibrio cholerae* Ogawa El Tor. The eight water samples collected were negative for cholera. Risk factors were history of travel at least one week prior to onset of illness (OR=10, 95% CI=1-60, p value=0.01), taking care of a sick person (OR=18, 95% CI=1-223, p value=0.0238), not washing hands before eating (OR=6, 95% CI=2-41, p value=0.00) and having no toilet (OR=9, 95% CI=2-18, p value=0.00). Only 31% of households had toilets. There were leakages found in the pipelines.

Conclusions: The prompt response of the South Cotabato Provincial Health Office and T'boli Municipal Health Office led to the early control of the outbreak. To prevent the occurrence of another outbreak, the local waterworks should be rehabilitated with regular chlorination of the water supply. Sanitary toilets must be constructed and the health education campaign must be intensified.

Session O2: Food and water-borne diseases

O2.5. An Outbreak of *Vibrio parahaemolyticus* Infections Associated with Eating insufficient cooked crab in a Tour Group at a Coastal city-Guangdong province, China, 2012

Heng Zhang, Q. Huang, H. Liang, H. Liu, L. Ma and L. Deng

Background: From 2010 to 2011, there were nine *Vibrio parahaemolyticus* outbreaks reported with no implicated food confirmed in Zhapo-a coastal town in Guangdong province. In July 2012, a gastroenteritis outbreak occurred in a tour group in Zhapo. We conducted an investigation to identify the risk factors and source of contamination.

Methods: We defined cases from July 8-10 with diarrhea (≥ 3 times/24hr) or vomiting in a tour group member. We isolated enteric bacteria from rectal swabs, using PFGE to evaluate homology of isolates. We compared food exposure among 21 case-groups to 24 healthy control-groups randomly selected from the same tour group. We checked preparation of implicated foods.

Results: We found 21 cases (attack rate: 28%). Epi-curve indicated a point source outbreak. The only common exposure was that all tour-members ate lunch on July 8. 95% (21) of case-groups and 67% (24) of control-groups ate crab at that lunch (odds ratio [OR] =10, 95% confidence interval [CI]: 1.1-88). Of those eating crab, 80% of 20 case-groups ate more than 4 crabs compared with 20% in 16 control-groups (OR=6.5, 95% CI: 1.4-13). We isolated VP O3:K6 from 12 of 14 rectal swabs and one smear swab from plastic baskets holding raw crab. All isolates had the identical PFGE pattern. Leftover crab was not available. 3 kilograms of ~36 crabs were cooked together within 6 minutes.

Conclusions: This outbreak was likely caused by crab contaminated by a single strain of VP O3:K6. The fried crab was cooked for an insufficient time, permitting VP survival. We recommended enhancing training of kitchen workers on proper food procession. The gastroenteritis outbreaks in Zhapo have been reduced obviously in 2012 after implementation of these recommendations.

Session O2: Food- and water-borne diseases

O2.6. Foodborne Gastroenteritis Outbreak following a Village Feast—Temanggung, Central Java, Indonesia, 2013

Mohamad Anis Fahmi, D. Jumianto, B.S. Wiratama, Misinem, C. Indriani, K. Mualim and Masruchi

Background: On May 5, 2013, the Wonoboyo Public Health Center reported 80 diarrhea cases following a feast in Wates village. Since a food poisoning outbreak was suspected, an FETP team conducted an investigation to characterize the outbreak, determine the source and recommend control measures.

Methods: We did a 1:1 case-control study. Cases were those who attended the feast and developed gastrointestinal signs and symptoms afterwards. Controls were those who attended the same feast but remained well. Subjects were interviewed using a standard questionnaire. Data were entered into a computer and analyzed using EpiInfo7 software. Chi square tests and logistic regression were done. Left-over food samples were sent for laboratory testing.

Results: There were 112 cases. Fifty percent were male. Most (23%) cases belonged to the 30-39 years age group. Incubation periods of cases ranged from two to 34 hours (median 10). Signs and symptoms of cases were diarrhea (88%), colic (65%), headache (53%), abdominal pain (49%), weakness (38%), vomiting (28%) and fever (13%). Among the food items served, only tofu with chili (OR 2.10, 95% CI: 1.17-3.79) was associated with having gastroenteritis. No bacteria were detected in the left-over food samples.

Conclusions: The tofu dish was the probable source of this foodborne gastroenteritis outbreak. The dish may have been contaminated during food preparation or serving. The negative results from the laboratory could be due to improper sample collection and transport or a virus or toxin not tested by the laboratory could have caused the illness. We recommended that health center staff educate residents on safe food handling practices. Surveillance staff should also be trained on proper sample collection, storage and transport.

Session O3: Respiratory diseases

O3.1. Effect of Smoking on Sputum Conversion of Patients undergoing Treatment for Tuberculosis—Bogor District, West Java, Indonesia, 2011-12

Dimas Panduasa and S. Ronoatmodjo

Background: Tuberculosis (TB) is still a health problem in Indonesia. Sputum conversion in patients undergoing treatment for pulmonary tuberculosis is a sign of the success of the treatment and prevents the spread of the bacteria. Smoking has been associated with the occurrence of tuberculosis. This study aimed to determine the effect of smoking on sputum conversion of patients being treated for pulmonary TB.

Methods: This was a case-control study. Subjects were TB patients registered in a treatment center of Bogor district in 2011 to 12. Cases were patients whose sputums were still positive after two months of treatment (failed conversion). Controls were patients who had sputum conversion from positive to negative. Two controls were recruited for each case and selected by simple random sampling from the TB registry of the health center. Patients were interviewed and medical records reviewed. Data were analyzed using STATA11 software. Logistic regression was done to control for age, nutritional status, diabetes mellitus, smear grading, regularity of treatment, and exposure to combustion fumes.

Results: We had 213 subjects consisting of 71 cases and 142 controls. TB patients who failed to sputum convert were more likely to have been smokers prior to start of their treatment than those who converted (OR 4.9, 95% CI 1.6 to 14.5) and also more likely to be smokers at the time of treatment for tuberculosis (OR 13.8, 95% CI 4.6 to 41.0).

Conclusions: Smoking is associated with failure of sputum conversion among patients undergoing treatment for TB. We recommended that the health department educate the public on the ill effects of smoking and integrate smoking cessation in the treatment of TB patients.

Session O3: Respiratory diseases

O3.2. An outbreak of Influenza A (H1N1) virus in a remote Aboriginal community post pandemic— Kimberley region, Australia, 2013

Philippa J. Chidgzey, S. Davis, P. Williams and C. Reeve

Introduction: In March 2013 an increase in influenza like illness presentations was recorded by a clinic in a remote Aboriginal community (population 469) in Northern Australia. Laboratory tests confirmed the cause of the outbreak as pandemic Influenza A (H1N1). Remote Aboriginal Australians experience significant health inequality however the epidemiology of influenza in this population remains largely unknown. We describe this outbreak and focus on influenza risk for remote Aboriginal people and why this community was susceptible to H1N1, 4 years after emergence.

Methods: A confirmed case was defined as either laboratory test positive for H1N1 or temperature $>38^{\circ}\text{C}$ with cough and/or sore throat and a probable case as self-reported fever with cough and/or sore throat. Cases were identified from the clinic log and further information collected from medical records using a standardised questionnaire. Vaccination coverage and previous community cases of H1N1 were obtained from public health databases.

Results: From 27/2/2013 to 3/4/2013, 108 individuals met the case definition, giving a clinical attack rate of 23%. Under 5 year olds had the highest age-specific attack rate at 545 per 1000 population. Thirty cases (28%) experienced complications with 6 cases hospitalised. Only 7% of the community received influenza vaccination during the previous year. No cases of H1N1 from this community had previously been recorded.

Conclusion: To our knowledge this is the first description of the effect of what was essentially a new influenza strain on a remote Aboriginal community. Isolation and low vaccination are likely explanations for the apparent naivety to H1N1, and raise the possibility there are other communities remaining at risk. High attack and complication rates confirm that Aboriginal Australians should be considered a vulnerable group in pandemic planning.

Session O3: Respiratory diseases

O3.3. Nutritional Stunting and Tuberculosis among Children in West Bandung District, West Java, Indonesia

Jahiroh Jahiroh

Background: Tuberculosis (TB) remains a public health problem in Indonesia. It is estimated that 8.7% of TB cases are children aged ≤ 14 years. In West Bandung District, the prevalence of TB in children is 20%. The prevalence of nutritional stunting among children aged < 5 years is also high at 23%. This study was done to determine the relationship between nutritional stunting and TB among under five year old children in the district.

Methods: A case-control study was done. Cases were children aged one to 59 months who consulted at a clinic and were diagnosed to have TB. Controls were children aged one to 59 months who consulted at the same clinic without TB. Nutritional data were obtained by measuring the heights of the subjects. Stunting was defined as nutritional based height by age. Stunting criteria was z-score. Data were analyzed using Stata software. Logistic regression was done to control for confounding.

Results: Ninety-eight cases and 100 controls were included in the study. Children with TB were more likely to be stunted than controls (OR 2.96, 95% CI 1.29 to 6.73) and they were also more likely to be severely stunted (OR 8.18, 95% CI 2.36 to 28.29).

Conclusions: There is a significant relationship between TB and nutritional stunting in children. Nutritional stunting could lower a child's immunity and make the child more susceptible to acquiring TB. Untreated TB in children may also lead to nutritional stunting. To avoid this double burden, we recommend that the District Health Office improve TB case detection and treatment among children and inform mothers and guardians about the importance of proper nutrition to prevent stunting and decrease children's susceptibility to infections.

Session O3: Respiratory diseases

O3.4. Risk factors for human infection with avian influenza A (H7N9) virus in Zhejiang Province, China, 2013

Meng Zhang, F. He, J. Lin and H. Ma

Background: Human infection with novel avian influenza A (H7N9) virus occurred in 10 provinces in mainland China, 2013. From March 31 to June 30, a total of 132 confirmed cases were reported, including 43 deaths. 35% (46) of 132 H7N9 infection cases were reported in Zhejiang province. We conducted a case control study to identify the source of infection, mode of transmission and risk factors for the illness in Zhejiang province.

Methods: We enrolled 43 Zhejiang residents with confirmed H7N9 infection as cases. For controls we recruited 215 healthy persons through random digit dialing, individually matched to cases by age, sex and residence. We interviewed both persons in each matched pair by telephone within one week of case onset about various exposures to poultry. Using conditional logistic regression, all of the odds ratios were adjusted with a multivariable analysis.

Results: 79% (34/43) of cases visited live poultry markets compared with 41% (87/215) of controls (OR=5.5, 95%CI: 2.0-18). Among persons who visited live poultry markets, 50% (17/34) cases bought live poultry compared with 20% (17/87) controls (OR=8.0, 95%CI: 1.6-64). 8.8% (3/34) cases slaughtered live poultry compared with 3.4% (3/87) controls (OR=3.5, 95%CI: 0.18-49). 33% (14/43) cases' families raised poultry compared with 10% (22/215) of controls (OR=10, 95%CI: 2.2-62). Among the families that raised poultry, 79% of cases fed poultry compared with 45% of controls (OR=3.2, 95%CI: 0.44-8734).

Conclusions: Exposure to poultry in live poultry markets and raising poultry at home were main risk factors for H7N9 infection. We suggest closing live poultry markets during epidemic s of the disease and educating people to avoid backyard chickens to reduce the occurrence of H7N9 infection.

Session O3: Respiratory diseases

O3.5. Influenza A Outbreak among National Service Trainees--Melaka, Malaysia, 2013

Intan Azura Mhd Din, Noorhaida U, Shazelin AP and Fadzilah K

Background: Outbreaks of influenza-like illness (ILI) are known to be a health problem in the National Service Training Camp (NSTC) in Melaka. For the past three years, ILI outbreaks in NSTC accounted for 20% of all outbreaks in Melaka. On 24 February 2013, Putra Puteri NSTC reported that large numbers of trainees had symptoms of ILI. Immediate investigation was carried out to verify and describe the outbreak, identify risk factors and recommend control measures.

Methods: Active case finding and case control study were conducted. A case was defined as a trainee of Putra Putri NSTC who presented with high grade fever (axilla $>38.0^{\circ}\text{C}$ or oral $>38.5^{\circ}\text{C}$) within 48 hours and with any of the following symptoms: dry cough, nasal congestion/blockage, sore throat/irritation and myalgia from 9 February 2013 onwards. Controls were selected among the trainees who were asymptomatic. Environmental assessment included inspection of dormitories and classrooms.

Results: Thirty nine (39) cases fulfilled the case definition. Attack rate was 8.2% (39/475). Influenza A virus was detected in 80% of throat swabs collected. Those who were ill were 3 times more likely to have never heard of influenza for the past one year (OR 2.74; 95% CI 1.21-6.22). Contact with ill family members during Chinese New Year holiday and history of vaccination were not significant factors. Dormitory beds were too close to each other.

Conclusions: The ILI outbreak among the NSTC trainees was caused by Influenza A. Knowledge was the risk factor as knowledgeable individual will know how to protect oneself from getting Influenza infection. NSTC trainees' orientation activity should incorporate topic on control and prevention of Influenza A infection.

Session O3: Respiratory diseases

O3.6. The Influence of Therapy Adherence to the Conversions of Smear Positive TB Cases in Denpasar, Bali, Indonesia, 2012

Artawan Eka Putra | Wayan Gede and Pradnyadewi N.L.N.T.A

Background: Conversion rate is an important indicator in TB control because it shows the progress of therapy and decreased risk of transmission of smear positive TB cases. During the past five years, Denpasar, which has the highest case notification rate of smear positive TB in Bali, did not reach the minimum target of 80% conversion rate. This study aimed to identify the influence of therapy adherence to the conversions of smear positive TB cases.

Methods: This was a unmatched case control study conducted at Denpasar in 2012. Cases were smear positive TB cases that converted to be smear negative after two months of therapy and controls were those who did not convert. We excluded cases with TB-HIV co-infection and those without smear examinations after two months of therapy. Data was collected from TB registers (register TB-01 and TB-03) and bivariate analyses done.

Results: The study subjects consisted of 56 cases and 26 controls. The age and sex distributions of cases and controls were not statistically different. Most (91.1%) of cases adhered to the therapy, on the other hand, 53.8% of controls were adhered to the therapy. Furthermore the odds ratio of adherence to conversion was 8.7 (95% confidence interval: 2.3 - 36.1).

Conclusions: This study found that adherence to the therapy was a significant factor to support conversion of smear positive TB cases. A continuous program to increase adherence is needed, such as education and motivation programs for TB patients and increasing the performance of TB treatment observers.

Session 04: Non-communicable diseases

04.1. Determinants of Malnutrition among Toddlers in Rangkasbitung, Lebak District, Banten Province, Indonesia

Bakhtiar and R. Mahkota

Background: Malnutrition among children is still a problem in Indonesia. According to the Health Research, in 2010, about 13% of children were malnourished with 5% severely malnourished. We conducted a study to determine risk factors for malnutrition among children aged 24-59 months.

Methods: We did a case-control study. Cases were malnourished children who were diagnosed by a doctor or nutritionist and recorded at the health center monthly report in May 2013. Two controls were recruited for each case. Controls were children with normal nutritional status selected by simple random sampling. Data were analyzed using Stata 11 software. Chi-square tests and logistic regression were done.

Results: We had 105 subjects, 35 cases and 70 controls. The following were found to be significantly associated with malnutrition among toddlers: low birth weight (OR 7.56, 95% CI: 1.95-34.94); none or incomplete vaccination of infant (OR 5.04, 95% CI: 1.12-22.57); having an infectious disease (OR 3.06, 95% CI: 1.22-7.75); inadequate caloric intake (OR 11.09, 95% CI: 3.22-38.18) and inadequate protein in child's diet (OR 18.11, 95% CI: 3.78-86.64).

Conclusions: Inadequate protein in a child's diet, i.e. protein intake of < 80% RDA, was a major determinant for malnutrition. We recommended that the health department promote foods rich in protein for children and educate mothers and guardians on the need for children to have a nutritious diet. Health staff should periodically monitor the families in their catchment area and provide additional support for high risk families, i.e. those with inadequate food supply. Maintaining high infant vaccination coverage would also be helpful.

Session O4: Non-communicable diseases

O4.2. Prevalence, Awareness, Treatment and Control of Hypertension among Adults--Hubei Province, China, 2010

Tian Jing He, L. Zhang, Q. Zhang, S. Zhu, J. Pan and T. Shen

Background: Nearly 200 million people in China have hypertension– a major risk factor for heart disease and stroke. While national hypertension studies are available, studies at the provincial level, where control strategies are developed and implemented, are very limited.

Methods: We surveyed 3,600 adults (≥ 18 years), using a multi-stage stratified cluster random sample method that represented Hubei Province (population 60 million). We defined hypertension as systolic pressure ≥ 140 mmHg, or diastolic pressure ≥ 90 mmHg, or ever diagnosed by a physician; and controlled hypertension as < 140 mmHg systolic and < 90 mmHg diastolic.

Results: The prevalence of hypertension was 31.3% (95% confidence interval [CI] 29.4-33.2) and it was higher among men than women (34.3% and 28.2%, respectively, $p < 0.01$), lower in urban than in rural areas (26.6% and 33.6%, respectively, $p < 0.01$), and increased 2.1% for every 10 years increase in age ($p < 0.01$). Among the population with hypertension, the rates of awareness, treatment and control were 36.7% (95%CI 33.5-40.0), 29.6% (95%CI 25.5-32.6) and 17.4% (95%CI 15.1-19.8), respectively. Among those aware of their hypertension, 81.2% (95%CI 77.0-85.4) were treated with medications. Men were 13% less likely to be treated than women (86.7% and 75.7%, respectively, rate ratio (RR) 0.87; 95%CI 0.79-0.97). Among all those treated, the control rate was low (21.2%, 95%CI 16.7-25.6), and compared to those in rural areas, those in urban areas were 3.3 times more likely to be controlled (RR 3.28; 95% CI 2.0-5.3).

Conclusions: Hypertension is common in Hubei Province but awareness and control rates are low. Strategies to improve awareness and control are need across the entire population with a focus on rural areas.

Session O4: Non-communicable diseases

O4.3. Burden of retinopathy amongst self-reported diabetic patients attending rural public health facilities -- Kancheepuram, India 2013

Tony Fredrick, M. Murhekar, J. Yuvaraj, P. Kaur and R. Sudh

Background: In India, the prevalence of diabetes and its micro vascular complication, diabetic retinopathy, is increasing. Diabetic retinopathy is one of the main causes for avoidable blindness in the working age group. We investigated the independent associations between the stage of retinopathy and possible risk factors in self-reported diabetic patients attending rural public health facilities in Kancheepuram, India.

Methods: We conducted a cross-sectional survey among diabetic patients attending two rural public health facilities using convenience sampling. We did comprehensive eye examination, both by direct and indirect ophthalmoscopy following pupillary dilation and graded retinopathy using standard guidelines. We estimated systemic and ocular risk factors associated with retinopathy. Univariate and stepwise regression analyses were done to identify the independent risk factors associated with the presence and severity of diabetic retinopathy. We calculated adjusted odds ratio with 95% CI.

Results: We surveyed a total of 270 diabetic patients. The mean age of the study population was 54.5 (SD± 10) years and median duration of diabetes was 48 months. The prevalence of diabetic retinopathy was 30%. Factors associated with the presence of diabetic retinopathy were male gender, family history of diabetes, duration, poor drug adherence, fasting and postprandial blood sugar levels, hypertension and nephropathy. Multivariate analysis of risk factors independently associated after adjustment of age and gender were, hypertension [AOR: 3.8; 95% CI: 1.8-7.7], diabetes more than 5 years [AOR:5.3; 95% CI: 2.6-10.9], poor drug adherence [AOR: 1.8; 95% CI: 1.2-3.0], and nephropathy [AOR:2.5; 95% CI: 1.1-5.6].

Conclusions: Higher prevalence of diabetic retinopathy and associated risk factors were identified in the study population. We recommend periodic ophthalmic examinations for early detection of retinopathy, with counseling for strict adherence of drug intake, diet control and life style modification in the target population.

Session 04: Non-communicable diseases

04.4. Incidence and characteristics of unintentional non-fatal injuries: a community survey in the Central Highlands of Vietnam, 2013

Phan Thi Thanh Thao, Duoc T. Pham, Phu D. Tran, Lan T. Phan and Nguyen N. Tran Minh

Background: Injuries in the Central Highlands of Vietnam are one of the leading causes of death and place a great burden on the injured, their family and the community. This study was the first in depth community survey conducted to assess the incidence and characteristics of unintentional injury in the region.

Methods: A cross-sectional community-based survey using face-to-face interviews was done in May 2013. Cluster sampling with probability proportional to size (PPS) was used to enroll 748 households into the study. Data was analyzed using Epi Info.

Results: A total of 95 injuries were found in the 2,989 person-years giving rise to the incidence of 31.8 per 1,000 person-years. The rate of injury among males was 1.85 times higher than among females. The injury rate was highest in people aged 19-45 years (42.6%), with a secondary education (45.7%), farmers (53.2%), Kinh ethnicity (85.1%) and an annual income in 2012 less than 33.5 million Vietnamese Dong (62.8%). Only 54.7% of the injured had health insurance. Road traffic or transport-related accidents (42.1%) and falls (26.3%) were the main causes of the injuries. The injuries occurred most frequently during daily activities (45.3%) or working for income (13.7%). Forty four stayed in health centers for a total of 675 days. The injured people lost 2,896 days of work or school and needed 995 days help from 68 helpers. Approximately 436,108,000 VND (~20,768 USD) was spent on treatment in which 21,135,000 VND (~1,006 USD) (4.9%) was reimbursed by Vietnam Insurance company.

Conclusions: The injury prevention strategy in the community like the one studied here should direct interventions toward road traffic accidents and falls. More attention should also be paid to ensuring safer daily activities and work environments.

Session 04: Non-communicable diseases

O4.5. Association between Anger Expression and Incidence of Essential Hypertension - Kulon Progo District, Indonesia, 2013

Henry Surendra, D. Rosadi, Y.S. Prabandari and I.D.P. Pramantara

Background: Essential hypertension was the major non-communicable disease in Kulon Progo, with most cases found in Wates Health Center (45.9%). Anger was important in the development of essential hypertension. However, previous studies have yielded conflicting findings. This study was conducted to examine the relationship between anger expression (anger-in, anger-out and anger-control) and incidence of essential hypertension among men and women aged 18-60 years.

Methods: This was a community-based unmatched case control study. Cases were patients diagnosed with essential hypertension by physicians from January to June 2013. Controls were patients from the same health center with other diagnoses during the same period. Subjects of this study were 140 cases and 140 controls. Anger expression was assessed by Spielberger's Anger Expression Scale. Chi-square tests and logistic regression were done using STATA 12.1 software.

Results: Logistic regression analyses revealed that risk of essential hypertension was four-fold higher among men and women aged 18-60 years with low anger-out scores compared to those with higher scores (OR=3.94; 95% CI: 1.54-10.09). Risk of essential hypertension was 0.08 fold lower among men and women aged 18-60 years with high anger-control scores compared to those with lower scores (OR=0.08; 95% CI: 0.02-0.24). Moreover, anger-in was not associated with essential hypertension among men and women aged 18-60 years (OR=0.99; 95% CI: 0.57-1.75). These results have been adjusted by age, stress, physical activity, obesity and family history of hypertension.

Conclusions: This study showed that a low anger-out score was a risk factor for essential hypertension, while high anger-control may significantly decrease the risk of essential hypertension. Men and women aged 18-60 years should properly express out and control their anger to decrease their risk for essential hypertension.

Session O4: Non-communicable diseases

O4.6. Preliminary Results of an Investigation of a Beriberi Outbreak among Workers in a Factory in Phanom Sarakham, Chascheongsao Province-Thailand, July 2013

Nguyen Phan Ha Ai, C. Pittayawonganon, C. Jiraphongsa, H. Praekunatham, P. Thitichai, T. Shen, T. Soe and N. Lwin

Background: In July 2013, the Thai Ministry of Public Health received a report of four Myanmar workers who died from suspected beriberi at a factory. We conducted an investigation to confirm the diagnosis, identify the cause and provide control measures.

Methods: We conducted active case finding in Hospital-A and Factory-X. Suspect cases were Myanmar workers with at least two of the following: leg pain, tingling or burning sensation of extremities, extremity numbness, chest pain, leg edema, orthopnea, unable to elevate the leg, unable to walk; or diagnosed acute heart failure; during November 2012 to July 2013. A cross-sectional study was conducted among one-sixth randomly selected factory-X workers, to estimate prevalence of thiamine deficiency by thiamine pyrophosphate (TPP) level and risk factors. We collected food samples, inspected food preparation and menu and observed working areas.

Results: We found 17 suspect cases (attack rate 17%) (4/17). The median age was 26 years (range 18-57). All four deaths were young men (case fatality proportion 24%). Main symptoms were leg pain (71%), leg edema (53%), and extremity numbness (47%). Mean of cases' TPP was 172 ± 45 nmol/L. Two cases had abnormal TPP levels (TPP < 116 nmol/L). Prevalence of workers' thiamine deficiency was 17% (5/29), 95% CI=5.8-36%. Proportion of thiamine deficiency among Thai and Myanmar workers were 26% and 7%, respectively. We found that recently workload increased in this factory. However, food items were unchanged. Some laboratory results are pending.

Conclusions: This outbreak was likely caused by long exposure to low-thiamine intake. We recommended improving the ability of health workers to differentiate beriberi from other cardiomyopathy and neuropathy diseases at the hospital, give health education to increase the awareness of beriberi in all factories in this area. After providing thiamine supplement and improving their diet, no more cases occurred.

Session O5: Environmental & Occupation health

O5.1. Prioritization of Health Problems in Purbalingga District, Central Java in 2012 using the Hanlon Method

Bayu S. Wiratama, R. Abdurrahman, Semedi and D. Pramono

Background: Addressing health problems is important in the development of Purbalingga District in Central Java. Due to limited resources, the District Health Office (DHO) cannot address all health problems equally. We used the Basic Priority Rating System or Hanlon Method in prioritizing the health problems in the district as of 2012.

Methods: We collected data on the health problems in the district being addressed by the various health programs. The health problems were then ranked using the Hanlon Method in which each problem was scored according to the following criteria: magnitude and seriousness of the problem, effectiveness of available solutions and PEARL factors (propriety, economic feasibility, acceptability, resource availability, and legality).

Results: The thirteen health problems rated had scores ranging from 0 to 81.76 with six problems such as polio with a score of zero. The top five priority health problems were Dengue Hemorrhagic Fever with an incidence of 18/100,000 [score 81.76]; Acute Respiratory Infections including pneumonia [score 81.2]; Maternal Mortality of 146/100,000 live births [score 78], measles [score 72.8] and tuberculosis [score 60.48].

Conclusions: The Hanlon Method provided a means to compare different health problems in a relative framework, as equally as possible, and in a somewhat objective manner. The method was easy to apply and acceptable to health staff in the district. Based on the results of this prioritization exercise, in 2013 the DHO focused on health programs addressing the five priority health problems, e.g. vector control, immunization, antenatal care and safe delivery, diagnosis and treatment of dengue, pneumonia and tuberculosis cases, and information, education, communication campaign on these health problems.

Session 05: Environmental & Occupation health

05.2. Unusual microsporidial keratoconjunctivitis outbreak among international rugby players - Singapore, 2012

James Tan, P. Lee, Y. Lai, P. Hishamuddin, J. Tay, A. L. Tan, K. S. Chan, R. Lin, D. Tan, P. L. Ooi and J. Cutter

Background: On 18 May 2012, we were alerted by the Hong Kong Centre for Health Protection of a suspected outbreak of microsporidial keratoconjunctivitis involving 18 rugby players, who had participated in an international tournament held in Singapore on 21-22 April 2012. Epidemiological investigations were immediately conducted and we report herein on the findings and lessons learnt.

Methods: We worked with ophthalmologists, general practitioners and rugby clubs to interview all local cases identified through active case detection to obtain their clinical and epidemiological data. Corneal scrapings and soil water samples were collected and tested via microscopy using modified trichrome staining to detect the presence of microsporidial spore-like structures. Positive samples were then subjected to DNA extraction and PCR sequencing. In addition, we contacted team representatives of foreign rugby clubs and the respective national focal points (International Health Regulations) for information on participants.

Results: A total of 47 probable and six confirmed cases of microsporidial keratoconjunctivitis were reported. The attack rate was significantly higher among 'full-contact' (5.7%) than 'touch' (0.5%) rugby players ($p < 0.0001$). The median incubation period was 15 days (range 3–26 days). The mode of transmission was inadvertent exposure of eyes to muddy soil during the tournament. Microsporidia were detected from six corneal scrapings and 12 mud water samples. *Vittaforma corneae* was identified in four out of six corneal scrapings and one mud water sample.

Conclusions: This highly unusual outbreak in our tropical city state showed conclusively that microsporidial keratoconjunctivitis can be an important eye infection associated with outdoor exposures to mud. Public health professionals should consider this aetiology when investigating outbreaks of keratoconjunctivitis in countries where the mycotic agent may be prevalent.

Session O5: Environmental & Occupation health

O5.3. Analysis of the influence of childcare workers' infectious disease knowledge on kindergarten infectious disease cumulative incidence in 2011, Fengtai district, Beijing, China

Rui-ping Wang, M. Zhang, L. Cui, Q. Zhang, H. Ma and L. Zhang

Background: In recent years, infectious disease incidence in kindergartens has grown rapidly in China. The China CDC school hygiene office and education bureau of disease control offices have implemented various infectious disease knowledge education and training programs to boost kindergarten childcare workers' infectious disease knowledge. But it's uncertain whether the infectious disease knowledge can transform into healthy behavior and finally lower infectious disease incidence in kindergartens.

Methods: During December 2011, 327 childcare workers of 38 kindergartens in Fengtai district were selected by random cluster sampling and interviewed face to face. Information on infectious disease knowledge and healthy behavior were collected using a standard questionnaire and kindergarten infectious disease information was obtained from the China CDC Information System. We accounted for the complex survey design in the data analysis.

Results: The average infectious disease knowledge score of 38 kindergarten childcare workers was 80 (95% confidence interval [CI]:77-83), the average health behavior score was 77 (95% CI: 73-81), and the average kindergarten infectious disease cumulative incidence in 2011 was 4.1 per 100 person years (95%CI: 2.8-5.4). With the increase of infectious disease knowledge score, childcare workers' healthy behavior scores increased (Pearson $r=0.61$, $p<0.01$), and with the increase of healthy behavior scores, the kindergarten infectious disease cumulative incidence in 2011 decreased (Spearman $r=-0.43$, $p<0.01$). Their preferred methods for acquiring infectious disease knowledge were health lecture, special training, video and broadcast.

Conclusions: Conducting infectious disease knowledge education and training among kindergarten childcare workers is effective. Good infectious disease knowledge can improve healthy behavior and lower kindergarten's infectious disease incidence to some extent. Educational agencies and healthcare institutions should include infectious disease knowledge training and education in the future.

Session 05: Environmental & Occupation Health

05.4. Influence of Climate on Dengue in Ho Chi Minh City, Viet Nam, 2001- 2010

Hoang Quoc Cuong, Nguyen X. Ho, Vu T. Nguyen, Quang C. Luong, Huu N. Tran, Lan T. Phan, Hau V. Pham, Nguyen N. Tran Minh, and Khoa T. Dang

Background: Dengue is an emerging disease in Viet Nam. Ho Chi Minh City (HCMC), a highly urban city in southern Viet Nam. Many factors, such as host immunity, virus serotypes, vector density, population, urbanization and climate changes, affect the incidence of the disease. This study was conducted to determine the association between temperature, rainfall and humidity and dengue cases in HCMC, Viet Nam.

Methods: Monthly data on dengue cases were collected from the surveillance system of HCMC. Temperature, rainfall and humidity were recorded as monthly averages from the local meteorological offices. To determine the association between climate and dengue fever, Poisson regression analysis was performed with the monthly number of dengue cases as outcome. Humidity, temperature and rainfall were included as independent variables. The Poisson model parameters were implemented using the Generalized Estimating Equation approach; the Akaike information criterion was used to select the model.

Results: A total of 92,407 dengue cases were reported during 2001–2010. 51.7% of cases were reported during the rainy season (August–November). The risk of dengue occurrence was associated with increased rainfall (RR=1.05; 95% CI: 1.04-1.06 per 100 mm higher) and higher humidity (RR=1.17; 95% CI: 1.16-1.19 per 5% increase). The risk of dengue was inversely associated with temperature (RR=0.82; 95% CI=0.81-0.83 per 1oC increase).

Conclusions: Dengue is an important public health problem in Vietnam and tends to occur during the rainy season. In HCMC, temperature is inversely associated and humidity and rainfall are directly associated with dengue incidence. These patterns could be considered for predicting future dengue cases. Prevention and control of dengue in Vietnam should be enhanced during the rainy season.

Session 05: Environmental & Occupation health

O5.5. A Community-Based Case-Control Study on an Outbreak of Unknown Fatal Lung Injury in South Korea, 2011-2012

Ji-Hyuk Park, J. Gwack and S. Youn

Background: April of 2011, a university hospital reported an outbreak of unexplained adult cases related to pulmonary failure to the Korea Centers for Disease Control and Prevention (KCDC). The results from a hospital-based case-control study suggested that humidifier disinfectants (HD) might be the cause of these unexplained cases, but additional studies were needed to test that hypothesis. The cases had a nationwide distribution, and thus, this follow-up study was conducted to evaluate the phenomenon using a community control.

Methods: The data of 16 unknown fatal lung injury (UFLI) cases was offered from the hospital-based case-control study, and detailed information was obtained by interview. The community controls matched for age (± 3 years), gender, residence, and history of childbirth were investigated by the public health centers using a self-developed questionnaire. Additional telephone interviews of the community controls were performed by the researchers, as necessary.

Results: The median age of the cases was 36 years (range: 28-49) and female cases were 13 (81.3%). The cases occurred mostly in 2011 (10, 62.5%) and during spring (10, 62.5%). Humidifier disinfectants (OR=116.11, 95% CI: 6.53-2063.68) were significantly associated with UFLI. Among the variety of humidifier disinfectant agents, polyhexamethyleneguanidine phosphate (PHMG phosphate) containing products were implicated in a statistically significant manner. The OR for UFLI tended to increase according to the amount of HD containing PHMG phosphate used.

Conclusions: Temporal relationship, strength, and a dose-response relationship between HD and UFLI were identified in this study. In the prospective hospital-based monitoring since 2012, after the suspension of HD sale, there have been no reports of UFLI. To prevent similar outbreaks, strict regulations requiring sufficient product safety evidences must be in place and enforced.

Session 05: Environmental & Occupation Health

05.6. Investigation of a family cluster of nitrite poisoning--Suzhou City, Jiangsu Province, China, 2013

Rui-ping Wang, C. Teng, J. Zhang, N. Zhang, H. Liu and Y. Zhou

Background: In April 2013, a hospital in Suzhou City notified the authorities of a patient in a coma with nitrite poisoning as well as two family members with similar toxic symptoms five days prior. We investigated the event to identify the cause, source and possible route of contamination.

Methods: A case was defined as any person living in Yang Shan Hua Yuan community who has been diagnosed with cyanoderma with at least one other of the following symptoms: dizziness, headache, fatigue, tachycardia, drowsiness, nausea, vomiting, abdominal pain or diarrhea during April 15 to 25, 2013. Active case finding was conducted by interviewing community residents and reviewing medical records from local clinics; information was then retrospectively collected on the patient's food history, cooking procedures and food sources.

Results: We identified three nitrite poisoning cases, one male and two females, from one family. The interval time between dinner and onset was less than one hour. Retrospective survey showed sugar mixed asparagus on April 17 and stir-fried asparagus on April 21 to be suspected foods. Both suspected dishes had 'sugar' added, sourced from a clean-up of a neighboring rental house. Nitrite was detected in a vomitus sample, the 'sugar' and two leftover food samples.

Conclusions: This family cluster of nitrite poisoning resulted from the mistaken use of nitrite as sugar to cook dishes. We recommended that sodium nitrite be dyed with bright colors to prevent this mistake and that health departments strengthen food hygiene propaganda to alert the public about the dangers of eating unidentified food with an unknown source.

Session O6: Vector borne diseases

O6.1. Occurrence of Chikungunya and Dengue Coinfections in Western Visayas, Philippines, 2013

Ruth Alma A. Ramos, RJ Ventura, VC de los Reyes, MN Sucaldito and EA Tayag

Background: An increasing number of febrile illnesses with joint pains and rashes in Patnongon, Antique was reported by the Regional Epidemiology and Surveillance Unit to the National Epidemiology Center with a request for further epidemiologic investigation.

Methods: House to house case finding was conducted. An unmatched 1:2 case-control study was done. Environmental and entomological surveys were conducted. Serum samples were collected and sent to RITM for IgM Antibody tests by enzyme-linked immunosorbent assay (ELISA).

Results: There were 276 suspect Chikungunya cases identified. Females were mostly affected (57%). Ages of cases ranged from 4 months to 81 years (median = 26 years). The most affected age group was the 11-20 year age group. Fifty (56%) of the 90 serum samples were positive for Chikungunya IgM. Of the 50, seven (14%) were found to be positive also for Dengue IgM. Entomological survey revealed House Index of 42% and Breteau Index of 56%. Larvae identified were *Aedes aegypti* (38%), *Aedes albopictus* (59%) and *Culecines* (3%). Risk factors identified after multivariate analysis were the following: presence of discarded food and water containers (OR = 14, p-value= 0.00, 95% CI= 1.88 – 102.94) and presence of hallow fence posts (OR = 6, p-value = 0.01, 95% CI = 1.49 – 27.75). Wearing long pants was the protective risk factor identified (OR= 0.01, p-value=0.00, 95% CI= 0.0018 - 0.1075).

Conclusions: There was an occurrence of Chikungunya and Dengue co-infections in the municipality. The proliferation of the *Aedes* mosquitoes which are the vectors of the diseases was aided by the presence of several breeding sites. A community based local government unit vector control program was recommended to stop the spread of the diseases.

Session O6: Vector borne diseases

O6.2. Performance Evaluation of Plasmotec Malaria-3 in Detecting Plasmodium falciparum Infection: a Medical Record-Based Study in Mimika District, Papua, Indonesia, 2013

Fransisca Liony, K. Haripurnomo and K. J. Hari

Background: Approximately 45% of Indonesian people are at risk for malaria. Papua province has the second highest malaria annual parasite incidence (14 times the national average). In Mimika District of Papua, malaria must be excluded in all febrile cases. There should be evaluation on Plasmotec Malaria-3 (as rapid diagnostic test/RDT used in Mimika); due to its frequent use and absence of crosscheck examination with microscopy (as gold standard) in majority of cases.

Methods: Authors used medical records from Tembagapura Hospital and Kuala Kencana Clinic from randomly selected seven weeks in 2012 (17-23 February, 3-9 March, 29 March-4 April, 9-15 July, 1-7 August, 24-30 August, 24-30 October); with sample size of 260. Inclusion criteria: 1) subjective symptom of fever is present; 2) point of entry is emergency department; 3) RDT and microscopic examination results are available. Exclusion criteria: 1) no information about patient's symptom; 2) RDT shows pan-malaria or *P. vivax* infection only. Authors analyzed the sensitivity, specificity, positive predictive value/PPV, and negative predictive value/NPV of Plasmotec Malaria-3 using Stata-12.

Results: 58.85% samples were true positive, 1.92% false positive, 3.46% false negative, and 35.77% true negative. The odds ratio of parasite count $<200/\mu\text{L}$ blood give false negative, compared with parasite count $>200/\mu\text{L}$ blood is 4.52 (0.93-21.5; p -value=0.04). The performance values of Plasmotec Malaria-3: sensitivity=94.4% (89.7-97.4%); specificity=94.9% (88.5-98.3%); PPV=96.8% (92.8-99%); NPV=91.2% (83.9-95.9%); slide positive ratio=62% (56-68.2%); ROC=0.947 (0.919-0.975); prevalence=62%.

Conclusions: This study showed that Plasmotec Malaria-3 has lower specificity and NPV (when used in Mimika) compared to what is reported by its manufacturer. Plasmotec Malaria-3 can be adequate screening test or RDT; but not as replacement for gold-standard examination. Authors recommend that health facilities in Mimika continue or start using microscopic thick and thin blood smears as gold-standard examination for malaria.

Session O6: Vector borne diseases

O6.3. Surveillance of Hosts and Vectors of Plague in a Plague Endemic Area in Vietnam

Nguyen Le Manh Hung, D. Dang, Hau V. Pham, Lan T. Phan, N. Tran Minh and Long Vu

Background: Plague remains a public health threat in endemic countries because the disease has high outbreak potential and can easily spread. Until the beginning of the millennium, plague outbreaks have occurred in the Central Highlands. From 1997 to 2002, the region reported 95% of plague cases. Therefore, surveillance on hosts and vectors of plague is critical for prevention and control in this region.

Methods: A cross-sectional study analyzed surveillance data to describe the characteristics of hosts and vectors of plague at two communes in Gialai province, and two communes in Daklak province. 100 traps were set in each commune and in 33 randomly selected households in these communes on three consecutive nights every quarter. *Yersinia pestis* was tested by microbiological culture method from liver and spleen of rodents and fleas; fleas were collected from trapped rodents in accordance with WHO guidelines.

Results: Mean rodent density was 6.28 (SD: 2.81, range: 3-16); mean flea index was 0.71 (SD: 0.41, range: 0-1.8). The dry season was characterized by relatively high rodent density and higher flea index when compared to the rainy season; rodent density (95%CI: 1.5-4.2, p-value<0.05); flea index (95%CI: 0.31-0.67, p-value<0.05). *Yersinia pestis* was not detected in rodents and fleas. Rodent species: (*Rattus exulans* (65%), *Suncus murinus* (31%); other species included *Rattus nitidus* and *Rattus argentiventer*, flea species: (*Xenopsylla cheopis* (98%); other species included *Pulex irritans* and *Ctenocephalides felis felis*).

Conclusions: The data suggest plague prevention and control program must conduct more spraying and extermination of rodents and fleas during the dry season when the rodent densities and flea indices are relatively high. The main host may be *Rattus exulans* and main vector may be *Xenopsylla cheopis* in the Central Highlands.

Session 06: Vector borne diseases

06.4. Falciparum Malaria Outbreak in a Low Transmission Area—Penampang, Sabah, Malaysia, 2012

Saffree Jeffree Mohammad and O. Mihat

Background: Malaria incidence in Penampang is 0.05/1000 population, the lowest among the districts in Sabah. On June 26, 2012, a health clinic reported two malaria cases from K village. Investigation started immediately to identify the risk factors associated with the outbreak and institute control measures.

Methods: All 79 houses in the village were visited to search for cases. A case control study with 1:4 ratio was conducted. Both cases and controls were interviewed using a self-administered questionnaire. A case was defined as any person in K village with malaria parasites in blood smear with or without symptoms whereas a control had negative blood smear results. The microscopic examination and entomology sampling were carried out by trained technicians. Data were analyzed using SPSS for frequency distribution and analytical calculation of risk estimation (OR and 95% CI).

Results: Eleven of 470 persons met the case definition. Nine were detected from active case finding and one died of cerebral malaria. The incidence was higher among those aged 11-20 years, male, and worked as rubber tappers. The outbreak started on 28 May 2012 and slowly peaked a month later. The odds of cases living near stagnant water was seven times more than controls (OR: 7.3, 95% CI 1.2-43.5). All cases were positive for Plasmodium falciparum with gametocyte rate of 55%. Anopheles balabacensis mosquitoes were detected. Stagnant water and buffalo's footprints contained mosquito larvae. Rubber cultivation activity, increased commodity price and government subsidy had created influx of foreign workers for land clearing.

Conclusions: This Plasmodium falciparum malaria outbreak was due to imported parasites from foreign workers and introduced to the community via Anopheles balabacensis. Passing near stagnant water bodies was the risk factor. Integrated vector management, screening, social mobilization and campaign have been instituted. Cooperation is needed from agriculture authority and land owner to prevent future outbreaks.

Session O6: Vector borne diseases

O6.5. Chikungunya Fever Outbreak in Western Visayas, Philippines, 2013

Ray Justin C. Ventura, P. Ching, VC de los Reyes, MN Sucaldito and EA Tayag

Background: On April 30, 2013 the National Epidemiology Center received a report of increasing numbers of suspect Chikungunya cases from Western Visayas. A team was sent to conduct an epidemiologic investigation.

Methods: An unmatched case-control study was done. A case was a previously well individual from Kabankalan City who developed fever and joint pains with any of the following: rash, joint swelling and headache from February 27 to May 8, 2013. Samples were collected and sent to the national reference laboratory for Chikungunya IgM testing.

Results: There were 96 suspect Chikungunya cases. Ages of cases ranged from 2 to 78 years (median: 31); 63% were male. Fifty-nine percent were positive for Chikungunya IgM antibody. The number of cases increased two weeks after a heavy rain. The index case had a history of travel to another city with suspected Chikungunya cases. Entomological survey revealed the House Index for Aedes larvae was 63% (Normal $\leq 5\%$) and a Breteau Index of 178% (Normal $\leq 20\%$). Risk factors were being female (OR 7; 95% CI 1.52–30.39; $p=0.00$), having uncovered containers in the house (OR 41; 95% CI 3-52; $p=0.00$), deep well as water sources (OR 16; 95% CI 3-90, $p=0.00$) and not wearing long pants (OR 9; 95% CI 1-63; $p=0.02$).

Conclusions: This was the first recorded Chikungunya outbreak in Western Visayas. The existence of laboratory-confirmed cases with high vector indices in a favorable environment due to the heavy rains contributed to the rapid increase in the number of Chikungunya cases. Local health officials spearheaded the community clean-up, larviciding on stagnant waters and information and education campaign.

Session 06: Vector borne diseases

O6.6. Efficacy of artemisinin-based combination therapies in the treatment for uncomplicated falciparum malaria – Central Vietnam, 2007 – 2011

Huynh Hong Quang, T. Trieu, C. Nguyen, G. Li and Y. Song

Background: Malaria is a major public health problem in Vietnam. To reduce drug resistance to *Plasmodium falciparum* (Pf), an artemisinin-based combination therapy (ACT) was introduced for Pf resistance in areas where chloroquine and mefloquine resistance have been reported. As the efficacy of ACT has not been evaluated, and Pf resistance to artemisinin has been recently reported, we conducted a study to evaluate the efficacy of ACT for uncomplicated Pf malaria.

Methods: From 2007 to 2011, all confirmed uncomplicated Pf malaria cases aged 6-59 months were enrolled from five communes in Quangtri, Ninhthuan, and Gialai provinces. Patients were treated by ACT comprising dihydroartemisinin (40mg) and piperazine (320mg). Early treatment failure (ETF), late clinical failure (LCF), late parasitological failure (LPF) and adequate clinical and parasitological response (ACPR) were evaluated over a 42-day follow-up period. Polymerase chain reaction (PCR) analysis was used to differentiate reactivation from new infection.

Results: A total of 521 cases participated, of which 42 were lost to follow-up and two withdrew. Proportions of ETF and LCF were 3.4% and 1.7%, respectively. After treatment, 17% of blood smears were positive with Pf on or after day 3. The PCR analysis showed a cure proportion of 100% in all sites, except for one in Gialai at 95%. No moderate to severe side effects were reported.

Conclusions: The efficacy of ACTs in these studies was extremely high and side effects were mild. However, proportion of asexual positive with Pf on/after day 3 in Gialai sentinel was above 10% as indirect resistance marker and possible widespread. Hence, ACTs resistance should be monitored in and surrounding areas.

Session 07: Food- and water-borne diseases

07.1. A Gastroenteritis Outbreak Caused by Norovirus genogroup II in a Primary School, Jiangsu Province, China, 2012

Liangliang Cui, J. Ai and T. Shen

Background: Norovirus has been the leading cause of non-bacterial gastroenteritis outbreaks in China in recent years. On 24 October 2012, a primary school physician reported several students with vomiting and nausea in Jintan city, Jiangsu Province.

Methods: We defined a suspected case as students and staff in this school with \geq two of the following symptoms: vomiting, nausea, abdominal pain and diarrhea between October 18 and 31, 2012. A confirmed case was a suspected case with throat swabs, rectal swabs or vomitus found positive for Norovirus by RT-PCR. We selected 24 patients and 24 asymptomatic controls matched by gender and class to compare their behaviors of water drinking and personal hygiene. The distribution of cases from the class with most cases was described by illness onset and spatial distribution. 27 cases' specimens were collected for laboratory test.

Results: The attack rate was 3.6% (65/1,789), all cases were students. 25% of 24 cases drank water using somebody else's cup compared with 0% of controls (MH-OR 95% CI 1.3-8734); 37% of 24 cases washed their hands after using the toilet compared with 63% of 24 controls (OR=0.22, 95%CI: 0.063-0.79); 30% of 24 cases washed their hands with soap compared with 70% of 24 controls (OR=0.21, 95%CI: 0.061-0.07). Spatial distribution of cases by temporal sequence of illness onset indicated spatial cluster of cases around a case who vomited in the classroom. Two vomitus, three throat swabs and 17 rectal swab specimens were Norovirus genogroup II positive.

Conclusions: This outbreak was caused by Norovirus genogroup II, human-to-human transmission was the main transmission mode, and students' bad hygienic behaviors likely helped sustain the outbreak. We recommended strengthening quarantine and helping students develop good hygienic behaviors.

Session 07: Food and water borne diseases

07.2. Spatial Analysis of Environmental Determinants of Acute Diarrhea among Children aged 5-14 years in Kulon Progo District, Yogyakarta, Indonesia, 2011

Ratna Wijayanti, M. Juffrie and L. Lazuardi

Background: In Indonesia, diarrhea remains a public health problem. Most research on diarrhea among children has focused on those under five years old with little studies done on older children. In Kulon Progo District, during the past three years, diarrhea was more common among children over five years old with most cases due to bacterial infections. We conducted a study to determine the relation of population density, environmental sanitation, topography and amount of rainfall on diarrhea incidence among children aged five to 14 years in Kulon Progo District.

Methods: Spatial analysis using GeoDa software was done to examine the relationship between acute diarrhea incidence among children aged 5-14 years in 2011 with village population density, availability of latrines and potable water sources, village altitude, amount of rainfall and ownership of cattle sheds. Data on diarrhea incidence and environmental sanitation were obtained from the district health office, while topography, population and weather data were obtained from demography and agriculture departments.

Results: Results of spatially weighted regression analysis (spatial error model) showed that high population density was associated with high incidence rate of acute watery diarrhea ($p=0.0067$) but not for dysentery ($p=0.9887$). Very low and very high amounts of rainfall were also associated with a high acute diarrhea incidence rate. Latrine coverage, availability of potable water supplies, cattle shed ownership and altitudes were not determinants of acute diarrhea incidence.

Conclusions: Population density coupled with water scarcity due to inadequate rainfall or contaminated water sources due to flooding are associated with high incidence of acute diarrhea. During times of drought and flooding, it is important to supply village residents with sufficient amounts of clean water for their daily needs.

Session 07: Food and water borne diseases

07.3. Paralytic Shellfish Poisoning: Implications of Absent Red Tide Monitoring in a Mussel Farm - Visayas, Philippines, 2013

Paola Katrina G. Ching, R.A. Ramos, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Background: On July 2, 2013 the National Epidemiology Center was notified of a Paralytic Shellfish Poisoning outbreak in Tarangnan, Samar, well known for its mussel farming. A team conducted an epidemiological investigation.

Methods: A matched for age case-control study was done. A suspect case was any individual residing in Tarangnan who developed any motor, sensory or gastrointestinal symptoms from June 29-July 4, 2013 after a meal. A confirmed case was a suspect case positive for saxitoxin in urine or blood. Rectal swab, blood and urine samples, seawater and mussels were tested for saxitoxin.

Results: There were 31 cases with 2 deaths (CFR=6%). Ages of cases ranged from three to 59 years (median: 58); 61% were male. Implicated green mussel *Perna perna* was harvested from the local shores of Cambatutay Bay. Mouse Bioassay result showed 225ugSTeq/100 gm green mussel meat. Cases were twice more likely to be male (OR 2, 95% CI 1-6; p=0.05), four times more likely to harvest their own food (OR 4, 95% CI 2-9; p=0.03), eight times more likely to eat raw mussels (OR 8, 95% CI 2-27, p=0.00); five times more likely to have eaten at least 15 pieces of mussel (OR 5, 95% CI 1-18, p=0.01), eight times more likely to have taken at least one cup of mussel broth (OR 8, 95% CI 2-21, p=0.00) and 15 times more likely to have taken carbonated drinks (OR 15, 95% CI 3-56, p=0.00) than controls.

Conclusions: There was a Paralytic Shellfish Poisoning outbreak in Tarangnan, Samar. There was no existing seawater toxin monitoring prior to the incident. A sampling station was established and surveillance started. A collaborative multi-sectoral effort is necessary to address the burden of the social and economic impact of red tide.

Session 07: Food and water borne diseases

07.4. A Cluster of Sudden Unexplained Deaths Associated with Newly Established Toxic Mushroom, *Trogia venenata*—Sichuan, China, 2012

Ming Zhao, W. Yuan, Y. Gao, Z. Feng and G. Shi

Background: In July 2012, a cluster of sudden unexplained deaths (SUD) was reported from a remote mountain village in Sichuan, China. We investigated this incident to characterize the illness, identify the etiology and risk factors, and recommend control measures.

Methods: We defined SUD as sudden onset of serious unexplained physical impairment followed by death within 24 hours in the village residents between January 1 and July 25, 2012. A suspected survivor had onset of similar symptoms and signs (e.g. unconsciousness, vomiting) without death. We interviewed witnesses of SUD and suspected survivors to identify exposures to potentially toxic substances. We compared exposure histories among all members in affected-families. We also selected 18 control-families and compared their exposure with affected-families.

Results: We identified five SUDs including 4 females and 1 male with a mean age of 29 years (range: 1-44) and one suspected survivor (male, 4 years) in three families in the village. Onset was from July 23 to 25, 2012. All five of the deceased were previously in good health and suddenly developed unconsciousness (4) or difficulty breathing (1) and died two minutes to 12 hours later. The attack rate (AR) was 33% in affected-families. All six case-persons ate a newly established toxic mushroom, *Trogia venenata*. The AR in 10 family members exposed to the mushroom was 60% compared to 0% in other eight family members. 100% of three affected-families had exposure to the mushroom compared to 5.6% of 18 control-families.

Conclusions: This cluster of SUD was associated with consumption of *Trogia venenata*, which caused clusters of SUDs in neighbouring Yunnan province. We recommend extending previously successful measures in Yunnan to Sichuan to prevent reoccurrences of this problem.

Session 07: Food and water-borne diseases

07.5. An outbreak of gastroenteritis among workers at a large canteen – Binh Duong, Vietnam, 2012

Vo Huu Thuan, D. Nguyen, P. Nuorti, L. Le, Lan Trong Phan and Nguyen Nhu Tran Minh

Background: On 10 July 2012, an outbreak of gastroenteritis occurred among workers of company X after eating lunch. Meals for workers were provided by a catering company at a large canteen. Of 430 workers attending the meal, 56 were hospitalized with abdominal pain, diarrhea, vomiting and nausea, according to initial report. We conducted an investigation to identify the vehicle and source of the outbreak.

Methods: We conducted a case-control study. Cases and controls were interviewed by using standard questionnaire. A case was a worker attending the meal and hospitalized with acute gastroenteritis. Catering facilities and food-handlers were inspected. Food samples from catering service were tested at reference laboratories. We used logistic regression to calculate adjusted odds ratios (aORs) for the consumption of food items.

Results: Of hospitalized cases, 54 fulfilled the case definition, but no specimens were available; 72 controls were randomly selected from non-ill workers. Of four food items served during lunch, only “Soup of pumpkin and minced pork” was significantly associated with gastroenteritis: aOR=9.5 (95% CI 3.2, 27.7). The caterer did not separate cooked from raw foods, using the same counter for both. Cooked foods were kept in room temperature about 3.5 hours before serving. Four out of fourteen food-handlers were not trained on basic food safety principles and did not have health certificates.

Conclusions: Although no microbiological confirmation was obtained, our epidemiologic investigation suggested that “Soup of waxy pumpkin and minced pork” caused the outbreak. Hospitals should be instructed to obtain specimens of patients with gastroenteritis. Food-catering services should be educated in basic food safety measures.

Session 08: Zoonoses

08.1. Surveillance of Avian Influenza H7N9 virus in poultry in the North of Vietnam, 2011 – 2013

Nguyen Van Long, T.D. Nguyen, T. D. Hoang, N.T. Nguyen, H.D. Do, L. Loth, S. Newman and V.D. Pham

Background: On 31 March 2013, China reported that avian influenza (AI) H7N9 virus was detected in Chinese patients. By 30 May 2013, WHO reported a total of 132 laboratory-confirmed human cases, including 37 deaths. The north of Vietnam shares a long border with China, with daily human and animal cross border movements. These activities pose a high risk of introducing H7N9 virus into Vietnam. This study was conducted to investigate H7N9 presence in poultry in Vietnam.

Methods: From September 2011 to April 2013, a total of 8,464 pooled samples were collected from poultry at 268 live bird markets (LBMs) in 125 districts in 30 provinces; of these samples 1,234 were positive for Influenza- A and were additionally tested using Real-time RT-PCR to detect H7N9 virus in May 2013. In addition, a total of 7,650 samples (1,530 pools of five individual chickens) were collected and tested by Real-time RT-PCR to detect H7N9 virus between June and July 2013 at 60 LBMs in nine Northern provinces. These provinces were identified as high risk areas for H7N9 virus introduction because of their proximity to China.

Results: None of the samples tested positive for Influenza-A subtype H7N9 virus. However, of the 7,650 prospective samples, 323 (29.3%, 95% CI 26.7 – 33.0%) samples were positive with influenza type A virus. Influenza type A virus was detected in 42/60 LBMs (70.0%, 95% CI 56.8 – 81.2%).

Conclusions: Avian influenza H7N9 virus has not been detected in poultry in Vietnam. Surveillance of AI H7N9 virus in poultry at LBMs is critical to early detect this zoonotic threat. Timely warning of virus detection in poultry will aid the public health sector to respond and avoid human infections.

Session 08: Zoonoses

O8.2. Prevalence of *Taenia saginata* Infection among Raw Beef Lawar Consumers in Sukawati District, Gianyar, Indonesia, 2012

Dewa Oka Harimbawa, S. Sawitri and N. Adiputra

Background: Research indicates that taeniasis and cysticercosis is endemic in Bali (0.4-23% prevalence) with increasing trend found each year. Previous research in Gianyar regency indicated that taeniasis prevalence was 23.8%, with the highest prevalence found in the sub-district of Sukawati. This high prevalence is partly influenced by the community practices and a culture of raw beef consumption in this area.

Methods: This research used a combination of quantitative and qualitative methods. Quantitative data was collected through cross sectional analysis of 80 samples of raw beef consumers (interviews on risk behaviours and past experience). Fecal samples from these respondents were also taken and examined for *Taenia saginata* infection. Qualitative data was collected through participatory observation and in-depth interviews with raw beef food stall owners.

Results: The research findings indicated that the highest percentage of *Taenia saginata* infection was found predominantly in the 15-44 years age group, among males and those who did not have a high level of formal education. Bivariate analysis indicated that the most significant factors were gender ($p = 0.018$), location of food stall ($p = 0.001$) and respondent's lawar consumption frequency ($p = 0.013$). Multivariate analysis using Cox regression methods found that the location of food stall had a significant correlation with the occurrence of *Taenia saginata* infection ($p = 0.003$). Sukawati district has a high prevalence of *Taenia saginata* infection (11.25%).

Conclusions: Recommendations include education for raw beef providers and more testing of consumers, and further research into other variables such as livestock slaughter behaviors and meat preparation protocols.

Session 08: Zoonoses

08.3. A Survey on Residents' Knowledge, Attitudes, and Practices on Rabies and Dog Profile of a Suburban Municipality East of Manila, Philippines, 2013

Luis M. Sy Jr., M.C. Roces, M.E. Miranda, A. de Guzman, R. Javier, M. Zapanta, J. Ballera, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Background: The Philippines ranked 5th in terms of prevalence in the World Health Organization's rabies list with an estimated 200-300 deaths/year. The Department of Health set a goal for a rabies-free Philippines by 2020. To help achieve this goal, we conducted a survey among residents of Cainta, a municipality east of Manila, and a Community Against Rabies Exposure (CARE) project site of the Global Alliance for Rabies Control (GARC), to assess their needs, establish a human and dog community profile, and to recommend control and preventive measures to lay the groundwork for a rabies elimination program.

Methods: A cluster survey was conducted. A standard household questionnaire was used to interview respondents. An animal welfare assessment form was used for any dogs seen in the cluster whether owned or stray.

Results: Three-hundred households from five villages were interviewed. Median household size was five (range=1-12). Overall, 31% of households (92) own a dog. The dog to human ratio was 1:10. Dog bite incidence was 3%. Majority (85%) was aware of rabies, yet majority (92%) still wants more information about rabies. There were 39 (13%) households with recent history of dog bites, 90% of households were aware of anti-rabies vaccine and 96% were willing to be vaccinated, however, only 36% sought treatment and were given post-exposure prophylaxis. Of the 146 dogs seen, 86% were owned with median age=18 months (range=1 month-12 years), 59% were vaccinated; however, only 29% were registered.

Conclusions: Cainta is at risk of acquiring rabies due to a high dog to human ratio and dog bite incidence. Recommended strategies include targeted educational campaigns specifically in schools, mass dog vaccination and control of stray dogs.

Session 08: Zoonoses

O8.4. Swine Influenza viruses, a zoonotic threat with pandemic potential - Vietnam, 2013

Nguyen Ngoc Tien, C.T. Nguyen, V.T. Le, K. Inui, L.T. Ngo, L. Loth, D.V. Pham, T. T. Nguyen and S. Newman

Background: Globally, pigs are known to host a wide range of Influenza viruses and are considered mixing vessels for these viruses, with the potential of recombination of genes to new strains. These new strains can be transmitted to humans and have the potential to cause human pandemics, as Influenza A, subtype H1N1 did in recent years. This study was conducted to detect and characterize Swine Influenza viruses (SIV) in pigs in Vietnam in order to better understand their potential risk to humans.

Methods: From January till July 2013, a total of 3,600 nasal swabs and 720 blood samples were collected from pigs on 60 farms in the south and north of Vietnam. At local laboratories the samples were analyzed by PCR and ELISA techniques, virus isolation was attempted on positive samples.

Results: From a total of 60 farms, pigs on 26 farms tested serologically positive for SIV, indicating past or present infection. Ten farms returned positive PCR tests for influenza A. Virus was isolated from five farms and characterization showed subtypes H3N2 and H1N2.

Conclusions: Swine avian influenza viruses circulating on Vietnamese farms pose a risk to infect humans, especially those in close contact with pigs. Possible concurrent infection with seasonal influenza viruses or Highly Pathogenic Avian Influenza (H5N1) may result in new virulent strains with human pandemic potential. Routine SIV surveillance in pigs should be conducted to predict and prevent such events.

Session 08: Zoonoses

08.5. Re-emerging Zoonotic Disease: Alarming Increase in the number of Human Rabies Cases in Cagayan Valley Region, Philippines, 2013

Ray Justin C. Ventura, J. Velasquez, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Background: On June 17, 2013, the National Epidemiology Center (NEC) received a report of increasing numbers of suspect rabies cases in Isabela Province. A team was sent to conduct an epidemiologic investigation.

Methods: A descriptive study of rabies cases in 2013 was done. An unmatched (1:3) case-control study was also conducted. A case was a previously well individual from Cagayan Valley Region who developed acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic syndromes (dumb rabies) that progressed towards coma and death from within 7 to 10 days after the first symptom from January 1, 2011 to June 28, 2013.

Results: There were 19 cases from January to June 28, 2013. Their ages ranged from one to 73 years (median: 51). Majority (74%) were male. The most (47%) affected age group were those 41 to 60 years old. After multivariate analysis, risk factors were distance from nearest Animal Bite Treatment Center of more than 15 kilometers (OR 53, 95% CI 3-910, $p=0.00$), monthly family income of less than 5,000 pesos (OR 78, 95% CI 3-1855, $p=0.00$), bitten by a stray dog (OR 21, 95% CI 1-342, $p=0.03$). Protective factors were knowledge of the mode of transmission and prevention of rabies infection (OR 0.02, 95% CI 0.001-0.330, $p=0.00$) and having received Post-exposure Prophylaxis (OR 0.01, 95% CI 0.00-0.18, $p=0.00$).

Conclusions: Multiple factors brought about the alarming increase of human rabies cases in the region. With the Philippines gearing towards canine-mediated human rabies elimination by the year 2020, it is imperative that the risk factors be addressed. Establishment of dog pounds, targeted IEC campaigns, increasing the number of Animal Bite Treatment Centers and ensuring continuous supply of post-exposure prophylaxis must all be prioritized.

Session 09: HIV-STI

09.1. Factors associated with Mortality among HIV-infected Adults receiving Antiretroviral Therapy in Khanh Hoa, Viet Nam

Ton Nu Hong Vy, T.V. Tran, R. Miller, H.T. Do, Lan T. Phan, Phu D. Tran and P. Vapattanawong

Background: A primary reason for the decline of deaths from HIV/AIDS is the expansion of accessibility to Antiretroviral Therapy (ART). However, Khanh Hoa still has the highest percentage of deaths (24.5%) within the first 12 months of ART in the central region. Understanding factors associated with mortality among PLHIV receiving ART is needed in this province.

Methods: The data was obtained from the study “Evaluation of ART Results among HIV/AIDS Patients in Khanh Hoa”, a prospective clinical-based study from 2004 to 2011, conducted by the Khanh Hoa Preventing AIDS Center. Cox proportional hazard regression models were used to test the association between survival and socio-demographic, baseline clinical, and treatment factors.

Results: Selected for the study were 441 PLHIV at least 15 years old. During a mean follow-up time of 4.95 years (902.80 person-years), 27.4% of PLHIV had died (Median survival time 7.1 years). Patients with a spouse were at lower risk of dying compared to those who lived alone [HR: 0.63; 95% CI: 0.42– 0.93]. Patients with baseline BMI of at least 18.5 were less likely to die compared to those with lower BMI [HR 0.59; 95% CI (0.40– 0.86)]. Ambulatory and bed-ridden status showed an increased risk of death [HR 1.85; 95% CI (1.06-3.23); HR 2.9; 95% CI (1.33-6.32)]. Patients who had changed their initial ART regimen were less likely to die [HR 0.23; 95% CI (0.13– 0.40)]. Adherence to ART was significantly associated with decrease in the risk of mortality [HR 0.68; 95% CI (0.47-0.98)].

Conclusions: The identification of basic prognostic indicators, including BMI and functional status are critical before widespread ART. The ART program should evaluate and facilitate patient adherence support mechanisms from medical staff, family, and peer educators. Couple-based approaches enlisting partner support may help PLHIV to prolong survival. The timely review and selection of appropriate therapy regimen are an essential part of routine clinical procedures.

Session 09: HIV-STI

O9.2. Generating HIV Estimates data using Spectrum software, India, 2012

Chinmoyee Das, U. Jha, Y. Raj, S. Venkatesh, A. Pandey, D. Sahu and T. Bakkali

Background: HIV prevalence in India is low, concentrated among high risk groups (HRG) and has different sub-national epidemics. To assess intervention impact and plan for health-care needs, it is difficult to directly measure incidence and prevalence. The 'HIV Estimations-and-Projections 2012', was undertaken by Department of AIDS Control in collaboration with ICMR, UNAIDS, CDC and WHO, to generate state-specific and national HIV incidence, prevalence and mortality estimates for understanding epidemic patterns for programme intervention.

Methods: Spectrum software with inbuilt Estimation-Projection-Package was customized with Indian data to allow separate State-wise projections. Inputs included Surveillance data from HRG and antenatal clinic (ANC) attendees, demographic data and program statistics. HIV prevalence trends were plotted for each sub-population by fitting epidemiological curve for site-specific surveillance data. State-specific estimates with uncertainty bounds were generated for relevant indicators for the past and future years. For general population estimates, certain assumptions like calibrating ANC prevalence curves were used.

Results: During 2001-2011, estimated adult-prevalence declined from 0.41% to 0.27%; total PLHIV declined from 23.5 lakhs to 20.9 lakhs; and adult new-infections declined from 2.4 lakhs to 1.2 lakhs. Estimated AIDS-related-deaths declined from 1.94 lakhs to 1.5 lakhs during 2004-2011. Declining trends were noted in high-prevalence states. Eight low-prevalence states showed rising incidence-trends among ANC despite low-level epidemic among HRG. Some northern States showed rising trends among injecting drug users (IDU) in recent years.

Conclusions: HIV-Estimations-2012 indicated an overall reduction in adult prevalence, new infections and AIDS-related-deaths. Further evidence is needed to find if decline in prevalence and AIDS-related-deaths are due to scale up of program interventions. There is a need to analyze and understand dynamics of HIV epidemic in low-prevalence states showing rising incidence trends.

Session 09: HIV-STI

09.3. HIV Sentinel Surveillance of HIV prevalence and access to health services among men who have sex with men in Viet Nam

Bui Hoang Duc, T. Duong and H. Phan

Background: HIV sentinel surveillance system (HSS) in Viet Nam began to collect behavioral data, in addition to biologic information, from men who have sex with men (MSM) in four provinces in 2010, and expanded to eight provinces in 2012. These data provide a better understanding of risk behaviors among MSM who are considered a high-risk group in Viet Nam. This study aims to estimate HIV prevalence and coverage of health services among MSM.

Methods: Cross-sectional surveys were conducted in each province with participants selected based on geographic mapping exercise by peer educators and local health staff. In addition to testing for HIV, thirty behavioral questions were used to interview MSM.

Results: A total of 1,009 and 1,960 MSM were sampled in 2010 and 2012 respectively. HIV prevalence among MSM was 6% vs. 1.3% in 2010 and 2012 respectively. Among drug-injecting MSM, HIV prevalence was 11.1% and 9.7% in 2010 and 2012 respectively. MSM receiving free condoms, needles/syringe in the last month were 39.8% vs 45.5% and 36.9% vs 40.7%, in 2010 and 2012 respectively. MSM screened for sexually transmitted infections in the last three months were 13.2% vs. 23.7% in 2010 and 2012. The proportions of MSM reporting being tested for HIV and receiving their results were 20.7% and 45.3% in 2010 and 2012, respectively.

Conclusions: HIV prevalence was high among drug injecting-MSM. Access to health services among MSM has increased but is still at low levels. Access to HIV prevention should be expanded with some emphasis on drug injecting-MSM.

Session O9: HIV-STI

O9.4. Risk behaviors and Case Detection among HIV-infected Pregnant Women Living in High HIV-prevalence Areas in China

Ya Ping Qiao, L.W. Fang and L.H. Wang

Background: Prevention of HIV infection among women of childbearing age is the first prong of the global comprehensive strategy on Prevention of Mother-to-child Transmission of HIV (PMTCT) issued by the World Health Organization and UNAIDS. Examining risk behaviors among HIV-infected pregnant women living in high prevalence HIV/AIDS areas in China can provide important evidence for developing preventive measures to reduce HIV infection in women of childbearing age.

Methods: HIV-infected pregnant women living in a relatively high HIV prevalence area were interviewed using structured risk behavior questionnaires during October 2006 to September 2010.

Results: All 931 HIV-infected pregnant women (median age 28 ± 5.7 years) reported from six counties (four provinces) were interviewed. Overall, 68.7% were infected with HIV through heterosexual behavior, 14.5% by blood transmission, 16.8% didn't know the transmission routes. During the study time frame, the proportion of women infected through heterosexual behavior increased from 62.1% to 74.8% (linear regression $\beta=6.577$; $p<0.05$). Most (61.8%) became aware of their HIV-positive status through testing during ANC, while the remainder (38.2%) became aware through other medical care. Among the risk behaviors: 50.3% had sex with HIV-infected husbands or boyfriends, and 24.4% had multiple sexual partners. The proportion of women who had multiple sexual partners increased from 14.6% to 20.8% (linear regression $\beta=5.029$; $p<0.05$).

Conclusions: Heterosexual transmission was the main route of infection among HIV-positive pregnant women. Screening heterosexual partners in high risk areas and ANC screening are both critical elements to control HIV transmission. There is a need to improve the awareness of prevention of HIV infection among women of childbearing age and to advocate for them to practice safe sex, especially those whose sexual partners have high risk behaviors.

Session O9: HIV & STI

O9.5. HIV – HBV – HCV situation among intravenous drug users in Central Vietnam, 2012

Do Thai Hung, D. Nguyen, H. Le, M. Trinh, V. Ton, L. Yoshida, C. Bui, Phu D. Tran and K. Ariyoshi

Background: High HIV prevalence and common Hepatitis B and C co-infections among intravenous drug users (IDU) has been reported in Vietnam. The prevalence may vary among regions. However, there is very limited information on HIV, HBV and HCV infection among IDU in the central region of Vietnam. The objective of this study is to investigate the HIV prevalence, HBV and HCV co-infection, high risk behaviors (sharing needle, not using condom and multiple sex partners) among IDU in central Vietnam.

Methods: A cross sectional study was conducted from June to September 2012 and recruited 1,100 IDUs (based on mapping data) from five provinces in central Vietnam (Quang Tri, TT. Hue, Da Nang, Khanh Hoa and Binh Thuan provinces). A structured questionnaire was administered to collect data on socio-demographic characteristics and risk behaviors. Serum was then collected from each participant and tested for the presence of HIV antibody, HB surface antigen (HBsAg) and anti-HCV antibodies.

Results: The average age of the IDUs was 29 years; 58.3% were unmarried. HIV prevalence among IDU in central Vietnam was 3%, lower than 2012 report for northern and southern regions of Vietnam (16% and 10% respectively). A reported 96 % and 80 % IDU used clean needles in the last injection and in the last one month respectively. IDU with over three years of drug-injection history have higher HIV positive rate (3.92 % vs 1.20%, $p < 0.05$). Among HIV-positive IDU, 79%, 17% and 17% were positive for HCV, HBV and with both HBV/HCV respectively.

Conclusions: HIV positivity rate among IDU in central Vietnam was lower than those in northern and southern Vietnam. High HBV, HCV co-infection rate was observed and over three year history of IDU was associated with higher HIV positivity rate.

Session O10: Food and water borne diseases

O10.1. *Vibrio parahaemolyticus* Enteritis Outbreak following a Wedding Banquet in a Rural Village – Kampong Speu, Cambodia, April 2012

Vandy Som, L. Som, P. Has, J. Denny and M.C. Roces

Background: Foodborne outbreaks are common in Cambodia, but only few investigations to document the etiology and source are conducted. In April 2012, we learned of 49 acute diarrhea cases in a village following a wedding banquet. An investigation was conducted to identify the pathogen, source and mode of transmission.

Methods: We interviewed banquet hosts and food handlers to obtain the menu and list of wedding guests. Guests were asked about signs and symptoms, onset of illness, time of meal and food or drinks consumed. Rectal swabs were taken from 13 cases for culture. A case-control study was conducted; cases were guests who had acute diarrhea within three days after the wedding, controls were guests who remained well during the same time period.

Results: There were 256 guests, of whom 69 were interviewed (52 cases, 17 controls). Aside from diarrhea, the 52 who reported illness (attack rate 75%) had abdominal pain (94%), vomiting (48%), nausea (42%) and fever (25%). Incubation periods ranged from seven to 51 hours (median 16.5). Rectal swabs from three cases grew *Vibrio parahaemolyticus*. Among the food and drinks served, vegetable salad with raw octopus was the only item associated with illness (OR 6.31 95% CI 1.25-36.06, $p=0.01$). The octopus was chopped into small pieces and mixed with fresh vegetables. The dish remained unrefrigerated and was served during a four hour period.

Conclusions: The investigation identified vegetable salad with raw octopus as the vehicle for transmission of this *Vibrio parahaemolyticus* enteritis outbreak. Messages regarding the risks from eating raw seafood were disseminated to the community. Food handlers were advised to cook seafood to high temperatures. Efforts to improve foodborne disease surveillance in Cambodia are being undertaken.

Session O10: Food and water borne diseases

O10.2. Outbreak of water-borne typhoid fever attributed to a contaminated well in a rural junior high school in Hunan province, China, 2013

Jun Ling Sun, H. Zhou, J. Zhang, H.L. Ma and F.Q. Liu

Background: From June 19-25, 2013, the Chinese notifiable surveillance system revealed six suspected typhoid fever cases from a rural junior high school in Hunan, China. We conducted this investigation to identify the source, the mode of transmission, and develop control measures.

Methods: We defined a probable typhoid fever (TF) case as one with onset of fever ($\geq 38.0^{\circ}\text{C}$) for \geq three days between May 19 to July 20, plus \geq two of the following: persistent headache, diarrhea, abdominal pain, constipation, rose spots, relative bradycardia, hepatomegaly, or splenomegaly and a student or employee of the school. A confirmed TF case was a probable case with *Salmonella enterica* serovar Typhi isolated from stool or blood. We compared exposures to school water and food between 74 cases and 144 controls (randomly selected asymptomatic students, frequency-matched by classroom). We evaluated the school water supply.

Results: From May 19 to July 20, 8.1% (84) of 1,041 students developed TF, no cases in 91 teachers ($p=0.003$). Seventy-three cases and 144 controls drank water directly from the school taps. Unlike students, only 13.2% (12) of 91 teachers drank tap water. The OR increased six-fold as tap water drinking increased from 1 to ≥ 4 per day ($p=0.003$; χ^2 for trend). Sixty-nine percent of cases drank bottled water compared with 87% of controls (OR=0.32, 95%CI: 0.16-0.65). The well is located in the vegetable fields and the peasants usually fertilize the vegetables using feces from the school. Two TF cases studied in school during the possible exposure period. They represented the probable source of the organism.

Conclusions: This TF outbreak was possibly caused by contaminated water supply system. We recommended that the school strengthen disinfection, surveillance of potable water indices, and supply students with boiled water.

Session O10: Food and water borne diseases

O10.3. Food Poisoning Outbreak in a Refugee Camp in Central Java, Indonesia, 2011

Lalu H. Hutomo, F. Mansur, T. Wibowo and S. Darojah

Background: On April 14, 2011 Magelang District Health Department received a report from a health center that there was an outbreak of food poisoning in a refugee camp. A large number of people developed diarrhea, fever and vomiting. An FETP team was sent to investigate and control this outbreak.

Methods: A case-control study was conducted with 83 cases and 83 controls. Interviews were performed using structured questionnaires. Cases were defined as persons who developed illness on 14-17 April with diarrhea (defined as three loose stools within a 24 hour period). Controls were selected from the same refugee camp but did not develop symptoms during the same timeframe. Data collected included demographic characteristics, date of illness onset, and food eaten during lunch on 12 April 2011. Food samples were taken for laboratory tests. Data were analyzed using logistic regression.

Results: Of the 565 refugees, 83 of them developed symptoms including diarrhea (100%), fever (52%), vomiting (36%). Eating the lunch served on April 12 was associated with illness [Odds ratio (OR) 28.7; 95% confidence interval (CI) 16 – 93.5]. Consumption of salted eggs was associated with illness [Attack rate (AR) 83%, OR: 28.7; 95% CI: 16– 93.5]. Consumption of salted fish was not associated with illness [OR: 0.74; 95% CI: 0.16 – 3.4]. From laboratory samples tested, salted eggs were contaminated with fungus/mold *Aspergillus* sp.

Conclusions: There was a food poisoning outbreak in a refugee camp. The source of the outbreak was found to be salted eggs contaminated with fungus/mold *Aspergillus* sp. We recommended to camp managers to increase supervision of the food distributed in the refugee camp including the types of food and expiration dates.

Session O10: Food and water borne diseases

O10.4. Outbreak of *Vibrio parahaemolyticus* gastroenteritis traced to contaminated hard-boiled eggs – Singapore, 2012

Pream Raj Sinnasamy, Q.Y. Pang, P. Hishamuddin, J. Tay, P.L. Ooi and J. Cutter

Background: In April 2012, the Singapore Ministry of Health was alerted through multiple informants of cases (including eight who were hospitalized) in an outbreak of gastroenteritis among customers of a popular local food-stall. Investigations were immediately conducted to determine the extent and source of infection, and mode of transmission.

Methods: Our investigations comprised case interviews, site inspection and interviews, and microbial testing of stool samples, and food and environmental samples. Through active case finding, clinical and epidemiological information, including detailed food history, were obtained from all cases. On-site evaluation of personal and food hygiene practices was conducted at the implicated food-stall.

Results: We identified 27 cases with symptoms of watery diarrhea (100%), vomiting (82%), abdominal pain (52%), fever (30%) and nausea (4%). Median incubation period was 7 hours (range, 4-17 hours). Twenty-five (93%) of them had consumed hard-boiled eggs. Eight (30%) were hospitalized, and their stool samples showed *V. parahaemolyticus*. Of five isolates serotyped, four were identified as O3:K6 and one was O1:K32. Twenty (74%) *V. parahaemolyticus* serotype O2: K (untypeable) and *E. coli* were found in the hard-boiled eggs. We found that the food-stall licensee had washed the de-shelled eggs in the same sink that was used to clean raw seafood and meats.

Conclusions: Our investigations pointed strongly to the food-stall as the source of the outbreak, and to hard-boiled eggs as the vehicle of transmission. This was substantiated by the finding of *V. parahaemolyticus* in the hard-boiled eggs, a probable result of cross-contamination during washing of de-shelled eggs in the same sink used to clean raw seafood. This outbreak highlighted the importance of strict adherence to good personal and food hygiene practices in food-stalls and kitchens to prevent food-borne outbreaks.

Session O10: Food and water borne diseases

O10.5. Outbreak of *Escherichia coli* gastroenteritis at a Boarding School--Samarahan, Sarawak, Malaysia, February 2013

Julaidah Sharip, N. A. Rahim and S. Syukuri

Background: At 12.30pm on 7 February 2013, the Samarahan District Health Office received a notification of a food poisoning outbreak that occurred at a boarding school. An outbreak investigation was carried out to determine the causative agents and the contributing factors to ensure that appropriate control and preventive measures can be implemented.

Methods: A case was defined as someone who had dinner on 6 February 2013 at the hostel kitchen and presenting with symptoms of food poisoning such as diarrhea, abdominal pain, vomiting and nausea. A case control study was done. Case and control subjects were interviewed using the standard form (FWBD/KRM/BG/001). Environmental samples were taken including tap water, swabs from food handlers and kitchen utensils. The premise was inspected for adequate food storage facilities, appropriate food preparation areas and sanitation practices.

Results: There were 30 cases (attack rate 5.79%). Cases were from 1 students who had dinner late on 6 February 2013. Based on the food history, cooking process and statistical analysis the suspected food was honey dew (OR 34.45, 95%CI 12.86 - 92.32) and chicken "rendang" (OR 7.79, 95%CI 2.95 - 20.63). The water supply to the kitchen has zero residual chlorine and the pipeline was placed in the drain. Various bacteria were found from the environmental samples such as *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and coliforms.

Conclusions: The factors that caused this food poisoning outbreak were water contamination due to faulty pipe system and zero residual chlorine. It was aggravated by improper food preparation and long holding times. Close monitoring by school authority and adherence to food safety are important to prevent a similar outbreak in the future.

Session O10: Food and water-borne diseases

O10.6. Investigation of Diarrhea Cases in Subdistrict Dlingo, Bantul, Yogyakarta, Indonesia, 2012

Nooria Sukmaningtyas, D. Eliana, B. Murtiningsih and T. B. Santasa

Background: On May 4, 2012, there were 41 diarrhea cases reported to Bantul district health office from a weekly report. There was a suspected diarrhea outbreak in Dlingo II, Bantul district. The aims of this study were to verify the existence of the outbreak, to describe source and transmission of the outbreak and risk factors affecting the outbreak.

Methods: A descriptive study and an unmatched case-control study were done. Cases were all patients with major clinical symptoms (diarrhea, stomach ache, vomiting, nausea) living in Dlingo. The controls were people living in the same neighborhood and who didn't show any symptoms. Data collection was conducted by using a questionnaire to interview the respondents.

Results: There were 41 cases and 41 controls in this investigation. Majority of cases were male (25 cases; 60.98%), 27% (11 cases) were aged 0-4 years. The incubation periods ranged from 1-3 days. From the analytical study, the habit of not properly boiling water (OR=3.4; 95% CI: 1.12-11.25) was statistically significant. But the habits of respondents to not wash their hands before eating (OR=2.6; 95% CI: 0.94-7.29) and not to do hand-washing with soap after defecation (OR=2.3; 95% CI: 0.85-6.62) were not statistically significant. Laboratory testing of the water source showed *Aeromonas hydrophila*.

Conclusions: A risk factor for this outbreak was not boiling water using the right method. We recommended that the people in Dlingo be advised to boil their water the right way. They should be educated on how to boil water.

Session 011: Vaccine preventable diseases

011.1. A Measles Outbreak in Serdang Bedagai District, Indonesia, 2012

Frans Yosep Sitepu, R. Rangkuti, A. Fahmi and Nirwana

Background: Measles is a highly contagious, serious disease caused by a virus. In January 2012, a measles outbreak was reported in Kuala Lama Village, Serdang Bedagai District. An epidemiological investigation was conducted to identify the risk factor and recommend control measures.

Methods: This was an observational study with case control design. A suspected case was a resident of the village who had onset of fever and rash. A confirmed case was a suspected case with measles-specific IgM identified in the serum. Door-to-door visits were conducted. Controls were neighbors of cases. The study used bivariate and multivariate analyses with chi-square and logistic regression. Odds ratio (OR) was used to determine risk factors.

Results: We interviewed 83 cases and 85 controls. Twenty out of 83 suspected cases were laboratory confirmed. The mean age of cases was 20 years; children aged 5-9 years had the highest attack rate (48.19%). 53% of confirmed cases were female. The index case-patient had onset at end of December 2011 when he arrived from another district. The multivariate analysis showed that lack of vaccination (OR: 3.21 95% CI: 1.41-9.72), contact with measles cases (OR: 1.21 95% CI: 1.12-4.72) were the risk factors.

Conclusions: A measles outbreak was confirmed. The risk factors were lack of vaccination and contact with measles cases. We recommend a mass vaccination, health promotion information, and better targeting of surveillance.

Session 011: Vaccine preventable diseases

O11.2. Neonatal Tetanus and Possible Associated Risk Factors in the Central Region of Viet Nam, 2002 – 2011

Do Manh Hung, Hang M. Nguyen, Phu D. Tran and Hien Do

Background: The Expanded program on Immunization (EPI) has been implemented in the Central Region of Viet Nam since the 1990's. Despite relatively high tetanus toxoid (TT) immunization coverage ($\geq 90\%$) during the period from 2002 to 2011, neonatal tetanus (NNT) still occurred due to the presence of associated risk factors. This study aimed to evaluate the effectiveness of the Neonatal Tetanus Elimination Program (NTEP) in the Central Region of Viet Nam.

Methods: We reviewed data from EPI monthly reports and case investigation reports from eleven provinces in the Central Region for the period 2002-2011. Data on the 38 NNT cases reported during this period and the survey information on knowledge of 48 midwives and health care workers (HCWs) were reviewed. Comparisons were made on possible associated factors between the periods of pre-NTEP (2002-2005) and post-NTEP (2006-2011).

Results: Vaccine coverage among pregnant women, child bearing age women and neonates increased (92.9% vs 95.9%; 95.8% vs 96.6%; 92.8% vs 96.5%, respectively) between the two periods. Incidence rate of NNT decreased by 48% (0.013/1,000 live births vs 0.025/1,000 live births) and NNT case-fatality ratio decreased by 5% (61.9% vs 58.8%). Analysis from NNT cases showed increased proportions of cases among the ethnic minorities (from 42.9% to 76.5%); among those whose mothers did not have prenatal care at health facilities (from 42.9% to 82.4%), among others. About 31% of the interviewed HCWs showed good knowledge on NNT. These are indicative of possible contributing factors for contracting NNT.

Conclusions: The NTEP has made positive changes in the NNT situation in the region, both in disease morbidity and mortality. One of the public health approaches to eliminating NNT is to focus on minimizing contributing factors to NNT while maintaining high immunization coverage among target groups.

Session O11: Vaccine preventable diseases

O11.3. Association between Behaviors and Hepatitis A Incidence in Depok District, Sleman, Yogyakarta, 2013

Siti Rahmah and C. Indriani

Background: The Sleman Health Center staff reported increased numbers of cases of hepatitis A, as many as 241 cases until May 8, 2013 and almost all of them were college students. The objective of this study was to determine behavioral risk factors for the increased incidence of hepatitis A in Sleman.

Methods: We did a case-control study. Cases were hepatitis A patients who had been diagnosed by doctors /health workers from February until May 2013, based on hospital records. Controls were those who don't have hepatitis A and located in the same neighborhood with the case. Sampling technique was consecutive sampling. Data were collected by telephone interviews. Statistical tests used were chi-square test and logistic regression.

Results: There were 280 respondents. The risk behaviors significantly associated with illness were history of contact with a hepatitis A patient (OR = 3.42; 95%CI = 1.97–5.95), not washing hands with soap (OR = 2.19; 95%CI = 1.32–3.65), not washing cutlery with soap (OR = 2.88; 95%CI = 1.03–9.25), frequently consuming vegetables or not boiling food (OR = 3.82; 95%CI = 1.94–7.81), sharing cutlery (OR = 2.09; 95%CI = 1.26–3.48), eating in a food stall with only 1 bucket for washing (OR = 2.22; 95%CI = 1.22–4.09), and don't pay attention to the cleanliness of food stalls (OR = 3.74; 95%CI = 2.19–6.41). Results of multivariate analysis showed history of contact with a hepatitis A patient (OR = 3.17; 95%CI = 1.82–5.52), frequently consuming vegetables or not boiling food (OR = 3.43; 95%CI = 1.73–6.81), and don't pay attention to the cleanliness of food stalls (OR = 3.28; 95%CI = 1.92–5.60) as significant risk factors for hepatitis A illness.

Conclusions: Unhealthy and unhygienic behaviors were risk factors for hepatitis A in Sleman. We recommended that the public always choose clean and safe food stalls when they consume fast food outside their homes.

Session O11: Vaccine preventable diseases

O11.4. An Investigation of a Family Cluster of Diphtheria Cases with Deaths in Nakhon Si Thammarat Province, Thailand, 2012

Seesai Yeesoonsang, K. Chukong, C. Libnoi, P. Klaiduang, S. Kamsaman, K. Suwanna, K. Mhonpangthiem, P. Siriarayapon and C. Pittayawonganon

Background: The incidence of diphtheria in Thailand has declined over the past two decades. Following a notification of a cluster of diphtheria cases with deaths in Kanom District in November 2012, we conducted an investigation to verify the diagnosis, confirm the outbreak, identify source of the outbreak, survey diphtheria vaccine coverage, and provide recommendations.

Methods: We defined a suspected case as a person who lived in Kanom District and had fever with sore throat, exudate tonsil with white patch at pharyngeal or tonsillar or anterior nasal between November-December 2012. A confirmed case was a suspected case with laboratory confirmed toxigenic strain *C. diphtheriae*. A carrier was a person who was positive for *C. diphtheriae* without any symptoms. We reviewed medical records, and actively searched for cases in school where cases attend and community. Throat swab and serum samples were collected for *C. diphtheriae* and anti-toxin immune level detection.

Results: Two confirmed cases died from complications of diphtheria since they had no vaccination history. Family specific attack rate was 87.5% (7/8) and 75% (6/8) were confirmed cases. Eight carriers and 658 close contacts were treated by antibiotics. Diphtheria-tetanus-pertussis (DTP) vaccination coverage in children <5 years old was 84% (95% confidence interval [CI] =71-98%). Diphtheria vaccine coverage in Kanom after two rounds of mop-up vaccinations with at least one month interval was 95% and 67%, respectively. Bad hygiene, bad sanitation, and high population density were observed in this family.

Conclusions: The outbreak of diphtheria in one family might be attributed to low vaccine coverage, bad personal hygiene, and high population density. Health officers should pay more attention to non-immunized children and routinely monitor vaccine coverage. After strengthening active case finding, providing post exposure prophylaxis and conducting dT mop-up vaccination, the outbreak was stopped.

Session O11: Vaccine preventable diseases

O11.5. Prolonged Diphtheria Outbreak in Houaphanh Province, Lao PDR, September 2012-January 2013

Khamla Lerdsaway, A. Phetphaythong, K. Vilaphanh, V. Phomvongsy, P. Phimmachane, C. Soulaphy, B. Khamphaphongphane, M. Phengxay and C. Winter

Background: Diphtheria is a bacterial upper respiratory infection characterized by sore throat, low grade fever, and adherent membranes on tonsils and pharynx. It is vaccine preventable and included in the diphtheria–pertussis-tetanus (DPT) childhood vaccinations of most country programs including Laos. On 31 October 2012, one severely ill boy with sore throat and breathing difficulties was reported from the Provincial Hospital with the information that many people in the child’s village were suffering from similar symptoms. An investigation was initiated to identify the cause of the outbreak and conduct appropriate control measures.

Methods: We carried out active case finding in the affected district using the following suspected case definition: a person from the affected village with sore throat or breathing difficulties or parotid swelling or adherent membrane with onset of symptoms after 1 September 2012. We interviewed identified cases or their caretakers using a standardized questionnaire. Descriptive analysis was conducted with Excel. Throat swabs were taken from 15 cases for isolation of *Clostridium diphtheriae* by culture.

Results: In total, we identified 78 suspected and three laboratory-confirmed cases. Five cases had died (age 6-16 years). The overall attack rate was 0.7% and 38.3% among children 10-14 years of age. The case fatality rate was 6.2%. Only one of the cases had been previously vaccinated against diphtheria (first DPT dose). In response to the outbreak, DPT vaccinations were administered to children aged 2-19 years in the district.

Conclusions: This diphtheria outbreak could be explained by the very low DPT vaccination coverage of children. The high case fatality rate indicates inadequate medical treatment or late access to medical care. This outbreak highlights the need to deliver all required DPT childhood vaccination doses to children in countries with limited medical resources.

Session O11: Vaccine preventable diseases

O11.6. Investigation of Diphtheria Outbreak at Bondowoso District, East Java, Indonesia, June 2011

Friskila Damaris Silitonga, B. Murtiningsih, A. Prasudi and M. Pulungan

Background: Diphtheria was a public health problem in areas of East Java, Indonesia. A diphtheria outbreak occurred at Bondowoso district, the case fatality rate (CFR) was high (8.8%) based on regional surveillance data. It was the highest case fatality rate (0.14%) in 2011. We conducted an investigation to identify risk factors, source of transmission and to institute control measures to stop the outbreak.

Methods: We did a 1:1 matched case control study. Cases were persons positive for diphtheria who presented signs and symptoms or carriers. Controls were close contacts from the same place, matched for age and gender, negative for diphtheria, and not a carrier. Data were collected through interviews and review of medical records. Swabs were taken for laboratory diagnosis. Data were analyzed by computing for Odds Ratios (OR) with 95% Confidence Intervals.

Results: 37 cases were identified, three of who died (CFR: 8.1%). Five percent were positive carriers. Common symptoms were fever (100%) and pain when swallowing (78.4%). Most (37.9%) were in the 6-10 year age group. Majority was female (62.2%). Cases were spread across 16 villages in Bondowoso district, from 1st May to the end of July 2011, with most cases (51.4%) coming from Wringin village. Bivariate analysis showed non-immunization was a risk factor: no DPT1 OR= 7.4 (95%CI 2.625 – 20.59), no DPT 2 OR=8.4 (2.96 – 23.87), no DPT3 OR= 15.5 (95%CI 4.99 – 48.36), no DT OR= 3.9 (95%CI 1.47 – 10.09). The multivariate analysis showed that not receiving DPT3 was the dominant risk factor (Exp (B): 9.12, $p < 0.05$).

Conclusions: The outbreak occurred because of incomplete vaccination of children. The source of transmission (index case) was from Grujungan village. We recommended prophylaxis to protect the at risk population, treatment of cases and carriers, strict surveillance, making vaccines available for low income families, and education as prevention.

Session O12: Surveillance

O12.1. Role of media scanning and verification system as a supplemental tool to disease outbreak detection and reporting under the integrated disease surveillance program (IDSP)-India

Rajeev Sharma, A. Karad, B. Dash and L. S. Chauhan

Background: Media Scanning can supplement conventional disease surveillance systems to more rapidly detect outbreaks so that timely and appropriate action can be taken. To address this need in India a Media Scanning and Verification Cell (MSVC) was established on July 2008 with the objective to provide supplemental information to official surveillance system of Integrated Disease Surveillance Program (IDSP) at NCDC.

Methods: Print, electronic media and television reports are scanned manually for unusual health events daily by a team of assistants. Unusual health events are analyzed by trained epidemiologists who generate Media Alerts that are disseminated electronically to relevant State and District Health Officers and followed up by phone for verification. Verified Media Alert reports are distributed to responsible health authorities and stakeholders for appropriate public health action.

Results: A mean number of four Media Alert reports are generated each day. A total of 1,685 alerts were reported in 42 months (July 2008 to December 2011). Of these 1,241 alerts, 73.7% were verified as real events and 183 (10.9%) were considered outbreaks by local health officials. Most events were detected from internet (57%) or print media (24%) sources. The most common disease events identified were food-borne diseases and diarrhoea (29.1%), dengue (10.68%), influenza and respiratory disease (8.1%) and malaria (7.4%). The sensitivity of MSVC to detect outbreaks was 14.8% with more than half of outbreaks detected before they were identified by the conventional surveillance system.

Conclusions: In India, the MSVC serves as an Early Warning System gathering unconfirmed media reports of public health significance in real time and immediately disseminating the information to the public health community electronically for verification and action. It often identifies outbreaks before the conventional reporting system, helping initiate an earlier response and containment. It has proven to be a highly effective supplemental tool in the timely detection and management of public health threats in India.

Session O12: Surveillance

O12.2. Event-based Surveillance System (ESR): Philippine FETP Trainees Know Where the Outbreaks Are

Vikki Carr de los Reyes, MN Sucaldtío and EA Tayag

Background: In the past 25 years of the Philippine Field Epidemiology Training Program (FETP), rumors of outbreaks were captured through newspapers, radio or television reports. In current years, the National Epidemiology Center (NEC) has established the Event-based Surveillance and Response (ESR) system with the goal to report Public Health Events of International Concern (PHEIC) to the World Health Organization (WHO) in accordance with the International Health Regulations (IHR). ESR also serves as the source of outbreak reports for FETP fellows to do outbreak investigations. The system includes six core processes: capture, filter, verification, assessment, response and feedback. FETP fellows rotate in the ESR unit during the course of their training. The ESR system complements the Philippine case-based surveillance system.

Methods: A descriptive study was done to profile health events reported through ESR in 2012.

Results: In 2012, a total of 512 rumored health events were captured through ESR. Forty-seven percent (239) of which were captured via the internet and 46% (234) were reported by routine surveillance officers. Fifty-six percent (287) were verified by the local health authorities to be true health events. Seventy-percent (213) were verified within 24 hours. Of the 287 health events, 53% (154) were Foodborne and Waterborne Diseases and 37 (13%) were Vector-borne Diseases. Sixty-seven percent of health events were controlled or closed by the end of 2012. None were PHEICs and 95% were of local concern. Thirteen were investigated by FETP fellows.

Conclusions: Since its establishment in 1987, the Philippine FETP relied much on health reports from newspapers, radio and television. At the advent of social media and instantaneous news reporting, there's always the challenge of verifying rumor reports from real health events. Through the established ESR, strategic ways to capture, verify and assess reported health events proved to be beneficial for the Philippine FETP fellows in doing response in a timely and appropriate manner.

Session O12: Surveillance

O12.3. Needs Assessment of Flood Victims in North Jakarta-Indonesia, January 2013

Jusly A. Lakapu, A.T. Endarti, S. Saleh, Bachtiar, P. Hafsari, S. Despriningtyas, M. Korib and H. Budi

Background: In January 2013, heavy rainfall caused flooding in 19 villages comprising 61% of North Jakarta District. Over 12,000 residents were evacuated and temporarily housed in seven schools, mosques or other buildings. A rapid survey was conducted to assess the needs of evacuees and provide information to disaster response managers.

Methods: We surveyed four emergency shelters to assess sanitation conditions, health services and availability of essential supplies including potable water. The premises were inspected and we interviewed three evacuees from each shelter to confirm our observations and hear their basic needs. To get an overview of the health status of evacuees, we reviewed clinical records for one day in health facilities catering to them. We collected water samples from each shelter inspected to check the turbidity of the water visually.

Results: Five-hundred families comprising 2,500 people were sheltered in four evacuation sites. The toilet to evacuee ratio was 1:100 (recommended ratio: 1:20) and supply of clean water was 20 L/person/day (recommended 120 L/person/day). Lack of water caused some evacuees not to bathe for 4-5 days. Upon inspection, water appeared turbid. We observed uncollected garbage, scattered waste and stagnant water within evacuation sites. Of the 215 patients seen in one day, 40% had diarrhea, 30% suffered from a skin disease, 20% had respiratory infections, and 10% were suffering from other diseases.

Conclusions: Poor environmental sanitation in evacuation shelters posed a significant risk to their health. Poly-aluminum chloride tablets were provided for water purification. A central disaster management team was needed to coordinate the distribution of food, water and other supplies for the evacuees.

Session O12: Surveillance

O12.4. Model Development of Integrated “One Health” West Nile Encephalitis Surveillance in Kanchanaburi, Thailand, 2012

Paisin Lekcharoen, W. Ardkhean, R. Wutthanarungsan, M. Worasuwanarak, P. Chuawong, V. Jongpiputvanich, K. Tonchiangsai, P. Prasomthong, P. Pradit, T. Pairthaisong, S. Jiemtaweewoon, S. Rittem, K. Sujit, S. Kuhapan, P. Churat, T. Parnlak, R. Jongcharasorn and M. Khaengkhetkar

Background: In 2009, West Nile virus (WNV) IgM had been detected in horse in Kanchanaburi. Humans are at risk if the disease is introduced via human or animal movements. Our objectives were to develop a model of “One Health” surveillance on West Nile virus and to strengthen provincial epidemiological team among public health, livestock and wildlife workers.

Methods: We assessed WNV situation in Kanchanaburi by reviewing encephalitis/meningitis patients during 2008-2012, prospectively monitoring for new patients and laboratory results. We monitored unusual sick/dead poultry and wild birds. Once a patient or unusual event in animal was notified, we established a multisectoral response team to survey avians nearby patient’s house and collecting mosquitoes for virus detection. Human samples were detected for WNV using RT-PCR and antibody against flavivirus while samples from avian and mosquitoes (≤ 50 mosquitoes/pool sample) were screened for WNV using VecTest® and confirmed by RT-PCR. We performed serological survey in horses using ID screen®.

Results: We found 140 previous cases and nine new patients with most having had contact with animals and mosquito bites. No WNV was detected from all patients’ blood and CSF samples as well as dengue IgM and IgG, and JE IgM. No unusual sick/dead poultry or wild birds were notified. Environmental investigation was conducted for three new cases. No evidence of WNV among 194 birds (172 passerines and no corvids), nine poultry, 52 mosquitoes (five *Culex* species and two *Aedes* species), and 43 horses.

Conclusions: Bird and mosquito species collected in this study had been reported to be infected with WNV in other regions, thus we suggest monitoring on wild birds and mosquitoes are key elements for early detection and multisectoral surveillance activities are needed.

Session O12: Surveillance

O12.5. Adverse Event Following Immunization (AEFI) and Acceptability Survey following Seasonal Influenza Vaccine Introduction in Lao PDR, 2012

Phontavy Khodsimueg, K. Sengsaiya, M. Phengxay, S. Mirza, R. Reyburn, J. Bresee, A. Moen, V. Khanthamaly, C. Winter, A. Corwin and A. Xeuatvongsa

Background: In 2012, the Lao PDR introduced seasonal influenza vaccine based on evidence of seasonal influenza occurrence. The vaccine campaign managed by the National Immunization Program targeted 375,000 persons; and served as an example as to the feasibility and safety/acceptability of seasonal influenza vaccinations in countries like Lao PDR. This assessment was intended to describe adverse events following immunization (AEFI) and acceptability in targeted groups.

Methods: Survey participants (2,089) were randomly selected from four risk groups: pregnant women, persons aged >50 years, chronically ill and healthcare workers. Interviews were conducted by the Lao Field Epidemiology Training (Lao FET) cohort four as part of their field experience.

Results: Thirteen percent of subjects surveyed reported one-or-more AEFIs, all mild reactions: redness or swelling around injection site (22%), fever (13%), headache (13%), nausea (15%), and general (11%) and focal weakness (10%). Post vaccination occurrence of AEFIs averaged 7 days, with a range of 2 to 22. The acceptability of annual influenza vaccinations was 99%, and 95% of parents wanted their children vaccinated.

Conclusions: With no severe AEFIs and high acceptability, there is strong rationale for annualizing seasonal influenza vaccine into the national immunization strategies.

Session O12: Surveillance

O12.6. What is the Best Model for Serious Adverse Events Following Immunization (AEFI) Surveillance in Australia?: Evaluation of Surveillance for Intussusception (IS) Following Rotavirus Vaccines as a Case Study

Alexis Pillsbury, H. Quinn, K. Macartney, M. Kirk and P. McIntyre

Background: Rotashield was the first available rotavirus vaccine. Its use, however, was problematic; increased IS risk led to withdrawal from American usage in 1999. In 2007, when two new rotavirus vaccines were introduced worldwide, Australia employed specific IS surveillance mechanisms beyond just passive AEFI reporting. This study evaluated the systems used to determine if such a mixed surveillance model could be considered for other new vaccines.

Methods: We evaluated Australia's IS surveillance using World Health Organization and Centers for Disease Control and Prevention frameworks. All four contributing surveillance mechanisms (passive AEFI surveillance; Australian Pediatric Surveillance Unit (APSU); Pediatric Active Diseases Surveillance (PAEDS) system; and hospitalization and Emergency Department (ED) databases) were assessed for sensitivity, data quality, timeliness, representativeness and usefulness.

Results: National passive AEFI surveillance was well-established but insensitive—detecting 17 IS cases compared with 200 jointly by APSU and PAEDS systems. These active systems, although providing greater clinical data including medical history and vaccination status confirmation, were not instituted prior to vaccine introduction. As these active systems were sentinel, some IS cases may not have been detected. ICD-coded cases from ED and hospitalization databases were representative, and data analysis was aided by using Brighton Collaboration criteria. Case review, however, was labor-intensive.

Conclusions: Passive surveillance alone was unlikely to detect increased IS risk associated with current rotavirus vaccines. Active surveillance was critical in evaluating IS risk and led to the first published study of IS risk associated with the new rotavirus vaccines. Data analysis from large healthcare databases also contributed significantly. Lower and middle income countries with spontaneous AEFI reporting could learn from Australia's experience and should consider similar multi-system models for optimizing AEFI detection.

Session O13: Non-communicable diseases

O13.1. Type D Personality as Predictor of Essential Hypertension in Sleman District, Yogyakarta Province, Indonesia

Lukman Fauzi and L. Anggorowati

Background: In 2009 – 2012, essential hypertension was the most common non-communicable disease in Sleman District. Moyudan Public Health Center (PHC) was the PHC with the highest reported numbers of patients with essential hypertension in the district. Type D personality, characterized by a joint tendency towards negative affectivity, e.g. worry and gloom, and social inhibition, e.g. reticence, has been associated with increased cardiac related mortality. We did a study among patients consulting at the Moyudan PHC to determine if there was a link between type D personality and essential hypertension.

Methods: We did a case-control study among 40-60 year old patients consulting at the Moyudan PHC. Cases were patients diagnosed with essential hypertension. Controls were patients without essential hypertension. Patients were consecutively sampled until 139 cases and 139 controls were enrolled in the study. We administered the standard DS-14 questionnaire to subjects to determine if any of them had type D personality and also collected data on demographics, physical activity, smoking, and body mass index (BMI). Data were entered into a computer and analyzed using Stata software. Chi-square tests and logistic regression were done.

Results: Ages of subjects ranged from 40 to 60 years (mean 49 ± 5.2). Type D personality was significantly associated with essential hypertension (OR: 4.22, 95% CI: 2.55-6.97). Even after adjusting for age, gender, BMI, physical activity, and smoking, the association was still statistically significant (AdjOR: 2.65; 95% CI: 1.51-4.68).

Conclusions: Type D personality is a predictor of essential hypertension. We recommended that hypertensive patients be given counseling and taught to deal with negative emotions in a healthy way. They were also encouraged to socialize more, avoid smoking, and maintain a normal body weight.

Session O13: Non-communicable diseases

O13.2. Nutritional status of children aged less than five years in Xuan Quang commune, Chiem Hoa district, Tuyen Quang province, Vietnam, 2011

Le Thi Huong, P. Le, H. Dao and H. Tran

Background: In Vietnam, malnutrition in children aged less than five years has improved, although the prevalence is still higher than other countries in the region. In mountainous provinces, where most of the people are ethnic minorities, malnutrition prevalence is very high. This study therefore aimed to evaluate the nutritional status of children in Xuan Quang commune, where the majority belongs to Tay ethnic tribes.

Methods: A cross sectional study of 382 children was conducted to identify nutritional status using weight for age (WAZ), height for age (HAZ) and weight for height (WHZ). Children were classified as underweight, stunted or wasted if their WAZ, HAZ, and WHZ z-score values were less than 2 standard deviations from normal values. Interviews on knowledge, attitudes and practices (KAP) were also conducted to identify factors associated with nutritional status. The association between malnutrition and KAP and other socioeconomic factors were analyzed using chi-square and Fisher's exact tests.

Results: Underweight, being stunted or wasted was identified among 18%, 23% and 14% of children respectively. Severe malnutrition was found in 6%. The highest prevalence of malnutrition was for those aged 36-47 months. There was a statistically significant association between stunting and a rice shortage within the household. Children of mothers with low knowledge and practices of pregnancy care, breastfeeding and complementary feeding were more likely to be malnourished.

Conclusions: Prevalence of malnutrition was still higher among the children in Xuan Quang commune than the overall prevalence in Vietnam. The nutritional status of children was related to the knowledge, attitude and practice of mothers. It is necessary to promote health education programs for improving the knowledge and practices of mothers in the study area in order to reduce the prevalence of malnutrition.

Session O13: Non-communicable diseases

O13.3. Cancer Incidence in Six Cancer Registries in Jiangxi Province, China

Jie Liu, L. Zhu , P. Yu, X. Yang, A. Li, L. Ji and J. Zhao

Background: The objective of the study was to understand the characteristics of the cancer epidemic in six cancer registries in Jiangxi Province and provide recommendations for local cancer control and prevention.

Methods: The data from cancer registries of Jiangxi province in 2010 were analyzed to calculate the cancer morbidity, sequence, the cumulative rate and truncated morbidity (35–64 years old).

Results: The crude cancer incidence rate of residents was 182.08 per 100,000, cumulative incidence rate was 16.96%, and truncated incidence rate was 252.32 per 100,000. The cancer incidence rate was higher in urban than in rural areas, higher in males than in females. The five most common cancers among men, lung cancer, liver cancer, stomach cancer, colon cancer and esophageal cancer, accounted for 69% of the total male cancer incidence. Breast cancer was the leading cause of cancer among women in urban areas, followed by lung cancer, stomach cancer, colon cancer and cervical cancer. Lung cancer was the leading cause of cancer among women in rural areas, followed by stomach cancer, liver cancer, colon cancer and breast cancer.

Conclusions: Digestive system cancers, lung cancer and breast cancer should become the focus of cancer prevention and control in Jiangxi province, China.

Session O13: Non-communicable diseases

O13.4. Breast Cancer Risk Factors among patients in Labuang Baji General Hospital, Makassar, South Sulawesi Province, Indonesia, 2013

Sukardi Pangade and A. Marisa

Background: According to the Global Burden of Cancer study, the breast cancer prevalence among women in Indonesia is 26 per 100,000. In Makassar, based on the medical records at Labuang Baji General Hospital, in 2012 the breast cancer prevalence among women was 18 per 100,000. This study was done to determine whether the following: family history, age of menarche, history of breastfeeding and the use of family planning pills were risk factors for breast cancer.

Methods: We did a case control study. The study sample consisted of 136 subjects (68 patients with breast cancer and 68 control-patients). The data was collected by questionnaire instruments. Analysis of data was done and Odds Ratios with 95% Confidence Intervals were calculated.

Results: A family history of breast cancer was observed in 39/50 (78%) cases and 29/86 (33.7%) controls (odds ratio=6.969, 95% confidence interval 3.11-15.582). Menarche before age 12 years was observed in 47/50 (94%) cases and 21/86 (24.4%) controls (odds ratio=4.379, 95% confidence interval 2.133-89.88). Breast feeding infants for less than six months was observed in 40/58 (68.96%) cases and in 28/78 (35.9%) controls (odds ratio=3.968, 95% confidence interval 1.925-8.181). Use of family planning pills for more than five years was observed in 33/60 (55%) cases and in 35/76 (46.05%) controls (odds ratio=1.432, 95% confidence interval 0.725-28.26).

Conclusions: A family history of breast cancer, having menarche at less than 12 years of age and breastfeeding infants for less than six months were risk factors for breast cancer. It is advisable for women to perform self-examination, maintain a healthy lifestyle, and practice exclusive breastfeeding for their infants.

Session O13: Non-communicable diseases

O13.5. Prevalence and risk factors for periodontal disease among adults, China, 2013

Qi Zhang, Z. Li, C. Wang, Y. Yang and L. Wang

Background: While the interrelationship between poor oral health and chronic diseases is well established, few studies are available in China. This study investigated strategies useful to estimate the burden of periodontal disease among adults in China.

Methods: In 2010, during a nationally representative survey among adults 18 years and older (n=161 surveillance points), we selected 3 surveillance points and the entire sample from each (600 x 3 = 1800) as pilot study sites. We collected basic demographic information, conducted a standard oral exam performed by trained staff, and defined periodontal disease as mild (4-5mm pockets) or severe (≥ 6 mm pockets). Diabetes status was determined using standard methods and criteria. We used multivariate logistic regression and assessed the independent association of various factors with severe periodontal disease.

Results: Our final study sample included 1,728 participants (96%) who had complete information. The prevalence of severe periodontal disease was 1.9% (32/1728) (95%CI 1.3-2.5). Univariate analyses found diabetes, low education levels, and male sex significantly associated with mild or worse periodontal disease. In multivariate models we found that compared to those without diabetes, those with diabetes were 2.5 times more likely (OR 2.5, 95% CI 1.1-5.7) and, compared to women, men were 3.4 times more likely (OR 3.4, 95% CI 1.6-7.4) to have severe periodontal disease.

Conclusions: Severe periodontal disease was found at low levels among adults in China during this pilot study. Control efforts should especially focus on high risk groups for severe disease such as those with diabetes and men. Population-based studies are feasible and are needed to understand the extent and to effectively respond to this key oral health issue.

Session O14: Public Health Interventions

O14.1. Newborn care practices and challenges in home based postnatal newborn care (HBPNC)-- Mewat, Haryana, India, 2013

Latika Nath, M. Murhekar, P. Kaur and R. Gupta

Background: In India, the Home-Based Postnatal Newborn Care (HBPNC) program by Accredited Social Health Activists (ASHAs) under National Rural Health Mission was initiated in 2011 to reduce neonatal mortality rates (NMR). ASHAs get cash incentives for making six home visits for newborn care in Mewat, Haryana with a high NMR. We studied newborn care practices among mothers, determined risk factors for unsafe practices and challenges faced by ASHAs during home visits.

Methods: A cross-sectional survey was done among mothers in sub-centers selected using cluster sampling. We interviewed mothers and ASHAs in the selected sub-centers using semi-structured questionnaires. Safe practices included safe breast feeding, keeping cord and eye clean, wrapping baby, kangaroo-care, delayed bathing and hand-washing.

Results: We interviewed 320 mothers, 61 ASHAs and observed 19 home visits. Overall, 60% of mothers adopted less than three safe practices. Wrapping newborns (96%) and delayed bathing (64%) were better adopted than cord care (49%), safe breast feeding (48%), hand washing (30%), kangaroo care (20%) and eye care (9%). Illiteracy (OR:2; 95%CI 1.2-3.4), Muslim religion (OR:2.6; 95% CI 1.5-4.2), birth spacing \leq 2 years (OR: 1.9; 95%CI 1.1-4.1), lack of ante-natal care (OR: 2.3; 95% CI 1.4-3.7), no ASHA contact (OR:2; 95% CI 1.2-3.5), home delivery (OR:1.6; 95% CI 1.0-2.6) were risk factors for unsafe practices. ASHAs reported cultural beliefs, traditional birth attendants (dais) influence, lack of supervision by auxiliary nurse midwives (ANMs) and delayed referral for transportation of sick newborns as hindrances.

Conclusions: Knowledge-practice gaps existed among mothers counseled by ASHAs. Poor utilization of RCH services decreased opportunities for ASHA-mother dialogue on safe practices. Recommendations included training ANMs, training dais as ASHAs, innovative communication strategies for ASHAs and improved referral system.

Session O14: Public Health Interventions

O14.2. Health insurance coverage and its impact on healthcare cost among the Chinese floating population

Yinjun Zhao, L. Wang, Y. Jiang and Y. Li

Background: China's health insurance includes government-run basic health insurance and commercial health insurance, both of which have undergone system-wide reforms in recent years. Little is known about the insurance coverage and its impact among China's floating population of 230 million people.

Methods: A random sample of the floating population (with phones) was selected from the Chinese Chronic Disease Risk Factor Surveillance Floating Population Survey and a phone survey was conducted from June to December 2012. Information on basic insurance, commercial insurance coverage, annual income and expenditure (all spending on individual daily life) was collected. Insurance status was dichotomized to any insurance or no insurance. Gross medical costs (before insurance reimbursement) and net out-of-pocket (OOP) medical costs (after insurance reimbursement) were collected. All costs were in Chinese RMB. Univariate and multivariate logistic regression was conducted to control for confounders.

Results: A total of 590 participated (response rate 43.9%). Among participants, 40.2% and 3.4% were covered by basic and commercial insurance, respectively, and 57.2% were not covered by any insurance. Average gross and OOP costs were 1,980 RMB (sd: 6020) and 1,100 RMB (sd: 2748) respectively, and the average income was 33,000 RMB. We found that for every 1000 RMB increase in annual expenditures, persons were 2% less likely to have insurance coverage (odds ratio 0.98; 95% CI: 0.96-0.99). Increasing incomes (p -value <0.05) and age (p -value <0.05) were associated with higher gross medical costs. Finally, increasing income was not significantly associated with higher OOP costs (p -value >0.05).

Conclusions: Most of the floating population do not have insurance coverage. Policy interventions are needed that provide broader insurance coverage for the vulnerable floating population.

Session O14: Public Health Interventions

O14.3. Barriers to temporary modern contraceptive use among eligible couples of Nongstoin Block, West Khasi Hills District, Meghalaya, India, 2013: a population-based case-control study

Rapborlang Laloo, T. Bhatnagar and P. Kamaraj

Background: Meghalaya has one of the highest total fertility rates in India. The contraceptive prevalence rate among currently married 15-49 year old women is 24%. Our objective was to determine the factors associated with non-use of temporary modern methods of contraception among eligible couples.

Methods: We conducted a case control study in Nongstoin block. Cases were couples who were not currently using contraception and controls were current users. Participants were recruited using the eligible couple register at health centers. Husbands and wives were interviewed separately using a pre-tested questionnaire. We did multiple logistic regression analysis to estimate adjusted odds ratios (AOR) and 95% confidence intervals (CI).

Results: Data was collected from 142 cases and 122 controls. Knowledge about free availability of condoms (AOR 10, 95% CI 2-16 in men, AOR 8.4, 95% CI 4.6-15.3 in women), discussing contraception with spouse (AOR 84, 95% CI 17-400), perception that contraception was against religion (AOR 2.1, 95% CI 1.1-4.3 in men, AOR 3.5, 95% CI 1.5-7.7 in women), never told about family planning by health worker (AOR 11, 95% CI 5-25 in men, AOR 10, 95% CI 5-17 in women) and no visits by health workers to village (AOR 7.7, 95% CI 4.4-13.6 in men, AOR 3.3, 95% CI 2.2-5 in women) were significantly associated with non-use of contraception for both men and women. Desire for more children (AOR 2.6, 95% CI 1-6.8), knowing others who used contraception (AOR 0.4, 95% CI 0.2-0.7) and perception that contraception is women's business (AOR 4.4, 95% CI 1.7-11.3) were significant factors for women only.

Conclusions: Health workers need to be reoriented to inform couples about the various methods available and the correct ways to use contraception.

Session 14: Public Health Interventions

O14.4. Effect of Vitamin A and D Supplementation on Acid Fast Bacillus (AFB) positive Pulmonary Tuberculosis Patients' Sputum Conversion Acceleration during the Intensive Treatment Phase-- Wonosobo district, Indonesia, 2012-2013

Pratiwi Rita Dian

Background: The incidence rate of pulmonary TB in Wonosobo District has been increasing over the years. In 2011, the sputum conversion rate had reached 83.8%. However, the incidence rate of pulmonary TB is still relatively high. This is influenced by many factors, one of which is the process of transmission. Transmission may still occur until end of intensive medication (2 months). Vitamin A and D as immunoprotection can be used as supplements that can accelerate sputum conversion. A study was undertaken to find out the effect of vitamin A and D supplementation in accelerating sputum conversion of pulmonary TB patients during the intensive treatment phase.

Methods: The study was a double blinded randomized controlled trial. Subjects were acid fast bacillus (AFB) positive pulmonary TB patients undergoing intensive treatment. There were two groups. One group comprised as many as 30 patients given vitamin A supplements at a dose of 1 x 5000 IU/day and vitamin D at a dose of 1 x 400 IU/day whereas the other group was the placebo group.

Results: Vitamin A and D supplementation accelerated sputum conversion ($p= 0.003$; HR 2.45). Sputum conversion acceleration, as much as 86%, occurred in the treatment group during the second week with vitamin A and D supplementation.

Conclusions: Vitamin A and D supplementation could accelerate the incidence of sputum conversion as much as 2.45 times more than the placebo group; thus, vitamin A and D could be used as complementary supplements in the treatment of pulmonary TB patients during the intensive phase.

Session O14: Public Health Interventions

O14.5. A 2012 Fireworks Injury Prevention Campaign with a Decrease in Fireworks Use among School Children – Philippines, 2013

Paola Katrina G. Ching, RA Ramos, MJ Zapanta, VC de los Reyes, MN Sucaldito and EA Tayag

Background: In October 2012, a pre-yuletide survey among school-aged children was conducted to identify their knowledge on fireworks injury prevention during the yuletide celebrations. In March 2013, a post-yuletide survey was conducted to determine the prevalence, risk factors and change in fireworks use.

Methods: A nested case-control study was done. A case was a respondent who used fireworks while a control did not use fireworks. Data was analyzed using Epi-Info version 3.5.4. Responses during the pre and post-yuletide surveys were subjected to McNemar's test of change.

Results: A total of 605 children were interviewed. Fifty percent were male. Ages ranged from 5-15 years (median=9). Thirty-one percent were fireworks users. Majority (55%) of fireworks used were prohibited ones. Twenty-seven percent were given by their mothers and 19% by their fathers. Fireworks users were most likely to be male (OR 2, 95% CI 1 - 3, p=0.01), >10 years old (OR 2, 95% CI 1-3, p=0.01) and had family members who were fireworks users (OR 5, 95% CI 3-7, p=0.00). There was a significant reduction of fireworks use ($\chi^2=22.12$, 95% CI 2-4) and significant increase in choosing campaign slogans with gory blasted hands.

Conclusions: This result showed a marked change in fireworks use among children. Highly effective promotional material impacts the prevalence of fireworks use. School authorities plan to make a regular fireworks campaign for parents in time for the 2013 yuletide celebration. A nationwide survey will be undertaken as a result of this study.

Session O14: Public Health Interventions

O14.6. Breastfeeding practices in an indigenous minority community group: A cross-sectional study from Nepal

Narayan Subedi, S. Paudel and A. K. Poudyal

Background: Promotion of breastfeeding has been identified as one of the effective and evidence based interventions to improve health of infants and young children but it is still low in developing countries like Nepal. Various factors play an important role in breastfeeding practices and the practices existing in different indigenous minority community groups like Chepang are still not explored in Nepal. The study aimed to explore the existing knowledge and practices of Chepang mothers on breastfeeding and their associated factors.

Methods: A cross sectional descriptive design was used for the study in which 203 Chepang mothers with children under one year of age were randomly selected and interviewed. Quantitative method was applied for data collection. Analysis of association of demographic, health and socio-economic factors with breastfeeding was done using logistic regression.

Results: Practice of mothers on breastfeeding was found better than their knowledge. Only one third of them knew the appropriate time for early initiation of breastfeeding (within one hour). However, 36% had practiced it. Exclusive breastfeeding practice under six months was 87% although 60% had knowledge about the recommended duration. Colostrum feeding practice was 71% and prelacteal feeding was 4%. Literate mothers were likely to initiate breastfeeding at an appropriate time [AOR: 3.2 (95% CI: 1.51-7.17)] than the illiterate ones.

Conclusions: Feeding practices like giving colostrum and exclusive breastfeeding were found better in minority Chepang communities than the national average, however, early initiation of breast feeding needs to be improved. Early initiation of breastfeeding which was found low could be improved through counseling during antenatal and postnatal care services provided through health facilities. The study raised an issue about the need to explore the existing practices and to understand the specific context in such minority communities before implementing national breastfeeding programs.

Session O15: Respiratory diseases

O15.1. A rubella outbreak in female migrant workers – Hong Kong, 2011

Miuling Wong, YK Wan, SK Chuang

Background: Hong Kong had a high rubella vaccination coverage (>95%). We recorded rubella infection affecting three Indonesian domestic helpers in October 2011. Preliminary investigation showed that all three attended the same church service regularly. We conducted a study among the church service attendees to delineate the extent of outbreak and risk of infection.

Methods: We interviewed attendees on 16 October 2011 using a standardized questionnaire to collect demographic information and rubella vaccination history. We defined clinical patients as attendees reporting fever and rash, plus joint pain, lymph node enlargement or conjunctivitis since 1 September 2011. We offered blood test for all clinical patients. Confirmed patients were clinical patients with rubella IgM positive. We calculated attack rates (AR) and compared vaccination coverage by ethnicity.

Results: We interviewed 156 attendees, 149 (96%) were female and median age was 32 years. Among 129 with ethnicity information available, 123 (95%) were Indonesian. We identified nine additional clinical patients who were laboratory confirmed. In this outbreak, the twelve patients (AR=7.5%, 12/159) were all childbearing age Indonesian female (median 29 years, range 23 - 42). The AR among vaccinated, unvaccinated and unsure vaccine status (or no information) were 0.0% (0/38), 4.2% (3/71) and 18.0% (9/50) respectively. Including the three index patients, 25/126 Indonesian attendees were vaccinated (20%), as compared with 4/6 (67%) in non-Indonesian [$p=0.02$] and 9/27 (33%) in those without ethnicity information [$p=0.1$].

Conclusions: Our results suggest that female migrant workers of childbearing age were susceptible to rubella infection. Despite high local vaccination coverage, special communities with very low coverage may result in congenital rubella syndrome (CRS). Education regarding CRS risk and targeted supplementary vaccination should be considered in these subgroups.

Session O15: Respiratory diseases

O15.2. Distinct Risk Profiles for Human Infections with the Influenza A (H7N9) Virus among Rural and Urban Residents: Zhejiang Province, China, 2013

Meng Zhang, F. He, J. Lin, H. Ma and B. Zhu

Background: Much remains unknown about the epidemiology of human infections with the influenza A (H7N9) virus since it was identified in March 2013.

Methods: We conducted a case-control investigation to compare the exposure histories and risk factors during compatible time-periods between 43 of the 44 confirmed case-patients of H7N9 virus infection residing in Zhejiang Province and 215 asymptomatic, age- and sex-matched neighborhood controls recruited through random digit dialing. We used exact conditional logistic regression to evaluate the exposures and risk factors, stratified by urban and rural residence.

Results: Buying live or freshly slaughtered poultry from a market was significantly associated with illness onset among both urban [48% of case-patients and 12% of control-persons, adjusted odds ratio (AOR) =19, 95% CI: 2.3-929] and rural (33% of case-patients and 8.9% of control-persons, AOR=13, 95% CI: 1.5-8734) residents. In the rural area, tending to home-raised poultry (56% of case-patients and 10% of control-persons, AOR=57, 95% CI: 7.5-8734) and existence of a poultry farm in the vicinity of the residence (2.8% of case-patients and 5.6% of control-persons, AOR=37, 95% CI: 3.8-8734) were also significantly associated with disease onset. Presence of underlying medical conditions was a significant risk factor among urban residents (76% of case-patients and 13% of control-persons, AOR=49, 95% CI: 7.1-2132) but not among rural residents.

Conclusions: Risk profiles for H7N9 virus human infection differed between urban and rural residents, indicating that the virus might have been in stealth circulation in the poultry population before infecting humans. We recommend strict poultry market management and multi-sectoral collaboration to identify the extent of poultry infection in China.

Session O15: Respiratory diseases

O15.3. Outbreak of Adenovirus Infections in a Children's Ward -Johor, Malaysia, 2012: Nosocomial and Preventable?

Thilaka Chinnayah, H.A.S Badrul, N.C.M.D Shaharom, U. Noorhaida and K. Fadzilah

Background: On 7 June 2012, six young children (aged 3 months to 2 years) with confirmed Adenovirus infection by immuno-fluorescence test on nasopharyngeal aspirates were reported from the children's ward of a hospital in Johor. Five of them were on ventilation. Later, on the same day, one succumbed to his illness. An investigation was carried out to confirm an outbreak, identify risk factors and to advocate for control measures.

Methods: The investigation identified cases through active case finding in the concerned ward. Nasopharyngeal aspirates were taken for Adenovirus PCR and DNA sequencing. Cases in this case-control study were respiratory cases aged less than two years admitted to the ward with lab confirmed adenovirus infection. Controls were taken from the same ward with similar characteristics but lab negative for adenovirus (1:2). Throat and swab samples were taken from health-care workers (HCW) and medical equipment respectively. Environmental Risk Assessment was done using HIRARC format and infection control practices of HCWs were audited. Statistical analyses of the data were done using SPSS. Frequencies and odds ratios were calculated.

Results: Adenovirus Type 7 strain 0901H2/ShX/CHN/2009 was detected in 11 out of 32 positive cases linked to the paediatric ward. The case fatality rate was 12.5%. None of the HCWs were positive for Adenovirus. Significant risk factors were co-morbidity of the children (OR = 1.2; 95% CI: 1.04- 1.45) and medical equipment usage (OR = 1.6; 95% CI: 1.22- 2.09) during admission. One phlegm suction machine was found positive with similar strain. The ward was over-crowded (inter bed distance < three feet) with poor ventilation. Only 10% of HCWss practiced hand washing with no usage of glove and disinfectant during nursing procedures.

Conclusions: This was a nosocomial Adenovirus Type 7 0901H2/ShX/CHN/ 2009 propagated outbreak linked to the children's ward in Johor. It is preventable by addressing overcrowding, poor ventilation and improving infection control practices among HCWs.

Session O15: Respiratory diseases

O15.4. Resurgence of Measles in the Cordillera Mountains – Northern Philippines, 2013

Paola Katrina G. Ching, M.J. Zapanta, V.C. de los Reyes, M.N. Sucaldito and E.A. Tayag

Background: On May 28, 2013 the National Epidemiology Center was informed of suspect measles cases in the Cordillera. In 2010, a measles outbreak occurred in the Cordillera. This report describes the outbreak investigation conducted.

Methods: An unmatched case-control study was done. A suspect case was any well individual residing in Cordillera with fever and generalized maculopapular rash with any of the following: cough, coryza and conjunctivitis from February 2 to May 27, 2013. A control was any well individual residing in the same or nearest household of a case negative for measles IgM. We included questions on knowledge, attitude and practices (KAP) in the questionnaire.

Results: There were 50 measles cases with one death (CFR= 0.02%). Ages of cases ranged from six months to 32 years (median=16 years); 64% were male. Thirty-six (72%) of cases were vaccinated with one dose of anti-measles vaccine. Sixty-four percent was positive for measles IgM antibodies. Cases were nine times more likely to have traveled to an area with suspect measles cases (OR 9, 95% CI 2-43, p=0.00) and 22 times more likely to have family members who got sick with measles (OR 22, 95% CI 4-138, p=0.00) than controls. Ninety-six percent knew about the disease but 32% had poor attitude and practice on measles prevention. There was overcrowding in households of cases.

Conclusions: There was a resurgence of measles in Cordillera. Exposed individuals without booster dose and poor prevention and control practices hastened the spread in an overcrowded area. Measles catch-up vaccination was done. Vaccination status of children should be determined upon school entry.

Session O15: Respiratory diseases

O15.5. Bronchial Asthma Risk based on Distance from Lapindo Sidoarjo Mudflow Center of East Java, 2012

Hermawan, H. Kusnanto and Y. Djam'an

Background: Asthma is a chronic inflammatory airways disorder. Precipitating factors could be irritants like respiratory cooling, allergens and emotion and stimulants such as chemicals, infections and allergens. The Lapindo mudflow which began in May 2006 issued a toxic gas which is bad for health. This study's objective was to understand the risk factors for asthma in communities around the Lapindo mudflow based on distance of residence from the center of the Lapindo mudflow in Sidoarjo.

Methods: A cross sectional study of a sample of 225 people living near the center of the explosion was done. Asthma was diagnosed using spirometry and questionnaires; variable smoke exposure and duration of exposure to Lapindo gas was measured by a questionnaire, the distance was measured using GPS.

Results: There were 53 (23.6%) of respondents diagnosed with asthma. Bivariate test showed there is a relationship between distance of residence and history of passive smoking with bronchial asthma. There was no relationship between duration of exposure to the gas, current and ex-active smoking on the incidence of bronchial asthma. Multivariate analyses showed that distance from the center of the explosion had an effect on the incidence of asthma, $p = 0.004$ (OR: 2.6, 95% CI: 1.36-5.061) compared to passive smoking variables $p = 0.034$ (OR: 2.45, 95% CI = 1.068-5.634).

Conclusions: Distance of residence from the Lapindo mudflow center is the most dominant factor causing asthma. It is advisable to relocate all the people living within a three km radius from the center of the explosion.

Session O15: Respiratory diseases

O15.6. An Outbreak of Legionellosis at a Business Centre in Kuala Lumpur

Rohani HJ Ismail, Normah S, Nurul H. MY, Norhaida U., Umami K.S. and Balachandran S.

Background: Legionnaires' disease was first described by Fraser et al following an outbreak of pneumonia among the participants of the American Legion Convention in Philadelphia in 1976. It was caused by *Legionella pneumophila* which is commonly found in aquatic environments. On 12 April 2013, the State Health Department received notification regarding two cases who worked in the same office and were admitted to a private hospital with similar respiratory symptoms. Investigation started immediately to identify causative agents, source of the outbreak and to recommend preventive and control measures.

Methods: Active case detection was carried out. All workers of the business center were interviewed regarding any respiratory symptoms. Clinical samples were taken from workers with respiratory symptoms. A cohort study was conducted to identify risk factors.

Results: A total of 1,365 workers were examined and 382 were defined as cases (attack rate 27.9%). Testing of blood samples revealed that 70 of 188 (37.2%) samples were positive for *Legionella* IgM. The business center is located in the middle of a four story block. The cooling tower used a cross flow system and was located at the roof top of the block. Water samples from the cooling tower and fountain pool were positive for *Legionella pneumophila* serogroup 1 and 2.

Conclusions: This *Legionella* outbreak was due to a contaminated cooling tower system and fountain pool. The cooling tower was manually cleaned and tested negative post cleaning. The business center authority was advised to regularly clean the cooling tower and fountain pool.

Session O16: Outbreak

O16.1. An Outbreak of Post Arthroscopic Melioidosis Knee Abscess in a Private Hospital –Selangor, Malaysia, 2012

Harishah Talib, A. Rosemawati, S. Rohani and K. Fadzilah

Background: Melioidosis is an infectious disease caused by gram-negative bacterium *Burkholderia pseudomallei* (Bp), a free living saprophyte in the soil. The organism can directly enter into the bloodstream via very minor wounds or skin abrasions. On 13 July 2012 hospital 'A' reported three cases of melioidosis who had undergone similar arthroscopic procedure to HL District Health Office. An investigation was conducted immediately to confirm the causative agent, describe the outbreak epidemiologically and recommend preventive measures to prevent similar outbreaks.

Methods: All patients who had undergone knee arthroscopic operations since June 2012 in "A" Hospital were interviewed face to face using a standard questionnaire. A case was defined as any patient from 'A' hospital who had undergone an arthroscopy operation since June 2012 and developed post-operative complication and clinical samples were positive for Bp. Medical records of cases were reviewed. A cohort study was done to determine the risk factors for getting the infection; RR and 95% confident interval (95% CI) were calculated.

Results: Out of 34 exposed patients, 22 were confirmed (64.5%) with one death (CFR 4.5%). Majority were male (68%), Malays (91%) and mean incubation period was three (SD2.5) days. Higher incidence rate was seen among teenagers (54%) and those above 50 years old (50%). No risk factors analysed were found to be associated with infections. Risk assessment showed there was a substandard method of sterilization performed by the nurses and the instrument was used repeatedly for different patients. Environmental sampling was negative for Bp but instrument's swab were positive for Bp. Genetic study of Bp showed 100% similarity between cases.

Conclusions: Post arthroscopic melioidosis knee abscess occurred due to substandard method of sterilization technique and sharing of contaminated instrument during operation. Training on proper practice of equipment's decontamination was conducted. Close supervision and monitoring by supervisors will help prevent similar problem in the future.

Session O16: Outbreak

O16.2. Foodborne Salmonella Gastroenteritis Outbreak in an Islamic Boarding School-Pondok Ranji, South Tangerang City, Banten, Indonesia, 2012

Aprinianis R I Bay

Background: In February 2012, health center staff were informed of a cluster of 12 diarrhea cases among female students of an Islamic Boarding School. We conducted an investigation to confirm the outbreak, identify the source and recommend appropriate interventions.

Methods: We did a case-control study. Cases were female students who had acute gastrointestinal illness. Controls were well female students from the same year level as the cases. Subjects were interviewed about the food items eaten on the 12th of February and any signs or symptoms experienced. We collected left-over food and water samples from the school for bacterial culture.

Results: Of 144 female students, 27 became ill (attack rate 19%). Incubation periods of cases ranged from 12 to 62 hours (median 39 hours). Signs and symptoms of cases were diarrhea (86%), abdominal pain (96%) and fever (79%). Twenty-seven cases and 43 controls were interviewed. Among the food items consumed by the students, croquette with meat (OR 3.33, 95% CI 1.05-10.63) and fried starch with vegetable and egg (OR 4.33, 95% CI 1.01-18.53) were associated with the illness. These food items were bought from the same food vendor and found to be positive for salmonella bacteria. Water samples were negative for bacteria.

Conclusions: The students probably had salmonella gastroenteritis acquired from eating contaminated food sold by the vendor. When students began to get sick, the vendor left the area. We recommended that school authorities advise students to avoid buying food items from ambulant food vendors as the safety of the foods sold by these vendors could not be monitored.

Session O16: Outbreak

O16.3. A Gastroenteritis Outbreak following a Village Feast—Temanggung, Central Java, Indonesia, 2013

Dwi Jumianto, M.A. Fahmi, C. Indriani, Masruchi and K. Mualim

Background: On April 29, 2013, the Tepusen Public Health Center reported 132 diarrhea cases following a feast in Kemiri village in Temanggung District, Central Java. Since a food poisoning outbreak was suspected, an FETP team conducted an investigation to characterize the outbreak, determine the source and recommend control measures.

Methods: We did a case-control study. Cases were those who attended the feast and developed gastrointestinal signs and symptoms. Controls were those who attended the same feast but remained well. Subjects were interviewed using a standard questionnaire. Data were entered into a computer and analyzed using Epi Info 7 software. Chi square tests were done. Left-over food and water samples were sent for laboratory testing.

Results: There were 103 cases from two hamlets. Majority (52.5%) were female. Most (31%) cases belonged to the more than 45 years age group. Incubation periods of cases ranged from six to 32 hours (median 13). Signs and symptoms of cases were colic (98%), diarrhea (96%), abdominal pain (89%), headache (16.5%), nausea (11%), chills (5%) and vomiting (2%). Among the food and drinks served, bottled tea (OR 2.64, 95% CI: 1.09-6.39) was significantly associated with having gastroenteritis. E. coli were detected in the water sent for testing.

Conclusions: Bottled tea was the probable vehicle for transmission in this outbreak. This bottled tea was home-made. River water is used in washing the bottles. The tea may have been contaminated by unclean bottles or made with contaminated water or other ingredient. We recommended that during large feasts, only food or drinks from known safe sources be served to guests. Any water used should also come from clean sources.

Session 16: Outbreak

O16.4. Foodborne Outbreak following a Circumcision Celebration - Sleman District, Yogyakarta, Indonesia, 2012

Lukman Fauzi and C. Heriana

Background: On January 4, 2012, a suspect food poisoning outbreak associated with a circumcision event in Sleman was reported. An FETP team was sent to conduct an investigation to confirm the outbreak, identify the source, and recommend control measures.

Methods: We did a retrospective cohort study among those who attended the circumcision celebration in Sleman. Illness was defined as having gastrointestinal signs and symptoms within 24 hours following the event. Subjects were interviewed regarding food consumed during the celebration. Ill persons were asked about their signs and symptoms and onset of illness. Data were analyzed using Stata software. Left-over food items were sent to the lab for testing.

Results: There were 231 who consumed food after the event, 133 of whom got sick (attack rate 57.6%). Majority (76%) of the cases had diarrhea. Incubation periods ranged from 3 to 10 hours (median 5 hours). Those who ate fried chicken (bacem) were more likely to get sick than those who did not eat this dish (RR 3.9; 95% CI 1.37-11.03). Staphylococcus aureus was detected in the fried chicken sample. The chicken were cooked 28 hours prior to serving and kept at room temperature without reheating.

Conclusions: This outbreak was probably caused by consumption of contaminated fried chicken. The chicken may have been contaminated during food preparation and storage prior to serving. The long time that the food was kept at ambient temperature provided opportunity for multiplication of organisms. Informal food producers should be trained on safe food-handling practices. Food should be served as soon as possible after cooking or stored in clean covered containers, refrigerated, and re-heated prior to serving. Sick persons should refrain from food handling.

Session O16: Outbreak

O16.5. Second melioidosis case reported in Korea since the establishment of the national notifiable infectious disease

Woncheol Lee, G-Y Kwon and D. Kwon

Background: Melioidosis was included in the national notifiable infectious disease surveillance of Korea in 2010. While melioidosis has been endemic in Southeast Asia and Northern Australia, only one patient had been reported in Korea since 2011. A 47-year-old man was reported to the Centers for Disease Control and prevention of Korea in July 2013. An epidemiological investigation was conducted of the possibility of a second melioidosis case in Korea.

Methods: We interviewed the patient and reviewed his medical records using a standard questionnaire. Blood specimen for identification of *Burkholderia pseudomallei* was examined with real time PCR, conventional PCR and culture by National Institute of Health.

Results: The patient had travelled to Hatyai, Thailand from June 22 to 28. Right after the trip, he visited a local hospital promptly because of high fever, not associated with other symptoms. He had medical history of hypertension, diabetes and chronic kidney disease. Ground glass opacities of lung were found in chest computed tomography, which were in accordance with pneumonia. Results of PCR and culture were analogous to melioidosis. Antibiotic treatment (cefuroxime plus clarithromycin for 4 days, cefazolin plus azithromycin for 2 days, Tiocla plus clarithromycin for 6 days, in sequence) was conducted immediately, and the patient recovered well.

Conclusions: This is the second case report of melioidosis in Korea since its inclusion in the national notifiable infectious disease surveillance system. According to the epidemiological study, this patient is thought to be an imported case of melioidosis. Due to climate change affecting infectious environment and increase of international travel to melioidosis endemic areas, early diagnosis and active surveillance are much more recommended in Korea.

Session O17: Zoonoses

O17.1. Risk factors for blue ear disease and preventive measures - Tam Ngai commune, Cau Ke district, Tra Vinh province, Vietnam, 2010

Tran Quoc Phong

Background: Over the years, many studies showed that blue ear disease (PRRS) is related to the strong growth of streptococci residing in pigs, pork meat infected with PRRS. The disease may carry pathogenic streptococci for humans. This study aimed to: i) initially identify risk factors associated with the rise and spread of PRRS; ii) help farmers and concerned agencies to have appropriate measures in the prevention of PRRS; and iii) help livestock development and protection of public health.

Methods: From a total of 1,020 households with pig farms in Tam Ngai commune, 90 households were randomly selected with and without the disease. A retrospective case-control study was carried out to examine the possibility of exposure to risk factors using statistical methods (i.e. Minitab software version 1.3) for each group and each research content.

Results: Factors reducing risk: Disinfect cages regularly. Factors increasing risk: Near slaughtering pig (6.39 times higher), near old outbreak farms (5.47 times higher), near shopping butcher area (7.93 times higher), near live pig market (3.4 times higher), near major roads (2.91 times higher), animals from other parts of unknown origin (5.86 times higher). No risk factors found from the use of food from household leverage and restaurants, or being close to the canal where PRRS had occurred.

Conclusions: Animal cages should be disinfected regularly; animals should be raised far from shopping areas, slaughtering places, and main roads. Continue research on other risk factors for the rise and spread of PRRS.

Session O17: Zoonoses

O17.2. Human infection with avian influenza A (H7N9) virus associated with live poultry or related environmental exposure in Jiangsu, China, 2013

Yong Huang, D Ren, J Ai, C Bao, F Tang, G Shi and T Shen

Background: Human infection with avian influenza A (H7N9) virus emerged in eastern China in 2013. A total of 132 confirmed cases, including 43 deaths, were reported in mainland China as of 30 June 2013, including 27 (20%) in Jiangsu. We investigated the emergence to identify the source of infection, mode of transmission and potential risk factors of the illness in Jiangsu.

Methods: We defined a confirmed case as the presence of the influenza A (H7N9) virus by means of real-time reverse-transcriptase-polymerase-chain-reaction (RT-PCR), viral isolation, or serologic testing. We selected all 27 confirmed cases in Jiangsu, and 93 controls matched on age, sex, and location to compare their exposure to live poultry and related environment.

Results: Of 27 patients, 10 (37%) had direct contact with poultry or birds, 20 (74%) had environmental exposure to poultry, and 5 (19%) denied any exposure to poultry or birds. The median incubation period from exposure to onset of illness was 6 days (range 2-10 days) in 10 cases with single known exposure. Factors that were independently associated with H7N9 infection were direct contact with poultry or birds (Odds Ratio [OR] = 9.1, 95% confidence interval [CI] = 1.6-50.9), chronic medical conditions (hypertension excluded) (OR= 6.0, 95% CI=1.3-27.3), and environmental exposure to poultry (OR=4.2, 95% CI= 0.9-19.6).

Conclusions: Infection with influenza A (H7N9) was associated with live poultry and environmental exposure to poultry. We recommended: that people (especially those with underlying diseases) should not have contact with live poultry or birds, government close live poultry markets in response to this emergence; and public health authorities should extend the period of medical surveillance and exposure interview from 7 days to 10 days.

Session O17: Zoonoses

O17.3. Epidemiology of human rabies - Vietnam, 2008-2012

Nguyen Thi Thanh Huong, H. Nguyen, T. Chu, Phu D. Tran and Hau V. Pham

Background: Rabies is a disease with a 100% case fatality rate and is an important zoonotic disease in Asia and in Vietnam. This study was conducted to describe the epidemiological characteristics of human rabies deaths from 2008 to 2012. The outcome of the study will provide evidence based directions for policy makers to more effectively control rabies.

Methods: Data from the Vietnam Rabies Control Program (VRCP) was used. Patients and their families were interviewed using standardized questionnaires. The data was analyzed using Epi-Info, to show descriptive statistics and conduct univariate analyses.

Results: There were 396 human rabies deaths from 2008 to 2012. Most cases occurred in the mountain provinces of northern Vietnam (73%). Most cases occurred from May to July. The median age of victims was 37 years and 61% of patients were male. The risk of rabies deaths in ethnic minority groups was higher than in the Vietnamese average (OR 3.29; 95% CI: 2.67–4.01). Ninety-six percent of patients had a history of a dog bite exposure. Fifty-one percent of victims didn't receive vaccination after a dog bite, despite good knowledge on post-exposure treatment. The median incubation time was 54 days (range 7-420 days), but was significantly shorter for head and neck wounds (43 days, $p < 0.05$).

Conclusions: This study shows that VRCP should focus its rabies control efforts on ethnic minorities in the mountainous north. The knowledge of rabies prevention and treatment (post exposure vaccination) should be enhanced by targeted risk communication.

Session O17: Zoonoses

O17.4. Inspection of risk factors for *Fasciola* spp. in cattle and buffaloes in Thua Thien, Hue province, Vietnam, 2010

Nguyen Thi Quynh Anh

Background: Diseases caused by *Fasciola hepatica* and *Fasciola gigantica* are common diseases in cattle and buffaloes in Thua Thien-Hue province of Vietnam, affecting animal productivity and human health. Livestock with the highest risk of infection are those that graze where *Limnaea* snails are present and that are not de-wormed. This study was conducted to identify risk factors for liver fluke infection in humans.

Methods: A cross sectional study was conducted in Thua Thien Hue province from August 2010 to February 2011. A questionnaire was administered to farmers to evaluate possible exposure factors, and a fecal specimen collected for laboratory testing. Relative risk ratios and chi-square tests were used to identify possible risk factors by comparing those with liver flukes in their stool to those without.

Results: Among 120 samples tested, 59 samples (49%) were positive for liver fluke eggs. Analyses showed that the following were risk factors among those that have been exposed to animals: annual deworming (RR: 2.97, p-value: 0.042), manure treatment (RR: 1.96, p-value: 0.017) and use of water from lakes, rivers and streams for livestock drinking (RR: 1.19; p-value: 0.044). The other exposure factors such as animal age and feed were not statistically significant (p value > 0.05).

Conclusions: This study shows that issues related to environmental pollution, such as the use of water from rivers and lakes for drinking remain. The elements identified as risk factors for liver fluke infection should be considered for future prevention strategies to limit the spread of liver flukes.

Session O18: Food and waterborne diseases

O18.1. A large outbreak of *E. coli* O157 gastroenteritis caused by slightly salted pickled napa cabbages in nursing homes, Japan, 2012

Ayako Tabuchi, T. Wakui, T. Yamagishi, Y. Yahata, T. Sunagawa and K. Oishi

Background: In August 2012, an Enterohemorrhagic *E. coli* (EHEC) outbreak occurred at several nursing homes (NHs) in and around Sapporo city with several deaths. FETP-Japan investigated the outbreak to identify risk factors and preventive measures.

Methods: Confirmed cases were persons with a gastrointestinal illness and isolation of EHEC O157 with the same gene pattern as the outbreak strain. Suspected cases were persons with a gastrointestinal illness from July 10 to September 10 among NH residents. We conducted retrospective cohort studies, trace back and environmental investigations. Stool and food samples were collected from patients and NHs. Bacterial cultures and genetic fingerprinting tests were conducted by Local Public Health Laboratories.

Results: Fifty-four confirmed cases and 54 suspected cases were reported from 12 NHs in and around Sapporo city (median age: 86.5; range: 25-102 years). Of 108 cases, seven (6.5%) died. EHEC O157 was isolated from slightly salted pickled napa cabbages (pickles) preserved in two facilities. These pickles were processed and distributed by one factory. All human and pickle isolates had the same gene pattern. However, as almost all residents ate the same meals at each facility, eating neither pickles nor other foods were statistically significant. The pickle factory investigation revealed that there was insufficient washing and sterilization of vegetables and non-thorough zoning of clean areas. We recommended pickle processing factories in Japan should improve food preparation practices, both locally and nationally.

Conclusions: Through our investigation, we identified contaminated pickles as the cause of this outbreak. This was the second EHEC O157 outbreak in Japan in 10 years with pickled vegetables implicated as the source. Public health agencies nationwide have been notified of the need to strengthen food preparation regulations for pickles.

Session O18: Food and waterborne diseases

O18.2. Foodborne Outbreak following a Celebration in Semawung Hamlet, Indonesia, May 2013

Fatma Nuraisyah, M. Ali Hanafi, N.A. Ulfah, B. Rahayujati and B. Murtiningsih

Background: On May 17, 2013 seven persons consulted at the Kalibawang Health Center for gastrointestinal signs and symptoms after consuming food from a ceremony. An FETP team was sent to conduct an investigation to confirm the outbreak, identify the source and recommend control measures.

Methods: A matched case-control study was done. Cases and controls were matched for age and gender. Cases were persons who consumed food served during the ceremony and developed gastrointestinal signs and symptoms. Controls were persons who consumed food served during the ceremony and remained well. Subjects were interviewed regarding food items consumed. Left-over food items were sent to a laboratory for testing. Data were analyzed using Stata software.

Results: There were 170 cases. Majority of patients had diarrhea (73%) and abdominal pain (67%). Incubation periods ranged from 1-16 hours (median 8). The epidemic curve showed a point source outbreak. Sixty cases and 60 controls were included in the case-control study. Food items associated with illness were fried chicken (OR 10.47, 95% CI 2.34-46.70) and spicy vegetable (OR 6.88, 95% CI 1.38-34.29); these were positive for *Bacillus cereus*. Foods were stored at room temperature with some persons taking food home to share with their families, some of who also got sick.

Conclusions: This outbreak was probably caused by food contaminated with *Bacillus cereus*. The foods could have been contaminated during preparation and storage. We recommended that food handlers be given information on proper food handling.

Session O18: Food and waterborne diseases

O18.3. A Gastroenteritis Outbreak in an Acrobatic Training Class Caused by Leftover Rice--Sichuan, China, 2012

Yajun Sun, X. Chen and L.J. Zhang

Background: On May 24, 2012, a hospital reported that 18 students in an acrobatic training class had presented with vomiting. We conducted this investigation to identify the source of this outbreak and risk factors and to recommend control measures.

Methods: A case was defined as a student in the class with onset of vomiting from May 24 to 25, 2012. We interviewed students about their symptoms and food exposures at lunch and dinner on May 24. We compared food-specific attack rates (AR) in a retrospective cohort study. Leftover fried rice and vomitus specimen were collected for *Staphylococcus aureus* and *Bacillus cereus* culture.

Results: Eighteen cases were found among 22 students (AR 82%), with incubation periods of 1.5-2.8 hours. The main symptoms were vomiting (100%), nausea (94%) and stomach ache (44%). Ten foods were provided to students for lunch and dinner. All students ate fried rice. The AR between students who ate and did not eat each of other nine foods showed no statistically significant difference. Greater intake of fried rice adjusted by body weight was correlated to frequency of vomiting, Spearman correlation coefficient was 0.47 ($p < 0.05$). Students were divided into two groups according to intake of fried rice, those who ate \geq two bowl group with the average frequency of vomiting of 3.8 times had significant difference compared with one bowl group with the average frequency of vomiting of one time ($t=2.3, p < 0.05$). The leftover rice from lunch had been kept at room temperature (22°C) for four hours, and then used for dinner. *Staphylococcus aureus* and *Bacillus cereus* cultures were negative.

Conclusions: This outbreak was probably caused by the fried rice. We recommended that the health department train the chef to keep leftover food in a refrigerator.

Session O18: Food and waterborne diseases

O18.4. Food Poisoning Outbreak following a Christmas Celebration at an Elementary School—Kediri City, East Java, Indonesia, 2012

Mohammad Ali Masudi, T. Trikuncoro, A. Fahrudha and T. Agung

Background: On December 19 a suspected food poisoning outbreak following a Christmas celebration at an elementary school in Kediri City was reported. An FETP team was sent to conduct an investigation to determine the cause of the outbreak and recommend appropriate public health interventions.

Methods: We did a case-control study. Cases were students who attended the celebration in school and developed gastrointestinal symptoms. Controls were students who attended the celebration but remained well. Subjects were interviewed about food and drinks consumed during the celebration and for cases, their onset of illness and signs and symptoms. Left-over food samples were sent to a laboratory for testing. Data were entered into a computer and analyzed using STATA 12 software. Chi-square tests and logistic regression were done.

Results: There were 228 cases and 42 controls. The epidemic curve was that of a point source outbreak. Incubation periods ranged from 15 minutes to 11 hours (median two hours). The main symptoms of cases were vomiting (84%) and nausea (83%). Among the food items served, noodles were significantly associated with the illness (OR 22.41, 95% CI: 8.74-57.41). Laboratory tests detected formalin in the noodles. All other food items were negative for formalin. No bacteria were detected from the noodles.

Conclusions: Noodles containing formalin was the probable cause of this food poisoning outbreak. Formalin contains formaldehyde, a toxic chemical sometimes used as a preservative. Since the noodles were prepared at 3:00 a.m. but were served at 11:00 a.m., it is likely that preservatives were used to keep the noodles in good condition. We recommended that people refrain from using formalin or formaldehyde as a food preservative.

Session O18: Food and waterborne diseases

O18.5. An Outbreak of Food Poisoning among School Hostel Students—Penang, Malaysia, 2013

Sunita Abdul Rahman, Rafidah MN, Bina Rai and Fadzilah K

Background: Food poisoning in school is a common occurrence in Malaysia. Similarly in Penang State, 50-80% of food poisoning occurs in school hostels. On 22 January 2013, district health authority received notification from hospital of fourteen students presenting with diarrhea and vomiting on early morning and treated as outpatients. The response teams were immediately mobilized to verify the outbreak, identify the source and implement control measures.

Methods: Case definition of diarrhea, vomiting with/without headache was used in active case finding. A retrospective cohort study was conducted to identify risk factors. Students were interviewed using a standard questionnaire. Stools and rectal swabs were taken from cases and food caterers and sent to a laboratory for identification of causative agents. Food caterers were checked for vaccination status. Food caterer's house, food handlers' hygiene, storage and preparation were observed and inspected. Swabs were taken from kitchen utensils. Data was analyzed using statistical software to measure the risk of food consumption.

Results: Attack rate was 33.3% (33/99) and majority of cases were girls. Mean age of cases was 13 years (SD 2.47). The main symptoms were diarrhea (100%) and vomiting (82%). Stool sample of one food caterer was positive for *Salmonella typhi* 33% (1/3) and he did not have immunization against typhoid. The food was prepared in food caterers' house and hygiene was inappropriate. Cooking utensil swab was negative. We found that consumption of fish curry served at lunch had higher risk of food poisoning RR: 2.58 (95% CI: 1.00, 6.68).

Conclusions: This food poisoning outbreak among school hostel students was linked to consumption of contaminated fish curry. Food handler was referred for treatment and the school authority ordered to have proper kitchen to ensure food safety and quality.

Abstracts of Poster presentations

Section 1: Food and waterborne diseases

P01. Development of a Diagnostic kit to detect *Cryptosporidium parvum* and *Giardia lamblia*

Hyeng Il Cheun, S. Cho, W. Lee and S. Youn

Background: The Korea Centers for Disease Control and Prevention has launched a project to establish a network to check the spread of contagious diseases through contamination of water and food sources by monitoring parasitic protozoans in patients with diarrhea. This study aims to develop a high-sensitivity antibody diagnostic kit that will enable a rapid and accurate detection of these parasites in patients with diarrhea, so that early treatment can be initiated in the affected patients.

Methods: 200 mg of the emulsion of *C. parvum* and *G. lamblia* were separately mixed with complete Freund's adjuvant was injected four times into the tail vein of a mouse at a 2-week interval. The serum was separated and ELISA was used for titration of the serum sample. Spleen cells of the immunized mouse were separated and blended with myelomas to produce hybrid cell lines that form monoclonal antibodies. Using ELISA method, antibodies that specifically respond to *C. parvum* and *G. lamblia* were then selected respectively. The cell lines were cultured in a large quantity, and the cells were injected into the abdominal cavity of a BALB/c mouse to isolate hydrops abdominis containing high level of antibodies. The IgG antibody was purified using protein G gel.

Results: The detection limit of monoclonal antibodies for *C. parvum* and *G. lamblia* was 125 oocysts/mL and 1,250 cysts/mL, respectively. In addition, during testing they did not show cross-reactivity to viruses (n = 15), bacteria (n = 17), and parasites (n = 9).

Conclusion: The rapid diagnostic antibody kit developed in this study, which specifically responds to *C. parvum* and *G. lamblia*, will be useful in detecting and monitoring diarrheal infections. Key words: *Cryptosporidium parvum*, *Giardia lamblia*, immunochromatography, rapid diagnostic kit

Section 1: Food and waterborne diseases

P02. A Foodborne Outbreak of *Escherichia coli* Gastroenteritis in an Islamic Boarding School--Bogor District, West Java, Indonesia, June 2013

Marlina M. Simbolon, Leny, M. Nuning, R. Djuwita, M. Adang, Evawangi and Rusyad

Background: On June 31, 2013, Bogor Health Office received a report from Parung sub-district Public Health Center of a foodborne outbreak in an Islamic Boarding School. We investigated the outbreak to determine its extent, identify source of infection and to implement control measures.

Methods: A retrospective cohort study was conducted among school members. A case was defined as a person who developed acute diarrhea and abdominal pain, with fever, nausea or vomiting within 48 hours of eating a meal purchased from a food vendor on June 30, 2013. We obtained a list of all patients showing signs and symptoms and collected information on food consumption. We conducted an environmental investigation. Food and water samples were obtained for laboratory confirmation.

Results: Among 31 persons (24 students; four teachers, three villagers) who ate meals, 22 (Attack Rate 71%) became sick. Ages of cases ranged from 10 to 65 years (median 13). Seventeen (55%) were female. The reported symptoms were nausea (77%), headache (73%), fever (68%), diarrhea (50%), abdominal pain (40%), and vomiting (24%). Four students were hospitalized, none died. The epidemic curve showed a common source outbreak. Among the three meal items served, rice cake vegetable soup had the highest relative risk (RR 4.04; 95% Confidence Interval 0.69-23.5). Incubation periods ranged from one to 30 hours (median 6 hours). High counts of *Escherichia coli* were found in water used to cook and clean fresh vegetables.

Conclusions: Water used to handle and cook food was the likely source of the outbreak. Implementing strict adherence to good food processing practices in school is necessary to prevent spread of infection.

Section 1: Food and waterborne diseases

P03. An Investigation of a Suspected Noroviral Gastroenteritis Outbreak in a Small Village--Guangxi, China, 2012

Yihong Xie, C. Jiraphongsa, C. Kunanusont, K. SaeJeng, Y. Tan and Zh. Tang

Background: On 24 October 2012, more than 10 villagers with vomiting, diarrhea and dizziness were reported to Guangxi CDC. We conducted an investigation to verify the cause and provide control measures.

Methods: Cases were villagers of Nakao village with diarrhea (≥ 3 times/day), or at least two symptoms (diarrhea, nausea, vomiting, abdominal distension, and abdominal pain) from 8 October 2012-1 November 2012. Active case finding was conducted among all 75 households. We compared 29 cases with 27 controls, surveyed environment to describe water circulation systems and collected nine stool samples from recovery patients to test for calicivirus, astrovirus, adenovirus, shigella, and salmonella by PCR and rotavirus by ELISA. Thirteen water samples from wells and river were tested for total coliform and bacteria colony.

Results: We identified 29 cases (attack rate = 25%) from 13-25 October 2012 with family-cluster pattern. Secondary attack rate was 29%. Symptoms included abdominal distention (93%), diarrhea (79%), nausea (69%), abdominal pain (66%), vomiting (48%) and headache (45%); no mucous and bloody diarrhea. One patient was admitted and half of cases self-recovered. Median duration of illness was two days (interquartile range (IQR) = 1-3 days). Illness was associated with contact with patients before three days of onset (OR=23, 95% CI=2.7-196). Untreated sewage directly flew into the river, and most water wells were located around 10-30 meters from the river. Median total coliform was 49 MPN/100mL and bacteria colony was 12 CFU/nL in well water.

Conclusions: Though the pathogen was unidentified, norovirus is the most likely cause based on clinical and epidemiological evidence. Contaminated water and person to person contact enhanced the disease transmission. We recommended to villagers and local government to improve environmental hygiene. After sodium hypochlorite for water-reservoir disinfection was given to each household on 24 October 2012, there was no new case since 26 October 2012.

Section 1: Food and waterborne diseases

P04. An Investigation of Gastroenteritis Outbreak caused by Transient Polluted Drinking Water in a Village, Jiangsu Province, China, 2013

Dafei Ren, R. Zu, T.Zhang and T. Shen

Background: On March 3, 2013, 25 villagers with gastrointestinal symptoms were reported to Binhai CDC, Jiangsu Province, China. We conducted an investigation to verify this outbreak, explore the source, and recommend measures for control and prevention.

Methods: We defined a suspected case as a villager with one of the following: nausea, vomiting, dizziness, or fatigue from 1 to 3 March. We checked medical records in clinic and township hospital, visited every family in the village to search for patients. We used retrospective cohort study to analyze the relationship between water and food consumption and disease, and collected 40 water samples to test for chemicals and bacteria.

Results: Of 25 suspected cases, median age was 40 years (range 1.5 to 81), 52% were male. Suspected cases were from three adjacent families in the north of the village. Clinical manifestations were nausea (100%), vomiting (100%), fatigue (96%) and dizziness (88%). The water plant supplies water for 40,000 people, with no chemical plant within 5 miles. The suspect water supply served 56 families, a total of 196 people. For 25 people using residual water from pipe before outbreak onset, attack rate 100% (25/25), while others who did not use were not affected (relative risk [RR] =8734). Eight of the water samples from patients' homes were above limit (0.5 mg/L) for concentration of ammonia nitrogen (range: 0.83 to 1039 mg/L).

Conclusions: The outbreak of gastroenteritis might have been caused by transient polluted drinking water, the result of interrupting water supply for installing water pipe by villagers. However, the specific substance causing poisoning was unclear. We recommend enhancing surveillance and management of water quality in rural areas, prohibiting interrupting water supply without warning.

Section 1: Food and waterborne diseases

P05. An outbreak of cholera due to contaminated spiced beef in a banquet--Huangshi, Hubei, China, 2012

Hao Zhang, J. Sun, X. Guan, J. Zhang, X. Xing, J. Chen and L. Zhang

Background: A case of *Vibrio cholerae* O139 was reported on October 6, 2012 in Huangshi, Hubei, China. We conducted this investigation to identify the agent, mode of transmission, and recommend control measures.

Methods: We defined a suspected case as onset since October 1, 2012, with diarrhea (≥ 3 times/24 hours), in Huangshi, Hubei. A confirmed case was a suspect case with positive *Vibrio cholerae* culture from stool. Stool samples were collected from all cases for cholera culture. Beef specimens were collected. In a case-control study, we compared consumption of different foods of 38 cases and 66 controls. We interviewed food handlers about food preparation.

Results: There were 49 cases (29 suspected, 9 confirmed, 11 asymptomatic infections), including three staff members. All the cases attended a banquet held on October 3. The attack rate was 17% (49/285). 74% of case-persons ate spiced beef compared to 53% of control-persons (OR=2.5, 95% confidence interval [CI] =1.03-6.1). There was no significant relationship between other banquet foods and disease. No leftover foods from the banquet were available for testing. After the banquet, the restaurant continued to serve spiced beef. We obtained a spiced beef specimen made on October 8, for which *Vibrio cholerae* testing was positive. The food handler said he put the cooked beef into a container which held cold dishes before and the container was placed in a refrigerator later. During preparation, this common container (which wasn't *Vibrio cholerae* positive) was used for cooked beef and cold dishes.

Conclusions: This cholera outbreak was probably caused by contaminated spiced beef. We recommend raising the awareness of good food handling practices for the food handlers.

Section 1: Food and waterborne diseases

P06. An outbreak of E. Coli Food Poisoning at Teluk Keke, Malaysia, 2012

Liza A. Latip, Balkis A. K., Mohd. J. and Anwa S.

Background: E. coli is a significant cause of bacterial diarrheal illness worldwide and transmitted by food or water contaminated with animal or human feces. On October 14, 2012, twenty participants of Athlete Retreat in the Perhentian Island had vomiting, diarrhea, abdominal pain, nausea and fever. An investigation started immediately to determine the causal agent and risk factors and to recommend control and prevention measures to avoid subsequent similar outbreaks.

Methods: A case was defined as any athlete with vomiting, diarrhea, abdominal pain, nausea and fever starting on October 12, 2012. All cases were interviewed face to face using a standard questionnaire. A case-control study was carried out. Three day food histories were obtained from cases and controls. Hazard analysis and critical control points (HACCP) was done. Samples from the environment and water supply were taken for laboratory testing to identify the causal agent. Data analysis was done using SPSS version 15.

Results: Twenty cases and 60 controls were interviewed. Six out of nine food items consumed during dinner on October 13 showed significant risk with shrimp curry having the highest risk (OR = 16.6; 95% CI: 2.1 to 132.3). The source of water was highly contaminated by coliform (>181 cfu/100ml). HACCP also indicated a problem with the water source. Septic tanks were located approximately 10 meters and higher than the water source.

Conclusions: This enterotoxigenic E. coli (ETEC) food poisoning outbreak was probably due to ingestion of contaminated untreated water as the septic tank was located near the water source. The water source (a well) was chlorinated as a short term measure. Chlorination of the well every three months had been recommended until a treated water supply would be in-place. We also advised boiling of drinking water.

Section 1: Food and waterborne diseases

P07. An outbreak of Shigellosis caused by contaminated food in a rural primary school, Sichuan, China, 2013

H. Chen, M. Wang, X. Zhou, L. Zhang and L. Liu

Background: On April 3, 2013, a township hospital in Sichuan province reported that there were >100 patients with diarrhea, vomiting and fever who came from a primary school in this township. We conducted an investigation to identify the agent, mode of transmission, and recommend control measures.

Methods: We defined a suspected case as a student or staff in the school with onset of diarrhea from April 1 to 6, 2013. A confirmed case was a suspected case with a positive *Shigella* stool culture. We searched for cases by reviewing medical records from hospitals and interviewing students and staff of the school. We compared food exposure at lunch on April 1 among 136 case-students and 69 control-students. We interviewed chefs about food preparation. Stool or rectal swabs were collected for *Shigella* culture.

Results: 264 case-students (attack rate: 34%) and 1 case-teacher (attack rate: 2.1%) were identified. The predominant symptoms were diarrhea (100%) and fever (86%). Students and teachers drank the same water. They had lunch at different cafeterias. The epidemic curve suggested a point-source with the exposure period at lunch on April 1. 91% of case-persons ate shredded potato compared to 62% of control-persons (adjusted OR=5.7, 95% confidence interval: 2.6-13). One chef developed diarrhea one month before but kept working. The chef mixed shredded potato with flavoring by hand rather than chopsticks. The dish was stored for three hours at room temperature before serving. Stool samples from 12 of 16 patients were positive for *Shigella sonnei* and presented PFGE homology.

Conclusions: This outbreak was likely caused by shredded potato contaminated by the chef. We recommended enhancing training of kitchen workers on proper food preparation and storage of food in a refrigerator.

Section 1: Food and waterborne diseases

P08. Prevalence and Antimicrobial Resistance of *Vibrio* spp. in Retail Shrimps - Hanoi, Vietnam, 2013

Vu Thi Thu Tra, P. Duangporn, N. P. Hong, S. Huehn and T. Alter

Background: *Vibrio* spp. are natural inhabitants of the aquatic environment. Among the members of the genus, twelve species have been reported to be pathogenic to humans and can cause foodborne infections. The objectives of this study was to investigate the prevalence and the antimicrobial resistance patterns of *Vibrio* spp. isolated from retail shrimps in Hanoi, Vietnam.

Methods: A total of 202 shrimp samples were collected from 52 retail markets in ten urban districts of Hanoi between January and April 2013. Bacterial isolation and identification were carried out according to the international standards of ISO/TS 21872-1:2007 (E) and ISO/TS 21872-2:2007 (E) with some modifications. Species confirmation was done by multiplex Polymerase Chain Reaction (mPCR) method. *V. parahaemolyticus*, *V. cholerae* and *V. vulnificus* isolates were tested for resistances using the disc diffusion method according to guidelines set by the Clinical and Laboratory Standards Institute.

Results: The most prevalent species detected was *V. parahaemolyticus* (95.5%), followed by *V. alginolyticus* (56.4%), *V. cholerae* (2%) and *V. vulnificus* (1.5%). Multiple *Vibrio* spp. were found in 114 (56.4%) samples. *V. parahaemolyticus* isolates showed a high rate of resistance against ampicillin (87.2%) while a moderate rate was observed for sulfamethoxazole/trimethoprim (18.5%). Only one *V. cholerae* isolate was resistant to ampicillin and two *V. cholerae* isolates resistant to sulfamethoxazole/trimethoprim were found. All of the *V. vulnificus* isolates (n=3) were susceptible to the eight antimicrobial agents tested. Among the three *Vibrio* species, multi-resistance was found only in *V. parahaemolyticus* (16.9%).

Conclusions: The present study has shown the evidence of hazard potential of shrimp containing potentially pathogenic *Vibrio* spp. Consuming raw or undercooked shrimp should be avoided to reduce the risk of *Vibrio* infection.

Section 1: Food and waterborne diseases

P09. Food Poisoning Outbreak in Sawangan Village, Magelang District, Central Java, Indonesia-2012

Riska Epina Hayu, H. Kusnanto, S. Darodjah and M. Kes

Background: On May 11, 2012, the Magelang District Health Department was informed of a cluster of 25 patients with gastrointestinal illness after attending a ceremony in the home of a resident. Since a food poisoning outbreak was suspected, an FETP team was sent to conduct an investigation to identify the source and recommend prevention and control measures.

Methods: We did a case-control study. There were 25 cases and 16 controls. Cases were guests who developed gastrointestinal signs and symptoms after the event. Controls were well attendees. Subjects were interviewed to obtain information on foods consumed. We also asked cases about onset of their illness, signs and symptoms experienced. Left-over food items were sent to a laboratory for testing.

Results: There were 41 guests during the ceremony of which 25 became ill (attack rate: 11.2%). The epidemic curve was that of a common source outbreak. Signs and symptoms of cases were diarrhea (76%), nausea (76%), abdominal pain (56%), weakness (48%), fever (40%), and vomiting (36%). Incubation periods ranged from four to nine hours (median: 6 hours). Cases were more likely than controls to have eaten chicken curry (OR 24, 95% CI: 2.4 – 1107.4) and sauce (OR 11.5, 95% CI: 1.67-124.22). Staphylococcal bacteria were found in the chicken curry.

Conclusions: This food poisoning outbreak was probably caused by contaminated chicken curry. To prevent future outbreaks, we recommended that cooks and food handlers practice good personal hygiene and safe food handling. Sick persons, e.g. with boils or sores, should avoid food handling.

Section 1: Food and waterborne diseases

P10. Hepatitis A Virus (HAV) Outbreak in Nanggulan sub-district, Kulon Progo Regency, Indonesia, 2012

Theodola B. Rahayujati, C. Indriyani and Y.G. Chandra

Background: Based on weekly reports from Nanggulan Public Health Center, many cases with clinical HAV symptoms were reported on the fifth week whereas previously there were no reports. This investigation was conducted to describe the cases, identify the source and recommend control measures.

Methods: A matched 1:1 case control study was done. Cases were persons who had one or more clinical symptoms (fever, malaise, anorexia, nausea, abdominal discomfort, low appetite, dark urine, yellow eye or jaundice) and HAV-IgM positive. Controls were matched by age and village without symptom or HAV-IgM negative. Data were analyzed using multiple logistic regression. An environmental survey was done by collecting samples from water sources and testing them in a lab.

Results: During the 5th to 20th weeks, we found 118 persons who had clinical symptoms but only 72 cases who were HAV-IgM positive were included for the analytical study. Most of the cases were men (64.41%), aged > 25 years (58.47%) and lived in Jatisarono village (49.2%). The major symptoms were low appetite (91.67%), malaise (88.89%), dark urine (87.5%), nausea (86.11%), dark eye (77.8%) and fever (76.4%). The risk factors were eating raw foods (OR: 3.368; 95% CI: 1.362-8.327), not washing hands before eating (OR:2.91; 95% CI: 1.186-7.143), eating outside one's home (OR:2.528; 95% CI: 1.085-5.368) and sharing cutlery (OR:2.413; 95% CI: 1.085-5.368). The index case was a waiter from a big restaurant at the sub-district with *E. coli* >1600 per 100 ml in the water source.

Conclusions: The HAV outbreak was related to some water and foods contaminated with feces. Risk factors included not washing hands before eating, sharing utensils and eating outside one's home. Improving personal hygiene by having a clean and healthy lifestyle was recommended for prevention.

Section 1: Food and waterborne diseases

P11. Foodborne Salmonella Gastroenteritis Outbreak in an Islamic Boarding School—Pondok Ranji, South Tangerang City, Banten, Indonesia, 2012

Aprinianis R.I. Bay

Background: In February 2012, health center staff were informed of a cluster of 12 diarrhea cases among female students of an Islamic Boarding School. We conducted an investigation to confirm the outbreak, identify the source and recommend appropriate interventions.

Methods: We did a case-control study. Cases were female students who had acute gastrointestinal illness. Controls were well female students from the same year level as the cases. Subjects were interviewed about the food items eaten on the 12th of February and any signs or symptoms experienced. We collected left-over food and water samples from the school for bacterial culture.

Results: Of 144 female students, 27 became ill (attack rate 19%). The highest attack rates (AR) were in Grade 3 JHS (AR = 37.14%) and grade 1 JHS (AR = 19.23%). Signs and symptoms of cases were diarrhea (86%), abdominal pain (96%) and fever (79%). Twenty-seven cases and 43 controls were interviewed. Among the food items consumed by the students, croquette with meat or risol (OR 3.33, 95% CI 1.05-10.63) and fried starch with vegetable and egg or cireng (OR 4.33, 95% CI 1.01-18.53) were associated with the illness. These food items were bought from the same food vendor and found to be positive for salmonella bacteria. Water samples were negative for bacteria.

Conclusions: The students probably had salmonella gastroenteritis acquired from eating contaminated food sold by the vendor. When students began to get sick, the vendor left the area. We recommended that school authorities advise students to avoid buying food items from ambulant food vendors as the safety of the foods sold by these vendors could not be monitored.

Section 1: Food and waterborne diseases

P12. Outbreak of Puffer Fish Poisoning – Kampong Chhnang Province, Cambodia, 2013

Sam Ath Saing, P. Has, H. Seng, C. Heng, A.E. Parry and R. Tsuyuoka

Background: Outbreaks of foodborne disease commonly occur in Cambodia; however, many are not investigated. In April 2013, local media reported two fatalities and several other illnesses after a small party in Preykri Tbong village, Kampong Chhnang Province. We conducted an outbreak investigation to identify the source and guide public health actions.

Methods: We reviewed hospital records of admitted attendees and interviewed medical staff. All attendees were interviewed using a standard questionnaire that collected demographic and clinical information, as well as food and drink items consumed at the party.

Results: All party attendees (N=15) reported neurological illness of varying severity and required hospitalization; two subsequently died. The median age was 31 years (range: 5 to 55 years). Neurologically-associated manifestations included numbness (87%), palpitation (80%), dizziness (73%), and difficulty breathing (67%); other symptoms consisted of headache (60%), muscle cramps (60%), vomiting (40%) and diarrhea (13%). All attendees consumed whole puffer fish, steamed rice and boiled water. Four (27%) attendees, but only one fatal attendee, also consumed rice wine. The median incubation period was two hours (range: 1 to 5.5 hours). Puffer fish were caught from a nearby lake and identified as *Monotrete leiurus*, a previously identified species with moderate toxicity. Fatal attendees consumed more fish (≥ 15 whole fish) than non-fatal attendees ($p < 0.01$).

Conclusions: Clinical illness was consistent with puffer fish poisoning. Several species of puffer fish are present in Cambodia, with consumption linked to severe and occasionally fatal disease due to heat stable neurotoxins. A public health campaign was conducted to educate residents on the identification and avoidance of puffer fish species. Efforts to further characterize puffer fish poisoning in Cambodia through surveillance and investigations are on-going.

Section 1: Food and waterborne diseases

P13. Prevalence and characterization of Salmonella in chicken meat from retail markets in Vietnam

Ta Thi Yen, N.T. Trung, T.B. Phuong, P.X. Da, L.T.H. Hao, N.T. Giang, W. Alali, I. Walls and M. Doyle

Background: Salmonella is one of the major foodborne pathogens that cause illness in humans. This study estimated the prevalence, determined serovars, and tested antibiotic susceptibility of Salmonella in raw chicken meat across six regions in Vietnam.

Methods: A total of 1,000 whole chicken carcasses were collected at wet markets, supermarkets in five cities and seven provinces in Vietnam. Salmonella positive samples were identified using USDA-FSIS methods.

Results: The prevalence of Salmonella in chicken meat was 46%. There was no statistical significance ($p > 0.05$) between study variables (city vs. province, wet market vs. supermarket, ambient vs. chilled). Serovars and antibiotic susceptibilities of 347 isolates were determined. Eighteen serovars were identified; the most common were Albany, Dabou, Agona, Hadar, and Indiana. The serovars, Typhimurium and Enteritidis which cause salmonellosis in humans were found on 7% and 2%, respectively. Fourteen antibiotics representative of 8 classes of drugs were used in this study. There was 71% resistance to one antibiotic, resistance to \geq two antibiotics was 52%, and only Salmonella serovar Indian resisted up to nine antibiotics.

Conclusions: The prevalence of Salmonella in chicken meat (46%, $n=1,000$) was higher than that reported in several previous studies in Vietnam. The Salmonella serovars Typhimurium and Enteritidis were determined in 38% and 13% from humans in previous study; they were also identified in 7% and 2% of raw chicken meat samples in our study. This reveals that chicken meat may be a source of human salmonellosis in Vietnam. Our findings suggest that a Salmonella surveillance program in Vietnam may provide information to assist in the reduction of Salmonella in poultry as well as to monitor antibiotic-resistance in Vietnam.

Section 1: Food and waterborne diseases

P14. Recent Trends of Food-borne Disease Outbreaks in Korea, 2007-2012: Which Pathogens and Foods?

Hyungmin Lee, S. Moon, I.W. Sohn, Y. Hong, J. Park, G.Y. Kwon, S. Lee and S. Youn

Background: Food-borne disease outbreaks (FBDOs) still remain an important public health problem. This study was initiated to investigate the trends in FBDOs in Korea and determine emerging or re-emerging causal pathogens and food vehicles.

Methods: By using the data of the FBDOs database in the Korean Centers for Disease Control and Prevention, we analyzed the characteristics of FBDOs in Korea, by year, location, causal pathogens, and causal food vehicles from 2007 to 2012.

Results: From 2007 to 2012, a total of 1,794 FBDOs and 48,897 patients were reported. The numbers of FBDOs decreased until 2011. However, in 2012, both FBDOs and patient numbers increased. The most common pathogens were norovirus, pathogenic *Escherichia coli* other than enterohemorrhagic *E. coli* (EHEC), *Salmonella* species, and *Vibrio parahaemolyticus*. These results highlighted the re-emergence of norovirus and pathogenic *E. coli* other than EHEC in schools in 2012. We also found that fermented pickled vegetables (FPV) were an emerging food vehicle responsible for FBDOs in schools.

Conclusions: This study showed that FBDOs in Korea decreased from 2007 to 2011, however, numbers of FBDOs and patient increased in 2012. Norovirus, pathogenic *E. coli* and FPV were associated with large scale FBDOs in schools. According to this study, we recommend intensified inspections of FPV manufacturers, especially the monitoring of underground water sources and ingredients and the strengthening of laboratory surveillance of relevant pathogens.

Section 1: Food and waterborne diseases

P15. A Gastroenteritis Outbreak Caused by *Salmonella enteritidis* Contaminated Food in Guangdong, China, 2013

Ming Zhao, G.J. Wu, Q. Huang and H.L. Ma

Background: On June 12, 2013, 40 gastroenteritis cases were reported from a factory in Guangdong, China. We conducted this investigation to identify the source of this outbreak and risk factors, and to recommend control measures.

Methods: We defined a suspected case as a factory worker with onset of one of the following symptoms: diarrhea (\geq three times/day), fever ($\geq 38.0^\circ\text{C}$), stomachache or vomiting from June 10-11, 2013. A confirmed case was a suspected case with positive *Salmonella enteritidis* culture. We enrolled all 59 cases and 136 healthy-workers matched with cases by plant, dormitory to compare exposures to eight meals and all food exposures of the implicated meal. We interviewed kitchen workers about food preparation. We collected rectal swabs to test for enteric bacteria. PFGE was done for positive samples (isolates). Ten foods were provided to workers for breakfast on June 10.

Results: Fifty-nine cases were found among 1,043 workers (attack rate: 5.6%). Ninety-eight percent (58/59) of cases had eaten the breakfast on June 10 compared with 74% of 136 controls (Fisher's exact test, $p < 0.001$). Among workers exposed to the breakfast on June 10, 67% (39/58) of cases ate fried rice with egg (FE) compared with 16% (15/96) of controls (OR=11, 95% CI: 5.1-24). Thirteen of the 14 rectal swab specimens were positive for *Salmonella enteritidis*, and the similarity of band in PFGE was 100%. Eggs were not completely in FE cooking process. Leftover food samples from the breakfast on June 10 were not available for testing.

Conclusions: This outbreak was likely caused by poor food handling practices which led to contamination of the fried rice with egg with *Salmonella enteritidis*. We recommended improving the awareness of good handling practices among kitchen workers of canteens.

Section 1: Food and waterborne diseases

P16. An outbreak of tetrodotoxin poisoning caused by consumption of marine puffer fish-Guangdong, China, 2012

Heng Zhang, Q. Huang, S. Li, H. Liang, L. Ma and L. Deng

Background: The fatality rate of reported tetrodotoxin poisoning is nearly 50% in China. The sale of puffer fish (PF) was banned in China in 2003. In August 2012, a PF-poisoning outbreak occurred among four families after ingesting home-cooked PF purchased in a three-coastal-village fair in Guangdong province. An investigation was conducted to verify and understand the cause of the outbreak.

Methods: We defined a case as any villager of the family that consumed PF in the three villages in the town between Aug 1 and 8, 2012, with \geq two of the following symptoms: dizziness, vomiting, orolingual numbness, muscular paralysis of the limbs, weakness of limbs, difficulty walking, or dyspnea. A retrospective cohort study among villagers in the three villages was conducted to identify risk factors of PF-poisoning. We selected 40 villagers at random among residents of the three villages. A self-administered questionnaire was used to collect information about PF.

Results: We identified 14 PF-poisoning cases (one case died) among 13 families who consumed marine PF (attack rate: 21%). There were no cases in the families without consumption of the fish. Fish flesh and fish liver that were cooked together was significantly associated with poisoning (RR=2.8, 95% CI=1.3-6.1); 73% (8/11) developed a case compared to only cooking flesh, 26% (6/23). Leftover fish was not available. The villagers of case-families identified *Gastrophysus lunaris* using pictures. Among 40 villagers, 38 (95%) knew that PF was poisonous. Meanwhile, 95% of people considered the puffer fish as a delicacy worthy to eat.

Conclusions: This outbreak was caused by poisonous PF consumption, with tetrodotoxin concentrated mainly in the fish livers. We recommend measures for awareness- strengthening and market surveillance.

Section 2: HIV, STI and blood-borne viruses

P17. Determinants of sexually transmitted diseases in Pematang Siantar City of North Sumatera

Desy Ari Apsari, Dame E. S. and Safrina R.T.

Background: Among patients with sexually transmitted diseases seen at the General Hospital Center H. Adam Malik, 29.9% were diagnosed with condyloma acuminatum, 28.4% with gonorrhoea, 7.5% with syphilis and 4.5% with herpes simplex. Simalungun health district reports showed 43 sex workers tested positive for HIV. This study was carried out to determine the determinants of sexually transmitted infections in the city of Siantar.

Methods: We did a cross-sectional study on 60 sex workers in Siantar City. Sampling method used was simple random sampling. Analysis of risk factors was done; chi square tests were done and 95% confidence intervals were calculated.

Results: Most (51.7%) sex workers suffered from sexually transmitted diseases (STD). Of those with STDs, 37.8% were suffering from early syphilis, 27% had gonorrhoea, and 8.1% had cervicitis and candidiasis. These results were obtained from the examination of vaginal fluid and serology. Determinants of disease were not wearing a condom (OR: 5.15), lack of use of health care facilities (OR: 11.7) and low socioeconomic status (OR: 4.76).

Conclusions: The emergence of sexually transmitted diseases in the city of Siantar was due to lack of utilization of health facilities and the use of condoms, therefore we recommended that health workers disseminate information on the use of condoms as well as improve the quality of services such as screening.

Section 2: HIV, STI and blood-borne viruses

P18. Effectiveness of harm reduction program among injecting female sex workers in select sentinel provinces in Viet Nam from 2010 to 2012

Bui Hoang Duc, T. Duong and H. Phan

Background: The annual HIV sentinel surveillance system in Viet Nam began to collect behavioral data from female sex workers (FSWs) in seven provinces in 2010, expanding to 12 provinces in 2011, and to 29 provinces in 2012. These data provide a better understanding of high-risk behaviors and linkage to HIV/AIDS services among target populations.

Methods: A cross sectional study was conducted annually in which 150 to 300 FSWs were recruited from each 40 province. There were 5466, 7983, 8140 FSWs sampled in 2010, 2011 and 2012 respectively. Following informed consent, respondents were interviewed with 20 to 30 behavioral questions and agreed to take a blood test for the presence of HIV antibody.

Results: A reported 7%, 3%, and 2.3% of FSWs used drugs, of whom 82%, 81%, and 70% had injected drug in the past month in 2010, 2011, and 2012 respectively. HIV prevalence among injecting FSWs was 29%, 22%, and 15.5% in 2010, 2011, and 2012 respectively. Accordingly, HIV prevalence among general FSW was 4%, 2.9%, 2.7% in 2010, 2011, and 2012 respectively. The range of FSW reporting knowing their HIV infection status was 40 – 60 %. Eighty to ninety percent of respondents used condoms in the last sex act with their clients. Among those FSW injecting drugs, 88% to 94% used clean syringe needles for last injection. Ten percent, 5%, and 9% of HIV-infected – injecting FSWs reported receiving ART in 2010, 2011, and 2012 respectively.

Conclusions: We recorded high percentages of use of condoms and clean syringe and needles among FSWs and injecting FSWs. Injecting drug use among FSWs while potentially decreasing is a serious risk for HIV transmission and should be addressed in FSW harm-reduction programs.

Section 2: HIV, STI and blood-borne viruses

P19. Risk factors for sexually transmitted infections among Indirect Female Sex Workers in Mataram City, Indonesia, 2012

Kadek Mulyawan

Background: Sexually transmitted infections are a public health problem in all countries, including Indonesia. The estimated number of people exposed to a sexually transmitted infection that can be treated approximately more than 30 million cases annually. In Mataram City, in 2011, found as many as 896 new cases of sexually transmitted infections. Indirect female sex workers have an important role in the spread of sexually transmitted infections and HIV-AIDS cases increased.

Methods: A cross sectional study of 66 indirect female sex workers was done. Risk factors of STIs examined were age at first sexual intercourse, time of having sex, number of clients per day, not using condom, cleaning hands after sex, changing underwear after sex, alcohol consumption habits and the drug use. Potential risk factors were explored using a structured questionnaire during the months of May to June 2012. Data were analyzed using bivariate and multivariable analyses.

Results: From the bivariate analysis, risk factors for STIs were time of having sex (PR 2.33, 95% CI 1.05 – 5.15), not using condoms (PR 3.13, CI: 1.36 - 7.20) and numbers of clients per day (PR 2.60, CI: 1.12 - 6.01). Multivariable analysis showed that the risk factors that influence the incidence of sexually transmitted infections are not using condoms and number of clients per day.

Conclusions: Not using a condom in serving clients of indirect female sex workers is a risk factor for STIs. There is a need to monitor the prevalence of sexually transmitted infections, continued cooperation and support of stakeholder to decrease the prevalence of STIs.

Section 2: HIV, STI and blood-borne viruses

P20. Risk Factors for Intrafamilial Transmission among HBsAg-positive Patients--Mataram City, Indonesia, 2011

Bai Kusnadi, Siti Nurdjanah and T. B. Rahayujati

Background: In Indonesia, the prevalence of HBsAg carriage ranged from 3%-17%. Until 1990, in West Nusa Tenggara (NTB), hepatitis B carrier rates ranged from 3.9%-20.3% and decreased to 1.4% -12.5% in 2002-2007. In the city of Mataram the prevalence of HBsAg carriage is around 10% (highly endemic). A study was undertaken to identify the risk factors.

Methods: We did a 1:1 case-control study among family members of HBsAg (+) patients in 2009 and screened in March-July 2011. Risk factors examined were the following: history of unsafe sexual intercourse, a history of sharing personal equipment (cutlery/drinking glasses, razors, toothbrushes, towels) and parents who are HBsAg (+). We interviewed 124 people. Data were analysed with Chi-square (X²) tests, and multiple logistic regression; odds ratios were calculated.

Results: Bivariate analysis showed a history of unsafe sex (OR = 2, 95% CI = 0.641-6.651), sharing of utensils/ drinking glasses (OR = 1.069, 95% CI = 0.489-2.340), razors (OR = 2.240, 95 % CI = 0.515-11.304), and towels (OR = 1.455, 95 CI% = 0.486-4.519) and sharing toothbrushes (OR = 1.000, 95% CI = 0.012-79.764) were not risk factors. Multivariate analysis showed unsafe sex (OR = 4.094, 95% CI = 1.275-13.140) and a history of parents being HBsAg (+) (OR = 7.743, 95% CI = 2.566-23.363) were risk factors for other family members being HBsAg+.

Conclusions: Unsafe sex with an HBsAg (+) partner and having HBsAg (+) parents were risk factors for intra-familial transmission of hepatitis B. We recommend that there be collaboration between the Mataram City Health Department, the health workers in the hospital and clinic, and the private sector to provide health care and education about hepatitis B for infants, children and vulnerable family members.

Section 2: HIV, STI and blood-borne viruses

P21. Regional variation of Hepatitis C Virus Infection in Korea

Geun-Yong Kwon, H. Lee, J. Gwack and S. Youn

Background: Hepatitis C virus (HCV) infection is a global public health concern due to its continued high prevalence and high potential for chronic disease. In Korea, HCV is included in the list of notifiable infectious diseases in the sentinel surveillance system. Recently a large variation of HCV incidence among regions has been noticed in Korea. This variation can cause a serious public health problem but, at the same time, it may give the key information for HCV prevention and control.

Methods: We counted the number of HCV patients who visited hospitals per county by using the national health insurance database 2006-2010. The prevalence rates, numbers of patients divided by population, of each county were calculated for inter-regional comparison. Disease mapping and spatial analysis were conducted using geographic information system.

Results: The annual medical prevalence rate of HCV was approximately 0.14% yearly in Korea. The absolute prevalence rate values were underestimated as only hospital visiting patients were included. There were not a lot of changes over time. The age-adjusted prevalence ratio of the province with the highest prevalence was 4.85 and that of the lowest was 0.20. The three regions in the southern coastal area of the Korean Peninsula were identified as a high prevalence cluster (Moran's Index = 0.36).

Conclusions: The present study showed that HCV has very large regional variations and there are several high risk areas. As in previous studies, intravenous drug usage and inappropriate invasive procedures are suspected to be causes of HCV clusters. Preventive measures focusing on these areas should be applied to block the transmission of HCV and decrease the disease burden.

Section 3: Non-communicable diseases, cancer and injury

P22. Risk Factors for Dyslipidemia among Adults (≥ 18 Years Old) in Bantul District, Indonesia, 2013

Desy Eliana, B. Murtiningsih, T. Bintarta and H. Santosa

Background: Dyslipidemia is a major risk factor for heart and blood vessel disease. Cardiovascular disease (CVD) morbidity in Bantul district reached 24,981 in 2011 and then increased to 43,861 in 2012. The number of dyslipidemia cases in Bantul district was 214 in 2012. The study was conducted to determine the risk factors for dyslipidemia in ≥ 18 years old people in Bantul District.

Methods: We did an unmatched case control study. Cases were ≥ 18 years old persons who were diagnosed with dyslipidemia according to the examination of peripheral blood. Controls were ≥ 18 years old persons who did not have dyslipidemia according to the examination of peripheral blood. The sampling method was consecutive sampling. Statistical tests used were chi-square and logistic regression with 95% confidence interval.

Results: The number of participants in this study was 200 cases and 200 controls. The risk factors associated with dyslipidemia were sex (OR=0.47; 95% CI=0.28-0.80), physical activity (OR=8.22; 95% CI=4.309-15.694), alcohol consumption (OR=6.75; 95% CI=1.901-23.974), smoking (OR=4.28; 95% CI=2.29-8.01), frequent consumption of high fat food (OR=11.46; 95% CI=6.39-20.54), low family income (OR=2.66; 95% CI=1.523-4.66), family history of CVD (OR=2.46; 95% CI=1.37-4.42). The following factors were not associated to dyslipidemia: age, employment status, educational status, frequency of eating/drinking sweet food and/or sugary drinks, frequency of eating salty foods, feelings of anxiety, abdominal obesity, BMI, and blood pressure.

Conclusions: Risk factors associated to dyslipidemia incidence in those ≥ 18 years old were sex, physical activity, alcohol consumption, smoking habits, frequent consumption high fat food, family income, and family history. Recommendation for the health department in Bantul was to promote increasing the community physical activity, reduce the smoking habit and consumption of fatty food.

Section 3: Non-communicable diseases, cancer and injury

P23. Risk Factors for Essential Hypertension in Young Adults--Banyudono Sub District, Boyolali District, Central Java Province, Indonesia, 2011

Herbert Wau, B. Djarwoto and T. B. Rahayujati

Background: Essential hypertension is one of the causes of death due to heart disease and is called a "silent killer." The prevalence of hypertension in the population over 18 years old in Indonesia is 31.7%. The proportion of new cases of hypertension among young adults in Boyolali in 2010 was 17.9% and most new cases (238) were seen at Banyudono I Health Center. We conducted this study to know the risk factors for essential hypertension among young adults in Banyudono sub district of Boyolali district.

Methods: We did a 1:1 matched case control study. The cases were essential hypertension patients who have been diagnosed by a doctor in the health center during the period January-September 2011, and controls were neighbors of cases that had not been diagnosed with essential hypertension. Data were analyzed; McNemar X2 test and conditional logistic regression were done. We computed for odds ratios (OR).

Results: The majority of subjects was aged 30-40 years, male, had an elementary and high school education and worked as farmers. Bivariate analysis showed that family history, obesity, alcohol consumption, smoking, less physical activity, psychosocial stress and excessive salt intake were significantly associated with hypertension with ORs ranging from 1.6 to three. The results of multivariate analysis showed the following to be risk factors for essential hypertension among young adults after adjusting for other variables: alcohol consumption (OR=2.01; 95% CI 1.234-3.285), excessive salt consumption (OR=1.98; 95% CI 1.269-3.119), less physical activity (OR = 1.87; 95% CI 1.203-2.924), and obesity (OR = 1.81; 95% CI 1.094-3.006).

Conclusions: Risk factors for essential hypertension in young adults are alcohol consumption, excessive salt intake, less physical activity and obesity. Our study emphasizes the importance of early detection of essential hypertension among young adults. Effective policy on health education and urgent precautions are needed. The precautions include a well-balanced diet, increasing physical activity and salt regulation.

Section 3: Non-communicable diseases, cancer and injury

P24. Smoking in Public Venues Following Implementation of National Smoke-free Regulations-- Nanjing, China, 2012

Jian Su, Y. Qin, H.L. Bao, T. Shen and M. Wu

Background: During 2010 in China, approximately 740 million nonsmokers were exposed to second hand smoke. On May 1, 2011, the China Ministry of Health implemented a regulation prohibiting smoking in public venues. In 2012, in Nanjing, Jiangsu Province, we conducted a survey to evaluate second hand smoke exposure in public venues.

Methods: We randomly sampled 137 restaurants, 16 hospitals and 21 internet cafes for on-site direct observation in one district. We recorded patron smoking and staff dissuading smoking during a 30 minute observation period; and observed the types of tobacco control measures found in each venue.

Results: Overall, 51% (95% confidence interval [CI] 43%-59%) of public venues had patrons observed smoking with internet cafes having the highest (95%) level (95% CI 86%-100%). The proportions of public venues that had staff observed dissuading smoking were 14% (95% CI 5.7%-23%) in restaurants, and 10% (95% CI 0%-24%) in internet cafes. In total, 99% (95% CI=98%-100%) and 94% (95% CI=91%-98%) of the public venues were free of tobacco advertising and tobacco sales, respectively, while only 37% (95% CI=30%-45%) had no-smoking signage and 59% (95% CI=51%-67%) did not provide cigarette ashtrays. Of these tobacco control measures, 70% (95% CI=63%-77%) of the public venues had three and more. Observed smoking in public venues with three and four tobacco control measures was less likely than among those venues with two or one measures (odds ratio [OR]= 0.41, 95% CI=0.19-0.90, and OR=0.12, 95% CI=0.05-0.32, respectively).

Conclusions: Cigarette smoking was common and dissuading smoking by public venue staff was low. Public venue smoking control measures were associated with less smoking by patrons of public venues and warrant further exploration as to their role in reducing second hand smoke exposure.

Section 3: Non-communicable diseases, cancer and injury

P25. The Association between Overweight and Obesity and Hypertension in Shandong Province, China

Xiaoning Cai, J.X. Ma and T. Shen

Background: Overweight and obesity are important risk factors for hypertension. In order to understand the magnitude of the association between overweight and obesity to hypertension in China, we studied this relationship among adults in Shandong Province, China.

Methods: In 2011, we conducted a cross-sectional, population-based representative survey of 15,350 adults, 18-69 years of age. Trained staff measured height, weight, waist circumference (WC), and blood pressure (BP) using standard methods. We used Body Mass Index (BMI) criteria to define normal weight ($<24 \text{ kg/m}^2$), overweight ($24 \text{ to } <28 \text{ kg/m}^2$) and obesity ($\geq 28 \text{ kg/m}^2$); waist circumference (WC) to define central obesity ($\text{WC} \geq 85 \text{ cm}$ men, $\geq 80 \text{ cm}$ women); and automated BP measurements and hypertension history to define hypertension ($\text{BP} \geq 140$ systolic or ≥ 90 diastolic, or medical history of hypertension).

Results: The prevalence of overweight and obesity were 33% (95% confidence interval [CI]:31-34%) and 17% (95% CI: 15-18%), respectively, and for central obesity the prevalence was 50% (95% CI:47-53%). The prevalence of hypertension increased from 13% (95% CI: 11-16%) among those with normal body weight to 28% (95% CI: 25-31%) and 46% (95% CI: 43-48%) among those who were overweight and obese, respectively. Compared to those with normal body weight, hypertension was two to almost six fold higher among those who were overweight and obese ($\text{RR}=2.1$, 95% CI: 2.3-2.0; $\text{RR}=3.4$, 95% CI: 3.9-3.0, respectively). The association between hypertension and WC followed a similar pattern as for overweight and obesity.

Conclusions: Overweight and obesity are strongly associated with hypertension. Hypertension prevention and control strategies should consider incorporation of obesity prevention and control strategies.

Section 3: Non-communicable diseases, cancer and injury

P26. The diet and nutritional status of children in Xuan Quang commune, Tuyen Quang province, Vietnam, 2012

Le Thi Huong, P. Le, C. Vu and H. Tran

Background: Proper nutrition in childhood provides the necessary requirements for development. Between the ages of 24-59 months, children start eating with their family and no longer receive special diets. As there have been no studies in Tuyen Quang province on the impact of diet on the nutritional status of children, this study aimed to evaluate the nutritional status and food intake of children in Xuan Quang, a rural mountainous commune in Tuyen Quang province.

Methods: A cross-sectional study of 237 children aged 24-59 months was conducted, comprising anthropometric measurements of all children and an interview of their mothers about food eaten in the previous 24 hours. Anthropometric data was used to determine malnutrition status and the food and nutrients intake data was analyzed and compared with Daily recommendations.

Results: Underweight, being stunted or wasted was identified in 25%, 30% and 9% of children respectively. The number of average main meals was three per day. The average proportion of protein, lipid and glucose in the children's diet was 17%, 20% and 63%. Food intake did not meet the daily recommendation for energy, lipid, glucose, vitamin A, iron and calcium. However, protein intake was sufficient.

Conclusions: The malnutrition proportion of children aged 24-59 months in the study area was higher than the national proportion. Energy and other nutrient intake of children did not meet the recommendations. It is recommended that mothers should be guided to build up model vegetable gardens and fish-raising ponds as well as be informed of the benefits of available nutritious foods for improving the quality of diets and their children's nutritional status.

Section 3: Non-communicable diseases, cancer and injury

P27. Willingness of women attending primary health centers to undergo screening for cervical and breast cancer--Villupuram district, Tamil Nadu, 2013

Senthil Kumar, P. Kaur, Shanmugapriya P.C. and M.V. Murhekar

Background: Cancer of the cervix is the leading cause of cancer among rural women in India. The Government of Tamil Nadu, India initiated an opportunistic screening program for cancer of the cervix and breast since 2011 in primary care settings. Program evaluation data suggested low participation in the screening program. We estimated the proportion of women willing to undergo cervical and breast cancer screening and to determine the factors associated with non-willingness to undergo screening in Primary health centers (PHC) in Villupuram district.

Methods: We did a cross sectional study among women aged ≥ 30 years attending 16 PHCs selected using cluster sampling design in Villupuram District, Tamil Nadu, India. We collected data regarding awareness of cancer screening, willingness to undergo the screening and reasons for non-willingness using semi structured questionnaire.

Results: Among 240 women participants, mean age was 44 years. Overall 29% were willing to undergo cervical cancer screening and 35% were willing for to undergo breast cancer screening. Lack of family history (OR:2.4, 95% CI:1.1-5.1), lack of awareness of cancer screening and treatment were risk factors for lack of willingness to undergo screening. Family history of cancer was an effect modifier, lack of awareness being risk factor among those with lack of family history of cancer (AOR: 2.0, 95% CI: 1.0-3.8) after adjusting for other factors in the analysis.

Conclusions: We observed low acceptance of cancer screening among women attending PHCs in Villupuram district. Lack of awareness of cancer treatment and screening in PHCs was a risk factor for not willing to undergo cancer screening. Family history of cancer was associated with screening acceptance. We need to improve awareness using mass media and community health workers and adopt innovative outreach strategies to improve the participation.

Section 3: Non-communicable diseases, cancer and injury

P28. Awareness about cervical cancer and utilization of screening for cervical cancer among female health care workers in a semi urban district in Tamil Nadu, India, 2013

Bella Devaleenal, T Bhatnagar, P Kamaraj, V Joshua and S Mehendale

Background: Awareness of the health professionals regarding early cancer detection is vital. We estimated the awareness of cervical cancer and utilization of cervical cancer screening by female health care workers (FHCWs).

Methods: We conducted a cross sectional survey among female Medical Officers and Staff Nurses (Group I- Facility based) and Community Health Nurses and Auxiliary Nurse Midwives (Group II-Outreach activities) aged ≥ 30 working in Primary Health Centers and Government Hospitals in Kancheepuram district, Tamil Nadu from January to March 2013. We used a pretested structured questionnaire for data collection. We considered awareness as adequate if they had scored $\geq 75\%$ for questions regarding cancer of the cervix and its screening. We compared the responses between the two groups using Chi-Square test.

Results: We interviewed 132 and 265 FHCWs in Group I and II respectively. The mean number of years of service was 10 (Group I) and 18 (Group II). Overall, 18% of FCHWs (42% in Group I, 6% in Group II) had adequate awareness. The recommended age for screening as ≥ 30 years was known to 80% (Group I) and 48% (Group II) ($p < 0.001$). Overall, 25% FHCWs had undergone screening (13% (Group I), 31% (Group II), $p < 0.001$). Self-motivation was the reason for undergoing screening in 82% (Group I) and 61% (Group II). In Group I and II, 39% and 16% couldn't mention any reason for non-utilization, 24% and 20% didn't have time to undergo screening.

Conclusions: Awareness about cancer of the cervix and utilization of screening was sub-optimal among FHCWs. Education of FHCWS with a focus to improve the awareness and utilization of cervical cancer screening need to be strengthened which might eventually play a bigger role in sensitizing the communities they serve.

Section 3: Non-communicable diseases, cancer and injury

P29. Occurrence of gender-based domestic violence against women and supportive services for the prevention and control of domestic violence in Long An province, 2012.

Ha Vo Van Anh, H.N. Le, D. N. Phung, N. T Dien, N. C. M. Nguyen, T. T. V. Nguyen

Background: Although the number of reported cases of domestic violence against women (DVAW) has been decreasing, the number of severe cases is increasing in Long An province in 2012. Women have the largest risk for domestic violence. We conducted a study to understand the perception about DVAW, describe strategies and services women used to prevent and control DVAW, their barriers and advantages, and determine the prevalence, frequencies of DVAW in Long An in 2012.

Methods: cross-sectional study on 380 married women, combined with group discussions and in-depth interviews on married men, women, and key informants.

Results: The overall lifetime prevalence rate of physical violence by husband in Long An is 6.8%, while the overall lifetime prevalence rate of sexual violence is 2.4%. Although four women were threatened by a weapon and six forced to have sex, key informants working in local Women Union perceived no DVAW victims in their community. DVAW was defined solely by physical violence, although the majority of men and women recognized its psychological impacts on women. Reconciliation and independence on finance are perceived to prevent and control DVAW. Of the 27 victims, none reported efforts by local authorities to help them against domestic violence.

Conclusion: The prevalence of women experiencing physical and/or sexual violence in Long An is low in compared with the National study finding on DVAW in 2010. Supportive services for victims and women against domestic violence were limited and women perceived them as a lack of supports. More participation of health sector and local authorities in the prevention and control of DVAW are recommended.

Section 3: Non-communicable diseases, cancer and injury

P30. Children's injury and prevention in Mongolia

Nansalma Conway

Background: Injury, poisoning and certain other consequences of external causes was one of the principal five leading causes of Mongolian children's morbidity and mortality. Particularly, outpatient injury and injury-related deaths were commonly distributed in younger children aged 5-14 years in Mongolia.

Methods: Age-specific morbidity and mortality rates of injury were calculated. Injury incidences were analyzed using a Chi Square test of Independence for multiple variables using the SPSS-18 software program (Arbuckle, 2007) to compare other independent variables.

Results: General background of all children's out-patient unintentional injury morbidity rates were 227.0 -387.2 per 10,000 population aged 5-19 years in 2007-2009. These rates were higher than adults (206.4 -305.1 per 10,000). Of children's injury deaths, 48.5% were among younger children aged 5-14 years. The recorded causes of all injuries were traffic (33.8%), drowning (14.1%), falls (12%), weather disaster (14%), and all other (26.1) during 2007-2009 (Mongolian Health Statistics, 2008-2010). Among 5-14 year-old children injured, cases of head injuries were 15.9-19.9% and bone fractures were 74.4-78.2%; while these rates were 15.39 – 20.78% and 71.5-74.5% among 15-19 year old children.

Conclusions: Injury is the main cause of children's hospitalization and death in Mongolia. Traffic- and swimming-related injuries were common; although falls and harsh weather related injury prevalence occurred commonly in Mongolian children. Thus, the effectiveness of injury prevention and risk factor-related alternative approaches of public health will be specific and powerful for reducing the definable determinants of injury.

Section 4: Nosocomial infections and antibiotic resistance

P31. An Outbreak Caused by Multi-drug Resistant Enterotoxigenic *Escherichia coli* among Neonates at a Maternal and Child Health Hospital--Sichuan Province, China, 2012

Wei Yuan, Xi Chen, Y Sun, L Liu, L Zhang and Y Pei

Background: On June 24, 2012, the Maternal and Child Health Hospital (MCHH) of Z city reported that it received 10 neonates within one month with severe diarrhea. We conducted this investigation to identify the source of infection and risk factors.

Methods: We defined a case as a neonate at the MCHH of Z city, Sichuan province with onset of watery diarrhea or bowel movement ≥ 7 times/24h. We conducted a 1:2 matched case-control study. We defined a control as a neonate without diarrhea who was hospitalized in the neonatal ward during a corresponding infected case's exposure period (12 to 48 hours before onset). Stool samples from patients were collected and tested for *Escherichia coli*, *Salmonella*, *Shigella*, et al. Milk powder and environmental swabs were tested for bacterial count, pathogenic *Escherichia coli*.

Results: We found 44 cases among 285 neonates in the MCHH. The attack rate was 15%. Matched case control study revealed the infection risk increased 4.6 fold for each liter of milk-powder fed by nurses (OR=4.6, 95% CI=1.4-15). Within most cases' (93%, 41/44) incubation period, we could find at least one case who was suffering from diarrhea. *Escherichia coli* O128:H45 with virulence gene *stx2b* was found in eight of 25 stool samples, and was resistant to amoxicillin, piperacillin, cefalotin, et al. In the MCHH's neonatal ward, bacterial contamination was greater than accepted standard levels and *Escherichia coli* was found on the surface of blue light treatment box, door and button of the warm box.

Conclusions: This outbreak was caused by multi-drug resistant *Escherichia coli* contamination, likely transmitted by nurses when they fed neonates. We recommended disinfecting the MCHH's neonatal ward and antimicrobial therapy with other drugs.

Section 4: Nosocomial infections and antibiotic resistance

P32. Case-case study on risk factors of recurrence and clustering of patients of Community-Associated Methicillin-Resistant Staphylococcus aureus (CA-MRSA) infections – Hong Kong, 2010-12.

Paul KM Poon, YK Wan, SK Chuang (Centre for Health Protection, Department of Health, HKSARG, China)

Background: In Hong Kong, annual number of CA-MRSA infections recorded has increased from 173 to 868 from 2007 to 2012. In 2010-12, percentages of recurrence increased from 0.9% to 6.0% and clustering infection ranged from 7.6% to 9.3%. This study aimed to identify risk factors of recurrence and clustering infection, therefore potential targets for disease control.

Methods: We reviewed all patient records from 2010-12. We defined recurrence as > one infection episode within 1 year and clustering as > one infection among people living together within 1 year. We retrieved data on risk factors concerning e.g. living environment, personal habits, preexisting illnesses etc. We excluded patients with missing data on risk factors or unknown “recurrence/clustering” status. We compared recurrent patients to controls with only one infection episode within 1 year and patients involved in cluster to those who were not. We used logistic regression to compute adjusted odds ratios (aOR) and 95% confidence intervals.

Results: Among 2061 patients identified, we excluded 521 (25.3%) with unknown “recurrence/clustering” status and 327 (15.9%) for missing data. Among 1213 patients included, 56 (4.6%) were recurrent, 114 (9.4%) involved in clusters, seven (0.5%) belonged to both groups. Patients in cluster were more likely to report contacts with skin lesions (aOR: 19.7, 12.3-31.7) and having domestic helper (aOR: 2.5, 1.6-4.0). Recurrent patients (aOR: 21.5, 6.5-71.5) and patients in cluster (aOR: 5.9, 1.56-21.7) were more likely being institutionalized.

Conclusions: We suggest presence of domestic helper; contacts with skin lesions and institutionalization are risk factors of recurrent or clustering CA-MRSA infections. We propose education on skin lesion management and to domestic helpers to reduce clustering. We recommend prospective cohort studies to investigate these factors, especially institutionalization.

Section 4: Nosocomial infections and antibiotic resistance

P33. An outbreak of nosocomial *Salmonella stanley* infection in a hospital-Henan, China, 2012

Guangzhi Li and Z. Xie

Background: In June 2012, four gastroenteritis cases of *Salmonella stanley* were reported from a pediatric ward in a hospital in Henan, China, compared to less than two of this same strain identified since a *Salmonella* surveillance system was developed in Henan Province in 2007. We investigated the outbreak to identify the risk factors for illness and recommend control measures.

Methods: We defined a suspect case as any inpatient in the pediatric ward of the hospital with diarrhea (\geq three times/24 hours) from January 1 to June 30. A confirmed case was a suspect case plus *Salmonella stanley* culture (+). We selected eight confirmed cases and 32 controls (1:4) randomly selected from the ward matched on the same date of hospitalization to compare their exposure histories.

Results: We identified nine confirmed cases. The median age was eight days (range: 4 days – 11 months). The main symptoms included diarrhea (100%) and fever (89%). There were and no deaths. Five of nine cases had been in the hospital from birth to onset of illness, diarrhea of the others occurred after 4 days of hospitalization, suggesting that infection occurred in the hospital. Seven of nine cases were in ICU. Logistic regression analysis showed that artificial feeding (ORMH= 16.5, 95% CI: 1.7-157) was associated with the illness. There was no isolation area and no faucet installed in the ICU and the staff washed hands using the same basin.

Conclusions: This outbreak of gastroenteritis of *Salmonella stanley* was very likely nosocomial infection. The transmission of infection was probably caused by contaminated hands of the staff in ICU. We recommended hospitals should strengthen hospital infection control measures according to national guidelines.

Section 4: Nosocomial infections and antibiotic resistance

P34. Prevalence of extended spectrum beta-lactamase producing enterobacteria in a healthy population, Ho Chi Minh City, Vietnam, 2013

Nguyen Do Phuc, L.H.N. Nguyen and A.D. Nguyen

Background: Extended spectrum beta-lactamase (ESBLs) are enzymes that promote resistance to antibiotics such as all penicillins, cephalosporins and monobactams (but not cephamycin or carbapenems). Enterobacteria that produce ESBLs have spread rapidly worldwide and therefore many common and life-threatening infections are becoming difficult or even impossible to treat. Therefore the aim of this study was to determine the prevalence of ESBL-producing enterobacteria in healthy individuals in Ho Chi Minh city, Vietnam.

Methods: A prospective, cross-sectional study was conducted from January to July in 2013 in Ho Chi Minh City. Stool samples were collected from healthy individuals aged 20-70 years in four districts, and were screened with CHROMagar ESBL (The Chromogenic Media Pioneer, USA) for ESBL-producing enterobacteria. Phenotypes of these isolates were confirmed by combination disc method.

Results: Of the 160 stool samples, 63% contained ESBL-producing enterobacteria. Of the 139 isolates (40 samples carried more than two isolates). *E. coli* predominated at 63%, followed by *Klebsiella* spp. at 35% and *Citrobacter* at 1%. District 3 had the highest prevalence at 73%, followed by Cu Chi at 70%, Tan Phu at 63% and District 6 at 48%.

Conclusions: This study shows that the prevalence of ESBL-producing enterobacteria was high in the healthy population in Ho Chi Minh City, ranging from 48-73% by district, with *E. coli* and *Klebsiella* spp. dominating. This high prevalence suggests that antibiotic resistance may be a problem in Ho Chi Minh City which means that the resistance has not only been confined in the hospital environments but also spread in the community. To prevent the continuing spread of resistance, antibiotics should be used appropriately and counterfeit products should be abolished.

Section 5: Respiratory diseases

P35. A description of the epidemiological and genetic characteristics of human metapneumovirus (hMPV) among hospitalized severe acute respiratory infection (SARI) patients - Hai Duong, 2009-2011

Nguyen Thi Thuong, T. Duong, N. Minh, V. Thiem, N. Khanh, D. Ha, H. Lien, B. Nhanh, P. Ngoc, T. Hien and N. Hien

Background: Human metapneumovirus (hMPV) is a newly discovered virus, belongs to Paramyxoviridae family, Pneumovirinae subfamily, Metapneumovirus genus, causes a wide clinical spectrum from mild respiratory infections to pneumonia or severe bronchitis among children and immunocompromised people, yet, there are no antivirals nor vaccine for this virus. Globally, epidemiological characteristics have been incompletely or not consistently described. Proteins F and G play essential roles in attachment and fusion with host cells during viral replication. Therefore, epidemiological and genetic analysis of these two genes contributes to knowledge and development of preventive or treatment strategies against hMPV.

Methods: We did a descriptive study among hospitalized SARI patients using investigation forms. Laboratory techniques used were RT-PCR multiplex, hemi-nested monoplex, and sequencing.

Results: Of 1,273 samples tested, 63.3% were positive for viruses and hMPV accounted for 5%. Results were consistent over 2.5 consecutive years: distribution peaked significantly in March-April, ranked the highest among 0-5 years age group (cumulative incidence was 55.8/100,000 children [95% CI = 26.2-85.4/100,000]), Male/Female = 1.5 ($p < 0.0005$), and up to 53.1% of hMPV infections were co-infected with at least one among 10/18 respiratory viruses including pandemic H1N1, strongly correlating with viral distribution ($R=0.95$). Genetic analysis of G and F genes revealed a high diversity of G but the same clustering of lineage A2b, sub-genotype B1 and B2, of which B2 and A2b were predominant (>92.9% for both genes). There was a shift from B2 in 2009-2010 to A2b in 2011. These sequences have the most homology with those reported at the same period in Asia.

Conclusions: hMPV is an important cause of respiratory infection among 0-5 year old SARI patients and is seasonally distributed. Genetic analysis may contribute to molecular epidemiological surveillance and pathology studies, antibody treatment, and vaccine design in the future.

Section 5: Respiratory diseases

P36. Clinical manifestation and treatment outcome of HIV associated tuberculosis (HIV-Tb) by housing status

Hee-Sung Kim and H-S. Shin

Background: Unstable housing presents a unique challenge for HIV-Tb patients. We aimed to compare clinical manifestations of HIV-Tb by housing status and examine the effects of housing status on health behavior and treatment outcome.

Methods: This study included HIV infected patients who underwent Tb treatment at the National Medical Center in the Republic of Korea between January 2004 and February 2011. We compared clinical manifestations and treatment outcomes by housing status. Multivariate logistic regression analysis assessed risk factors for treatment outcome.

Results: Of the 107 HIV-Tb cases included in this analysis, 47 were unstably housed cases. Continued smoking and alcohol use after diagnosis of Tb were more common among unstably housed patients (64.3% vs. 37.9%, $p=0.009$ and 54.8% vs. 32.8%, $p=0.020$, respectively). Unstably housed patients had longer symptom duration before diagnosis of Tb (30 days vs. 18 days, $p=0.006$). In this group, isolation of M. tuberculosis by culture and pulmonary involvement were more common (74.4% vs. 52.9%, $p=0.032$, and 93.6% vs. 76.7%, $p=0.017$, respectively). Unstably housed patients had lower treatment completion rate (47.7% vs 65.0%, $p=0.036$). Unstable housing and pulmonary Tb were associated with delayed entry into medical care (OR=6.97 and 4.15, 95% CI: 1.84-26.37 and 1.22-14.07). Neuropsychiatric disease, unstable housing and past Tb were associated with default (OR= 13.1, 3.62 and 0.13, 95% CI: 2.04-83.99, 1.04-12.62 and 0.02-0.89).

Conclusions: Patients with unstable housing seemed to be more contagious since they have higher prevalence of pulmonary involvement and culture positive rate. Because treatment default and delayed entry into medical care were common in those patients, collaboration between public health authorities and medical care providers should be made for early detection and treatment adherence of HIV-Tb patients.

Section 5: Respiratory diseases

P37. Evaluation of Tuberculosis Surveillance and Action Performance in Sarikei, Sarawak

Hasrina Hassan and A. Kiyu

Background: Evaluating the tuberculosis (TB) surveillance system and action performance are necessary to ensure the disease is surveyed and acted upon effectively and efficiently. In view of increasing trend of TB cases and deaths in Sarikei, we evaluated the TB surveillance system and action performance.

Methods: A cross sectional study was carried out to identify all TB cases in 2011 in hospitals, clinics and laboratories in Sarikei that tested or diagnosed TB. Eighteen of 74 (24%) notification forms were randomly selected and examined for data quality and timeliness. Eighteen key informants completed a questionnaire assessing the attributes of the notification system. Health inspector and laboratory records were examined for performance in detection and confirmation.

Results: All TB cases (N=124) were reported and 88.7% (110 cases) were notified within seven days upon diagnosis. Data quality was poor, only 66.7% (12 notification forms) were complete. All (N=18) key informants found the system simple and 83.3% (N=15) were satisfied with the system. Only 2.4% (79 of 3,343) of sputum screened were found positive for TB. Case to contact ratio was on average 1:5. Screening of contacts detected only 0.26% (2 of 769) positive for TB. At the divisional level, data was minimally used for planning prevention and control of tuberculosis.

Conclusions: Notification and its timeliness were good. Nevertheless, data quality needs to be improved for it to be useful for case investigation and screening of contacts. New strategies are needed to improve the yield from sputum screening and screening of contacts. Data collected need to be analyzed for strategic planning of tuberculosis management. This can enhance the effectiveness of tuberculosis prevention and control measures in Sarikei.

Section 5: Respiratory diseases

P38. Relationship of Exclusive Breastfeeding and Incidence of Pneumonia among 12-23 month old children in Cimahi City, West Java Province, 2012

Saleh Budi Santoso and Helda

Background: Pneumonia is the leading cause of death in children worldwide. Definite risk factors that contribute to them are children under five who are not exclusively breastfed. The purpose of this study is to determine the relationship of exclusive breastfeeding on the incidence of pneumonia among children under five (aged 12 -23 months) after controlling for confounders.

Methods: A 1:1 case-control study was conducted in three catchment areas of public health centers in Cimahi City with the highest incidence rates of pneumonia among children less than five years in 2012. Cases were children aged 12-23 months who visited the research public health centers during the period of January to December 2012 and were diagnosed as pneumonia cases. Controls were neighbors of the cases. Minimum sample size for each group was 133. We did multivariate analysis using logistic regression.

Results: Children under five who were not exclusively breastfed had a higher incidence of pneumonia [OR 3.58; 95% CI: 2.08 to 6.19] than those who were breastfed exclusively after controlling for confounders.

Conclusions: This study reinforces previous research that proves the strength of association of exclusive breastfeeding on the incidence of pneumonia in infants. Focusing on areas with a high incidence of cases of pneumonia, the health department and public health center could further enhance the promotion and facilitation of exclusive breastfeeding, creating a smoke-free area at the household level, reduction in exposure to combustion fumes in the house, increasing maternal knowledge of risk factors associated with pneumonia.

Section 5: Respiratory diseases

P39. Investigation of severe neuro-respiratory disease among children in Cambodia, 2012

Vannara Hoy, P. Has, V. Som, S.D. Yi, B. Sor, N. Chea, M.C. Roces, N. Asgari-Jirhandeh, T. Wakui, Y. Arima and A. Tarantola

Background: In June 2012, a paediatric hospital in Cambodia reported 61 children admitted during the past two months with undiagnosed severe disease; 60 of who died. The disease started with fever followed by respiratory and/or neurologic signs and symptoms with rapid deterioration leading to death. A joint investigation team was assembled to describe the clinical and epidemiologic characteristics of the cases, confirm the diagnosis, and recommend appropriate public health action.

Methods: We searched for patients aged less than 12 years admitted to five major public hospitals with fever, neurologic and respiratory signs and symptoms with rapid deterioration within seven days of illness onset. Hospital records were reviewed and patients' guardians interviewed. Throat and rectal swabs and cerebrospinal fluid from patients were sent for testing at Pasteur Institute.

Results: Between April and July, 61 cases were admitted, 56 died and three had unknown outcomes (CFR 97%). The median age was two years (range: 3 months – 11 years); 55% were male. Cases came from 14 of 24 provinces. Sixteen cases had samples collected; 14 (87.5%) were positive for Enterovirus 71 (EV71). Genetic sequencing revealed the strain was of C4 genotype.

Conclusions: The clinical picture of cases was that of severe neuro-respiratory disease due to EV71. Selection bias may partly explain the high case fatality rate seen among the hospitalized cases. Enhanced surveillance was then created for Hand, Foot and Mouth Disease. Health centers were asked to report mild disease; surveillance for severe disease was set up at five sentinel sites. Clinicians were trained and advised to avoid steroid treatment for such cases and education campaigns for the public were conducted. By October, the CFR for confirmed severe EV71 infections was 23.5%.

Section 5: Respiratory diseases

P40. Outbreak of mycoplasmal pneumonia at a middle boarding school--Jinghua City, Zhejiang, China, 2013

Heng Zhang, J. Cai, F. Pang, F. Cheng, Y. Xie, M. Zhang and L. Ma

Background: Mycoplasma pneumoniae (MP) infection is predominantly a febrile respiratory infection causing about 20% of pneumonias. On May 29, 2013, a hospital notified us of a cluster of pneumonia patients, of whom were students in a senior high school of Jinhua city. We conducted this investigation to identify the cause of the disease and transmission mode of this outbreak.

Methods: We defined a suspected case as a student, teacher and staff in this school who had cough with any one of the following symptoms: fever ($>37.50C$), sore throat, headache or malaise, and with pulmonary inflammatory change by CT or chest radiography, or MP antibody positive during April 1 and June 5. We searched for cases by reviewing school clinical records and interviewing students and teachers. A retrospective cohort study was conducted in three classes with higher attack rates. Blood sera were collected for pathogen detection. Serological screening for MP was performed with Serodia Myco II gelatin particle agglutination test.

Results: We identified 43 cases with a school attack rate of 1.6%. 38 cases (88%) were found positive for M. pneumoniae. Cases were mainly distributed among Xinjiang students in preparatory class 1 and class 2 (38 cases, attack rate: 46%), and the attack rates ranged from 2.1% to 4.2% among other classes. The geometric average serological antibody level of MP in Xinjiang students was higher than the native students. The cohort study showed that students who had a cold in recent two months (RR=3.3, 95% CI=1.2-9.2) and previous contact with similar cases (RR=6.3, 95% CI=2.5-16.1) were risk factors.

Conclusions: Previous close contact with cases was possibly associated with this MP outbreak. We recommended that the school implement health education to boost students' health awareness and strengthen the ventilation and disinfection.

Section 5: Respiratory diseases

P41. Review of Sentinel Surveillance and Hospitalization Burden of Severe Acute Respiratory Infection (SARI) in Lao PDR, 2011-2012

Phonthavy Khodsimeug, M. Phengxay, P. Ketmayoon, A. Khamsing, O. Kheosavanh, P. Ounaphom, A. Corwin, and H.C. Lewis

Background: Severe acute respiratory infections (SARI) are a leading cause of morbidity worldwide and a significant cause of mortality in children <5 years. Following reports of Avian Influenza A/H5N1 and pandemic A/H1N1 2009 in Lao PDR, SARI surveillance was started in 2010 and includes five sentinel sites. We undertook analysis of SARI surveillance data for 2011-12 in order to describe the disease burden and make recommendations for surveillance and response.

Methods: A descriptive retrospective study was undertaken. Epidemiological (aggregate and case report form) and laboratory data from all cases meeting the SARI case definition (Fever of $\geq 38^{\circ}\text{C}$ + cough or sore throat + shortness of breath or difficulty breathing + inpatient) in 2011-12 were validated from two sentinel hospitals - Setthathirath hospital in Vientiane Capital and Oudomxai provincial hospital. Data were analyzed in Excel and Epi-data by time, place and person.

Results: Six percent (675/14,703) of inpatients were SARI cases, with a higher proportion in Oudomxai provincial hospital compared to Setthathirath hospital (7.3% vs. 2.7%). Cases were detected year-round with no distinct seasonality. Age-groups most affected were 0-2 years (58%) and >65 years (15%). Specimens were received from 18% (n=122) of SARI cases. The great majority (93%) of SARI cases tested were negative for influenza virus.

Conclusions: This is the first analysis of SARI data in Lao PDR and shows a significant disease burden, particularly in Oudomxai. Young infants and the elderly are most at risk. Of importance, the etiology of most cases could not be determined. Ongoing SARI surveillance with increased specimen collection, and testing for pathogens other than influenza, are needed to better understand SARI in Lao PDR and enable targeted control measures.

Section 5: Respiratory diseases

P42. The Relationship between Housing Conditions and Adult Tuberculosis in Ciamis District, West Java, Indonesia

Hikmat Syah

Background: During the past five years, the number of tuberculosis (TB) cases have been increasing in Ciamis District, West Java, with a prevalence in 2012 of 85.1/100,000 population. As of 2011, only 55% of residents had adequate or good housing conditions. We conducted this study in 2012 to determine if there was a relationship between housing conditions and tuberculosis among residents aged ≥ 15 years.

Methods: We did a case-control study among suspect TB patients aged ≥ 15 years consulting at Public Health Centers (PHC) in the district from January to December 2012. Cases were patients who were confirmed smear positive cases while controls were patients with negative sputum smears. Cases and controls were selected from all PHCs at Ciamis District using probability proportional to size to get the sample size of each PHC and simple random sampling to get the actual sample from each PHC. Data were analyzed by using univariate, bivariate and multivariate analyses.

Results: The study sample consisted of 256 respondents; 128 cases and 128 controls. Physical condition of houses had a significant association with the occurrence of tuberculosis ($p = 0.0001$; OR = 2.82; 95% CI: 1.57 – 5.08) after controlling for confounders like knowledge, education, house of contact and type of cooking fuel. Respondents with bad housing conditions had a 2.8 greater risk of getting infected with tuberculosis compared to the respondents with good housing conditions.

Conclusions: There is a need to promote better housing conditions to minimize the spread of tuberculosis.

Section 6: Vaccine preventable diseases

P43. A Measles Outbreak at a Private Welfare Centre, Kuala Lumpur, February 2012

Rohani HJ Ismail, U. Noorhaida, H.M.Y. Nurul and H. Sarah

Background: Measles incidence in Kuala Lumpur (KL) increased tenfold from 2006 to 2011. The immunization coverage was 86.7% compared to standard > 95%. Early February 2012, the State Health Department KL received notifications regarding few measles cases detected among residents of a welfare center. An investigation was conducted immediately to verify the outbreak and identify the source for preventive and control measures to contain the outbreak.

Methods: A cohort study was carried out. Cases were defined as individuals staying at the welfare center with history of fever and rash with conjunctivitis, coryza or cough, from February 2012 with confirmed measles and epidemiological linkage. All residents were interviewed using a standard questionnaire. Blood samples were taken for serology confirmation and viral isolation. An environmental assessment was conducted.

Results: A total of 33 at risk residents were identified and 17 of them fulfilled the measles case definition (attack rate 51.5%). Ages of cases ranged from six months to 14 years with a median of six years. The index case contracted measles two weeks before the outbreak. Five out of eight samples (62.5%) were measles IgM positive. Contributing factors were non-immunized status (100%, $p < 0.05$) and failure in isolation of cases.

Conclusions: Non-immunized residents and low immunization coverage in the operational area caused low "herd immunity" resulting in measles outbreak in the center. Fifteen residents aged six months to 15 years were given measles vaccination. Isolation room was set up to isolate the infected children. Defaulter tracing and mopping of eligible children for immunization were done to improve the immunization coverage.

Section 6: Vaccine preventable diseases

P44. An investigation of a measles outbreak in a county--Hubei, China, 2012

Qin Da

Background: China has a goal of measles elimination by 2015. Ninety-nine measles cases were reported to the disease surveillance system in December 2012 from a county in Hubei. We conducted this investigation to identify the risk factors for measles transmission.

Methods: We analyzed all the 99 measles cases reported to the surveillance system and got their vaccination information by reviewing the immunization register system. We interviewed 85 cases we could contact by telephone to obtain history of using healthcare facilities 7-21 days before onset. We randomly selected 85 controls individually matched by sex, age group and location from the immunization register system. We compared healthcare facilities exposure between cases and controls.

Results: Among 99 cases, six were >30 years old, 17 were aged <8 months, 76 were aged from eight months to six years. The incidence was 81/10,000 in children aged <8 months (the minimum age for vaccination), 36/10,000 in children aged 8-23 months, 7/10,000 in children aged 2-6 years in December 2012. Among 76 patients aged eight months to six years, 76% were unvaccinated indicating an estimated vaccine coverage of 86% assuming a measles vaccine effectiveness of 95%. During 7-21 days before onset, 46% (39/85) of cases had healthcare exposure compared to 9.4% (8/85) of controls (Odds ratio=8.2, 95% confidence interval: 3.3-21).

Conclusions: Estimated vaccine coverage was insufficient for measles elimination. Healthcare-associated infection was a risk factor for measles transmission. We recommended that the health department increase the vaccine coverage and healthcare facilities should strengthen hospital infection control measures for prevention of measles transmission.

Section 6: Vaccine preventable diseases

P45. Mumps Vaccine Effectiveness in an Outbreak in a Kindergarten, Langzhong, Sichuan Province, China, 2012

Yajun Sun, W. Yuan, Y. Cao, G. Fang and L. Zhang

Background: On June 6, 2012, the disease surveillance system reported 54 mumps cases from a kindergarten in Langzhong, Sichuan province. We conducted this investigation to evaluate mumps vaccine effectiveness.

Methods: A case was defined as a child or teacher in this kindergarten with acute onset of unilateral or bilateral tenderness or swelling of the parotid or other salivary gland, lasting \geq two days between January 1 and June 19, 2012. We searched for cases by interviewing teachers, reviewing surveillance records and a self-administered questionnaire. Vaccination histories were obtained from vaccination records. A retrospective cohort study was conducted in eight classes with attack rates (AR) $>10\%$. Risk ratio (RR) was calculated by comparing ARs between vaccinated and non-vaccinated students. Vaccine effectiveness (VE) = $(1-RR)*100\%$.

Results: The AR was 23% (78/341) in the eight classes, compared to 12% (135/1,112) in the kindergarten. The AR was 18% (40/217) among children who had received one dose (RR=0.40, 95% confidence interval [CI]=0.26-0.62) and 13% (5/38) among children who received two doses (RR=0.29, 95% CI=0.12-0.72), compared to 38% (33/86) among unvaccinated children. Overall VE was 60% (95% CI=38%-74%) for one dose and 71% (95% CI=28%-88%) for two doses. VEs of one-dose and two-dose vaccinations were 78% (95% CI 35%-93%) and 87% (95% CI=12%-98%) within three years respectively after vaccination, which decreased to 58% (95% CI=31%-75%) and 66% (0-92%) 3-5 years after vaccination, and declined to 36% (95% CI=0-66%) and 26% (95% CI=0-82%) over 5 years after vaccination, respectively (p for linear trend <0.05 for 1/2 doses).

Conclusions: Both effectiveness of one-dose and two-dose mumps vaccination are not high enough to prevent mumps occurring in a community and decreased with time. We recommended developing more efficient mumps vaccine and adjusting the vaccine strategy.

Section 6: Vaccine preventable diseases

P46. Outbreak of Pertussis in Savannakhet Province, Lao PDR, 2012

Nouda Prasith, P. Khodsimeug, K. Lauglath, M. Phengxay, C. Winter, S. Houadthongkham, Z. Phanoula and A. Gonzalez

Background: Pertussis is a highly contagious, but vaccine-preventable respiratory disease caused by the bacterium *Bordetella pertussis*. Pertussis outbreaks had occurred in Laos in recent years. On March 15, 2012, Savannakhet Provincial Hospital reported that one child was admitted with paroxysmal coughing and other children in the same village had similar symptoms. We initiated an investigation to describe the suspected outbreak, to identify its cause and implement control measures.

Methods: We conducted active case finding in the outbreak village, neighboring villages and health facilities. The following case definitions were used: suspected case was a person from the affected district with coughing of any duration with onset after February 1, 2012; probable case when coughing for more than two weeks and a laboratory-confirmed case when anti-pertussis IgA antibodies were detected. Identified cases or their caretakers were interviewed and information on demographics, symptoms and vaccination status were collected. We took 18 blood samples for serology testing and performed descriptive analysis using Excel. Diphtheria-Tetanus-Pertussis (DTP)-HepB-Hib vaccinations, Vitamin A and erythromycin were administered and respiratory hygiene education provided.

Results: In total, 175 cases (no deaths) were identified with onset of symptoms between February 2, 2012 and March 23, 2012: 110 suspected (63%), 49 probable (28%) and 16 laboratory-confirmed cases (9%). Male-female ratio was 2.6. Sixteen of 19 infants (84%), 17/23 of children aged 1-<2 years (74%) and 42/57 of children aged 2-<5 years (74%) were affected. DTP vaccination coverage was low, e.g. 8/23 (35%) of children 1-<2 years had received all three required DTP doses.

Conclusions: This pertussis outbreak mainly affected young children and was likely caused by low DTP vaccination coverage. It demonstrates that routine childhood DTP vaccinations need to be strengthened in Laos.

Section 6: Vaccine preventable diseases

P47. Pertussis Cases and Deaths at the Philippine General Hospital: What is wrong with Pertussis Immunization? - Philippines, 2013

Ruth Alma A. Ramos, P.K. Ching, R.J. Ventura, V.C. delos Reyes, M.N. Sucaldito and E.A. Tayag

Background: An increasing number of pertussis cases and deaths admitted at the Philippine General Hospital were reported to the National Epidemiology Center. We conducted an epidemiologic investigation to verify the diagnosis, profile cases and deaths and determine the mode of transmission.

Methods: A case series was done. Hospital records of cases were reviewed. Contact tracing of caregivers of cases was done. Nasal swabs were collected from both cases and contacts and sent to the national reference laboratory for confirmation.

Results: A total of 21 cases were identified. Ages of cases ranged from five weeks to four years (median: seven weeks); 57% were female. Majority (52%) were from Metro Manila. Of the 17 (80%) cases eligible for DPT vaccination, six (29%) had pertussis vaccination. Vaccination was deferred among 11 (52%) eligibles because of cough. Twenty (95%) were exposed to household members with history of cough. All (100%) cases presented with paroxysmal cough with cyanosis. Other presenting signs and symptoms were: respiratory distress (76%); seizure (24%) and posttussive vomiting (14%). There were 11 deaths with a case fatality rate of 52%. Six (54%) died of Respiratory Failure. Nineteen (90%) were positive for *Bordetella pertussis*.

Conclusions: There were a high number of cases and deaths among young infants without pertussis vaccination. Catch up vaccination among missed and defaulter children were started. Chemoprophylaxis was initiated among contacts to prevent the spread of the disease.

Section 6: Vaccine preventable diseases

P48. Setting-up a new assay for identification of efficacy of measles vaccine produced in Vietnam

Nguyen Thi Thuong, N. Hien, H. Lien, N. Hien, P. Ngoc and T. Hien

Background: It is difficult to overestimate the importance of vaccine and to imagine a society without it. The ongoing and rapid changes in vaccine science and advances in laboratory technology have led to a parallel development of vaccine quality control methods. We set up a new assay to identify rapidly the potency of live measles vaccine at molecular level with automation.

Methods: This was an applied study using Real-time RT-PCR quantification of RNA viral load intracellular infected Vero cells. Vero cells were inoculated in duplicates with reference and three final products of live measles vaccine produced in Vietnam at 10-fold dilutions from undiluted to 10⁻⁴. RNA within infected cells trypsinized or lysed by rapid lysis buffer (TpLR) was extracted at 24h, 48h, and 72h post-inoculation by commercial kits, and harvested directly using only TpLR. PFU and TCID₅₀ were identified at 72 hours.

Results: RNA could be quantified 24 hours post-inoculation at until 10⁻² and data fell into the linearity range of standard curve (10E¹-10E⁴). RNA titers seemed to reach plateau phase and out of linearity at 48 hours. RNA harvested by TpLR strongly correlated with and there was no absolute difference from that extracted by commercial kit ($R > 0.97$) and was stable after one year at -80°C. Repeatability within and between runs was 0.8% and 2.1%, respectively.

Conclusions: We established a new assay to identify the potency of live measles vaccine by quantification at 24 hour post-inoculation of RNA viral load intracellular Vero cells infected with only one vaccine dilution of 10⁻¹. Like gold standard methods, this new approach also identified the non-mechanistic correlate of protection (nCoP) of measles vaccine, however, had advantages in terms of accuracy, time, simplification, automation and cost effectiveness.

Section 7: Vector borne diseases

P49. Clinical and epidemiologic features of murine typhus–Korea, 2001-2012

Yeo-won Jin, J. Gwack and S. Youn

Background: Murine typhus, also known as endemic flea-borne typhus, is an acute febrile illness resulting from infection with *Rickettsia typhi*. This zoonotic disease is distributed worldwide; in Korea, 9-87 human cases have been reported annually over the past 12 years. We have been carrying out epidemiological surveys for all cases to strengthen public health.

Methods: Using surveillance data of 456 cases of murine typhus that have been collected by the communicable disease surveillance system of Korea Centers for Diseases Control and Prevention from 2001 to 2012, we demonstrated common presenting signs and symptoms and epidemiologic features, including morbidity and risk factors.

Results: The most commonly reported clinical signs were fever (84%), chills (52.8%), myalgia (47.2%), headache (45.1%), and rash (31.3%). There were neither severe cases nor cases of death with complications. A considerable number of cases were in the older population (61.2% > 60 years) who are living in the rural area or suburb and have little exposure chance of infection because they do seldom outdoor activity. Cases reported intensively on October (38.2%) and November (34.2%) both.

Conclusions: These findings show that murine typhus cases, reported in Korea, present typical acute febrile illness symptoms without severe complications and have similarity with previous studies as epidemiologic characteristics. However we still do not fully understand how old adults who stay at home all day acquire the disease. Therefore, we need to conduct further studies to clearly figure out risk factors of murine typhus for prevention of potential public health threat.

Section 7: Vector borne diseases

P50. Dengue Epidemic--Lao People's Democratic Republic (Lao PDR), 2013

Khansay Sengsayi, B. Khamphaphongphane, V. Kittiphong, N. Chanthakoummane, P. Vongphrachanh, B. Phommasak, A. Corwin, M. Phengxay and D. Luo

Background: Dengue is endemic in the Lao People's Democratic Republic. Dengue cases have exceeded the epidemic threshold since January 2013. The epidemic curve showed a peak at Epi-Week 28 with a downward trend in later weeks. The aim of this summary was to describe the 2013 dengue epidemic in Lao PDR.

Methods: Suspected dengue cases based on clinical symptoms that met any of the three categories of dengue case definition were reported nationwide to the National Center for Laboratory and Epidemiology (NCLE) on a weekly basis. Additional aggregate data were collected for further analysis to understand the picture of risks and to provide recommendations. Samples were collected from sentinel sites and clusters for confirmation of diagnosis by Enzyme-Linked Immunosorbent Assay-ELISA and Polymerase Chain Reaction-PCR methods.

Results: A total of 32,709 cases and 78 deaths were reported (case fatality rate-CFR 0.25%) as of Epi-Week 31. All age groups were affected; majority were under 30 years of age with females appearing to outnumber males. The majority [48/78 (61.5%)] of deaths were reported from Champasack (n=30) followed by Vientiane Capital (n=18); and most of the fatalities were under 20 years of age and predominantly males. Median and mode between symptom onset and first presentation to hospital was four days. Laboratory surveillance confirmed all serotypes were circulating with serotype 3 predominating in Vientiane Capital. The response has been taken in the areas of coordination, surveillance and response, clinical management, vector control and risk communication led by the Ministry of Health together with development partners and several supporting agencies.

Conclusions: The risk factors for death remain unclear. Further exploration at the community is needed to understand if health seeking behavior influences clinical outcome or whether there are other contributory factors.

Section 7: Vector borne diseases

P51. Factors influencing the circulation of malaria – Phu Quoc, Vietnam, 2011

Mai Anh Loi, Phu D. Tran and D. T. Le

Background: Phu Quoc Island is a malaria endemic area. Although malaria control measures on vector and larva control have been implemented by local health workers, the incidence of malaria has been increasing in recent years. We conducted a survey to identify the prevalence of indigenous malaria and factors influencing the circulation of malaria in Phu Quoc.

Methods: A cross-sectional study was conducted. Participants were randomly selected from a sampling frame. Blood smears were taken from 792 members of households and 396 participants were interviewed face-to-face using a standard questionnaire. Vectors and larvae were also investigated based on the guidelines of the World Health Organization and the Ministry of Health. Malaria control measures of the health system were reviewed.

Results: The prevalence of indigenous malaria cases was 2.4% (19). *An. tessellatus*, *An. letifer*, and *An. barbirostris* were found in this area. Knowledge on malaria control of participants was below 80%: 298 (75%), 301 (76%), and 270 (68%) participants had right knowledge on symptoms, vector, and mode of transmission, respectively. For health seeking behaviors, 316 (80%) intended to visit health facilities while 20% remain to buy medications from available local markets. Vector and larva control measures, health communication and active case detection activities did not reach proposed targets.

Conclusions: Indigenous malaria still existed in Phu Quoc while knowledge of local people was limited and malaria control measures were not implemented optimally. Direct health communication for local people should be enhanced to increase knowledge on malaria control. Furthermore, indoor residual spraying and use of insecticide-treated bed nets should be implemented in high risk populations.

Section 7: Vector borne diseases

P52. Implications of climate on dengue incidence in southern Viet Nam

Cuong Q. Hoang, V. Nguyen, Q. Luong, H. Tran, N. Ho, L. Phan, N. Tran and K. Thai

Background: Dengue is a major public health problem in Viet Nam. Dengue transmission dynamics is influenced by multiple factors including climate, urbanization, and population density. Climate is thought to be one of the key drivers of dengue transmission. However, its association and together with other drivers have not yet been thoroughly studied in Viet Nam. We aim to study primarily the influence of climate variables (i.e. temperature, rainfall and humidity) on dengue in 20 provinces in southern Viet Nam. In addition, the influence between population (i.e. population size and urban population) and environment (i.e. land use) characteristics combined with climate variable and dengue incidence were assessed.

Methods: We analyzed associations with monthly incidence data of dengue cases by employing multivariate meta- analysis assuming a non-linear relationship. In the first stage, we derived province-specific and average estimates across all provinces on the dengue incidence-temperature relationship. Estimates derived from the first stage were used in the multivariate meta-analytical model to quantify the heterogeneity and to assess its extent related to province-specific characteristics.

Results: The risk of dengue was higher in provinces and districts where the temperature was located at the first 5% temperature percentile. The risk of dengue increased 1.2 fold when the average monthly rainfall was above 178.5 mm and temperature was low. In contrast, the risk of dengue incidence increased by 1.2-1.4 fold when urban population and population size was low.

Conclusions: The application of this method for assessing associations with dengue incidence in time series is a promising tool to draw conclusions regarding its non-linear relationship that could lead to further studies to improve the understanding of between diseases and ecological factors.

Section 7: Vector borne diseases

P53. Risk Factors and Spatial Distribution of Malaria Incidence in Singkawang City, West Kalimantan, Indonesia, 2011

Agoes Yudi Purnomo, Tri Baskoro Tunggul Satoto and Lutfan Lazuardi

Background: Singkawang (geographical location 0°44'55.85"N and 108°516'47.6"-01°01'21.51"E) is one of the malaria-endemic areas in West Kalimantan. In 2010, the API was 2.07, above the Healthy Indonesia 2010 target of <1. People's livelihoods include rubber farming and mining, residents have a habit of being outside the home at night, high population mobility and stagnant water may be the cause of the high malaria incidence. This research looked at spatial distribution, spread prediction and risk factors of malaria incidence in Singkawang.

Methods: An observational case-control study was done and GIS used to determine the distribution and spread prediction of malaria incidence. Cases were malaria (+) patients at Singkawang from January to December 2011 recorded in registers of health centers and hospitals. Controls were malaria (-) patients recorded in the same registers. The total study sample was 282 consisting of 141 cases and 141 controls. Analyses were performed by chi square test and logistic regression with 95% significance level.

Results: Based on multivariable analysis the following were associated with malaria incidence: work (OR: 8.4), history of travel to endemic areas (OR: 3.8), use of insecticide-treated nets (OR:2.4), habit of activity outside home at night (OR: 2.5), and presence of stagnant water (OR: 3.2). Based on the stratified analysis, age and gender are confounding factors. Distribution of malaria (+) at Singkawang are clustered. Most likely cluster centered at Sagatani Subdistrict, and the secondary cluster centered at Pasiran Subdistrict. Malaria incidence at Singkawang buffering in a radius 1000 meters around the river.

Conclusions: Distribution of malaria incidence clustered in the mining area and the most densely populated, so malaria control program focused on the mining area and densely populated area with the main objective is the high mobility people like miners by implementing migration surveillance in collaboration with posmaldes at Singkawang.

Section 7: Vector borne diseases

P54. Risk factors for malaria incidence in Manimbaya Village, Balaesang Tanjung, Donggala Province of Central Sulawesi

Solikhin Dwi Ramtana, Satoto T.B and Pramono S.

Background: Donggala is an endemic area for malaria in Indonesia. In 2009, the API was 4.6 per 1000 population. On May 2010, a malaria outbreak occurred in Manimbaya village with AR 7.5% and CFR 1.3%. A study was designed to identify the precipitating risk factors for the outbreak with the aim to conduct appropriate prevention and control measures especially in remote areas.

Methods: We conducted a case-control study during December 2010 - May 2011. A case was defined as a person with clinical symptoms and had a positive smear for Plasmodium sp. A control was a person who had a negative smear for Plasmodium sp. Information about the distance from the breeding place, activity in the garden, use of mosquito repellent, house type (e.g. poor house/filmy) and availability of "plavon" was collected through observation and interviews of the study subjects. Odds ratios (OR) were calculated using multivariate methods.

Results: 133 cases and 133 controls were included in the study. In the case group, 74 lived at a distance less than 250 meters from the breeding places, 25 worked in the garden, 132 did not use any repellent, all houses were poor house/filmy and did not have "plavon". Multiple logistic regression analysis showed that distance from breeding place (OR = 2.221, 95% CI = 1.36 - 3.63) was significantly associated ($p = 0.001$) with malaria infections.

Conclusions: Living at a distance less than 250 meters from the breeding place was a risk factor for malaria. Eliminating the Anopheles breeding places around the settlement to prevent transmission of malaria infection is a priority in the malaria eradication program in Donggala.

Section 7: Vector borne diseases

P55. Screening for Malaria among residents of Bogangin and Watuagung Villages, Banyumas District, Central Java, Indonesia, 2012

Fitri Yani, D. Pramono and A. Pratiwi

Background: In 2011, there were 3,467 malaria cases in Central Java with a slide positivity rate of 4.8%. Malaria outbreaks are common in Banyumas District especially in endemic villages. Bogangin and Watuagung villages have the highest number of cases in the district. Mass screening of residents in endemic villages helps identify asymptomatic patients for early diagnosis and treatment. This study compares the use of a rapid diagnostic test (RDT) and microscopic examination of blood smears in detecting malaria cases in terms of sensitivity, specificity, positive and negative predictive values.

Methods: Mass screening was conducted among residents of Bogangin and Watuagung villages who consented to be tested for malaria. All subjects were asked about clinical symptoms and tested using RDT and blood smear microscopy. Blood smears were examined using standard microscopy done at the district health center. The results of testing at the district health center were considered the gold standard. Microscopy results of the health center and district laboratories were compared.

Results: We screened 195 residents, 6.15 % were found positive for malaria by RDT and/or microscopy. The sensitivities were 58% for RDT, 83% for clinical diagnosis using signs and symptoms only and 92% for microscopy. The kappa statistic for microscopy done at the health center and district laboratory was 0.95

Conclusions: RDT alone is not sufficient for diagnosing malaria although it can help in early diagnosis. Microscopy is still the preferred method for diagnosing malaria. Hence, steps should be taken to provide health centers with capacity to do microscopy with the district health office doing quality assurance.

Section 7: Vector borne diseases

P56. Survey on mosquito vector composition and seasonality of Japanese encephalitis virus in pigs in Cantho city

Huynh Ngoc Trang and Ho T. V. T.

Background: Japanese encephalitis is a viral disease that infects animals and humans. It is transmitted by mosquitoes. Pigs act as amplifier of the virus. An investigation on the species and density of Japanese encephalitis mosquito vectors and specific antibody against JEV in swine by Mac –ELISA test was done.

Methods: Swine sera at abattoirs and mosquito in around Cantho city were collected during year and one time per month.

Results: Total number of examined mosquitoes was 26,080, which belonged to five genera: Culex, Aedes, Anopheles, Mansonia, and Armigeres. The percentage of the Culex pseudovishnui was highest (83.05%) in all Culex subgenus. The highest density of the mosquitoes was found in July and another lower peak was observed in January. The number of mosquitoes in rainy season (14,988) was higher than that in dry season (11,082) but difference of mosquito densities of rainy and dry season was not significant ($p=0.73$). Mosquitoes in pig farms (23,818) were more abundant than in human dwellings (2,262) and there was statistically significant difference between mosquito densities of those places, $p=0.002$. In paddy cultivation, there was a positive correlation between density of mosquitoes and relative humidity, $R=0.97$, $Y=71.511x-5174.3$. Out of 704 sera, 32(4.5%) were positive by Mac- ELISA (recent infection). Highest infection rate was found in February (15%) and lower peak observed in August (10.9%). There was significant difference in recent infection rate of JE in pig between spring and autumn crop and this was correlated with density of mosquitoes, $R=0.9$, $Y=0.009x-0.47$.

Section 7: Vector borne diseases

P57. The Relationship between Socio-Cultural Factors and Malaria Prevalence in Tetel Village, Purbalingga Regency, Central Java, Indonesia

Fransisca Susilastuti, T. B. T. Satoto and C. Indriani

Background: Purbalingga is one of five districts in Central Java province that still have villages with a High Case Incidence (HCI) of malaria and had the highest Annual Parasite Incidence (API) (1.03 per 1000 population) in 2010. Tetel has been a village with HCI in Purbalingga since 2009 and had the highest API in 2011 (39.11 per 1000 population). The spread of malaria is affected by specific local factors, so this research was done to determine the individual and socio-cultural characteristics which have some relationship to the malaria prevalence.

Methods: This research is an observational research with a cross-sectional descriptive design. The subjects of research are 221 people aged > 15 years in the selected households. The research variables consisted of individual characteristics (age, sex, education) knowledge and behavior (night outing, the use of mosquito net, the use of repellent and the effort to find the healing). The data were analyzed by chi square tests and logistic regression.

Results: The prevalence of malaria was 7.7%. Plasmodium vivax (5.9%) and Plasmodium falciparum (94.1%) with the form of gametes (50%). The results of multivariable analysis showed that education (RP=0.34; 95% CI=0.13-0.89; p value= 0.029), the use of repellent (RP=2.97; 95% CI=1.02-8.67; p value=0.046), the effort to find the healing (RP=2.74; 95% CI=1.02-7.38; p value=0.046) were associated with malaria.

Conclusions: There has been a transmission of malaria with dominant Plasmodium falciparum and most of them are in the form of gametes. Education is a protective factor while the use of repellent and the effort to find the healing were the risk factors for malaria. We recommended that residents protect themselves from mosquito bites by using a repellent and seek medical consultation early when they develop fever. The early warning system of malaria could be improved by having patients actively seek treatment with minimal delay.

Section 7: Vector borne diseases

P58. Spatial distribution analysis of Scrub typhus in Korea, 2001-2011

Chaeshin Chu, H.S. Jin and D.Y. Han

Background: Scrub typhus is a vector transmitted infectious and febrile illness caused by *Orientia tsutsugamushi* bacteria. It is a militarily important disease which caused thousands of cases in the Far East during the Second World War. In Korea, more than thirty years after the Korean War, it re-emerged in 1985. Since then, it is now considered one of the most prevalent diseases in Korea. This study aims to analyze the spatial distribution of scrub typhus in Korea.

Methods: A spatial distribution of *Orientia tsutsugamushi* occurrence using a geographic information system (GIS) is presented and analyzed by spatial clustering and correlations. The data include address, incidence date, diagnosis date, age, job, gender, etc of all the patients in Korea from 2001 to 2011. To access the relationship between infectious and geospatial factors, the GIS database of 232 administrative boundaries and highways was used. We assessed the time-series trends of *Orientia tsutsugamushi* occurrence using histograms and first-order polynomial fitting. Each district has a minus (decreasing), plus (increasing), or irregular slope. First-order polynomial fitting was used for estimating the *Orientia tsutsugamushi* occurrence, and land category change. The district clustering was conducted using hierarchical clustering and region-growing segmentation.

Results: Two provinces showed a low incidence throughout the years. Some districts had a relation between scrub typhus incidence and *Orientia tsutsugamushi* occurrence. The land use change of districts did not affect the incidence rate.

Conclusions: GIS analysis shows the spatial characteristics of scrub typhus. This study can be used to construct a spatial-temporal model for scrub typhus incidence in Korea.

Section 8: Zoonoses

P59. An Outbreak of Acute Gastroenteritis among Commando Training Recruits, was it leptospirosis? - Selangor, Malaysia, November 2011

Harishah Talib, A. Rosemawati and K. Fadzilah

Background: Leptospirosis outbreaks among military recruits are common due to their continuous exposure to risky environments. On 27 November 2011, Banting District Hospital had been notified of gastrointestinal tract illness among commando recruits while in their field training courses. An investigation was initiated immediately to identify the causative agent, sources and risk factors for infection.

Methods: All trainees and trainers were interviewed using structured questionnaires. A confirmed case was defined as an individual who had history of vomiting or diarrhea with or without other symptoms and positive MAT (titer of 800) or PCR or ELISA tests (four fold rise in antibody titer). Univariate analysis was performed and risk factors were expressed in RR (95% confident interval, CI). Blood culture, stool and food samples were taken. Environmental examination and sampling were performed at different possible exposure sites.

Results: Out of 74 exposed trainees and trainers, 16 (21.6%) were confirmed with one death (CFR 6.3%). All of them were male trainees, Malays and median age was 21 years (range 19-32). Having had contact with water (RR 10, 95% CI: 2.42-41.38) and having open wound at upper or lower limb (RR 3.3, 95% CI: 0.99-10.97) were associated with leptospirosis but later was not significant. Infrequent hand washing increased the risk of infection (RR 15.4, 95% CI: 3.8-62.8). Taking prophylaxis showed no protective effect (RR 0.36, 95% CI: 0.10-1.28). Environmental samples from three different sites were positive.

Conclusions: Due to the very nature of their training environment, commando recruits are easily susceptible to leptospirosis infection. Nonspecific illness caused delay in diagnosis and led to death. Health education was given to trainees regarding regular hand hygiene and good wound care. Close supervision by health personnel on prophylaxis compliancy had already started.

Section 8: Zoonoses

P60. Asymptomatic Human Infections with Avian Influenza A (H5N1) Virus during 2006 and 2007 Outbreaks in South Korea

Donghyok Kwon, J.Y. Lee, J.H. Choi, N.J. Lee and C. Kang

Background: Following seven outbreaks in poultry farms (four chicken, two duck and one quail farms) in five cities in South Korea between November 2006 and March 2007, it was suggested to evaluate the potential for avian-to-human transmission of highly pathogenic avian influenza (HPAI) H5N1 viruses.

Methods: To evaluate the frequency of transmission from birds to humans and as a public health response, we conducted epidemiological and serological investigation on persons who worked on poultry farms or culled birds during the 2006/2007 outbreaks in South Korea. All sera were tested for antibodies to H5N1 virus by microneutralization tests and were considered to be positive if anti-H5 titers of ≥ 80 were obtained.

Results: During the 2006/2007 HPAI H5N1 outbreaks, sera from 114 H5N1 confirmed poultry farm workers or their household members were collected and 301 single serum samples were taken from bird cullers. Anti-H5 antibodies were detected in one poultry farm worker and two bird cullers. The median age of the participants was 39 years (range, 7 - 84 years), and 357 (86%) were male. We found one seropositive person who worked on a quail farm and her main work was to care for quail chicks at hatcheries and she had frequent contact with quails.

Conclusions: We found 3 (0.72%) seropositive cases among 415 H5N1 exposed persons. However, no one reported any influenza-like illness or fever. Therefore they all were considered to be asymptomatic infections. This is the first time to find seropositivity for H5N1 among poultry farm workers in South Korea and exposure to infected quails could be a risk factor for infection.

Section 8: Zoonoses

P61. Conduct of Dog Ecology Study and a Knowledge, Attitudes, Practices Survey on Rabies Control amongst selected communities

Nguyen Van Long, P. Q. Minh, N. N. Tien, N. T. K. Oanh, V. D. Ky, D. H. Dung, N. P. Oanh, N. T. Thuy, K. Shimizu and C. Benigno

Background: A cross-section study was carried in 12 communes of three districts (Cam Khe, Phu Ninh and Viet Tri) of Phu Tho province, Viet Nam from 29 October to November 2012 to (1) better understand dog ecology; (2) identify the gaps in the attitude, knowledge and practices, which may associate with dog ecology and rabies control activities; (3) identify the interaction between humans and dogs and other common animals; and (4) identify major constraints of the current control strategies so that can justify allocation of resources to better control rabies.

Methods: The study using multistage sampling strategy involved with 1,378 respondents. Face-to-face interviews using a pre-tested questionnaire were carried by trained staff of the Sub-department of Animal Health and District Veterinary Station of Phu Tho province. Descriptive analyses were carried to have summary statistics while univariate and multivariable logistic analyses were carried to quantify the effect of factors influencing the model outcomes such as probability of raising dogs, probability of dogs contacting other animals, probability of dogs being given rabies vaccination and probability of respondents having proper knowledge of rabies and prevention and control measures.

Results: Descriptive statistics showed that 100% interviewees replied to the questionnaire. A total of 1,200 household respondents comprised 53% males ($n = 631$) and 47% females ($n = 569$) or ratio of man / woman was 1.11/1. Respondents aged from 18 to 100 years and the most common ages were between 36 and 50 years old (36%), followed by those aged between 51 and 70 years (34%) and then less than 36 (21%). The odds of raising dogs for those respondents who live with their spouse and children was 4.96 (95% CI 2.87-8.57) times more likely compared with those who live alone. The odds of properly knowing about rabies of those non-dog raising households was 2.12 (95% CI 1.34-3.34) times more likely than those dog raising households.

Section 8: Zoonoses

P62. Distribution Patterns of Leptospirosis in Klaten District, Indonesia - 2011

Desy Ari Apsari, S. Budiharta and L. Lazuardi

Background: Indonesia is a country with high case fatality rate of leptospirosis reaching 7.1%. Klaten district is one of the districts with leptospirosis cases. Data in 2008 showed that 21 of 66 people under investigation were positively infected by leptospires. In 2010 there were five deaths among 15 cases found.

Methods: An ecological study among 105 residents was implemented in Klaten in 2011. Subjects were those diagnosed with leptospirosis or infected by *Leptospira*. Analysis of the data used the average nearest neighbor, Bernoulli purely spatial models, McNemar chi square test (95% CI) and conditional logistic regression (95% CI).

Results: Average nearest neighbor analysis showed that the index of nearest neighbor from the point the case was 0.7 (<1), the value of z score = -5.84, p-value 0.01, it means the pattern distribution of leptospirosis in Klaten are clustered. Buffer in the case showed that trend to cluster at a radius of 15-30 m from house to house. Results of multivariable analysis using logistic regression conditional test showed that the risk factors simultaneously associated with the incidence of leptospirosis in Klaten were sanitary housing is not good (OR = 7.89, 95% CI: 2.68 to 23.21, $p = 0.000$), occupational factors (OR = 3.77, 95% CI: 1.49 to 9.54, $p = 0.005$) and a rat in your neighborhood (OR = 3.58, 95% CI: 1.35 to 9.49, $p = 0.010$). The analysis showed that 47.28% incidence of leptospirosis in Klaten was influenced by the exposure to these three risk factors.

Conclusions: Characteristics of cluster region is close to the rice field area and densely populated residential houses with poor sanitation. We recommended that environmental sanitation be improved especially in areas with clustering of leptospirosis cases.

Section 8: Zoonoses

P63. A Resurgence of Leptospirosis after Monsoon Flooding in Davao Region, Southern Philippines 2013

Ma. Justina G. Zapanta, A De Guzman, PK Ching, VC Delos Reyes, MN Sucaldito, EA Tayag

Background: On February 7, 2013, the National Epidemiology Center received a report of increasing leptospirosis cases in Davao City after monsoon flooding. In 2011, there was leptospirosis outbreak after a flashflood in the same city. FETP team was sent to investigate the health event to determine existence of an outbreak and identify risk factors for prevention and control.

Methods: We conducted a case-control study. A suspect leptospirosis case was a previously well individual from Davao Region who had fever of 2 days or more with any of the following: myalgia, conjunctival suffusion, jaundice, anuria/oliguria, hematuria and calf pain from January 6-February 15, 2013. We reviewed medical records of admitted cases from hospitals. Blood samples were collected for Microscopic Agglutination Test (MAT) or Polymerase Chain Reaction (PCR) for leptospira.

Results: Sixty-four suspect cases and six deaths (CFR: 9%) were identified. Age ranged from 14 - 73 years (median: 33 years). Majority (86%) were males. Most (33%) affected age group belonged to 21-30 years old. Twenty-seven (64%) were positive for leptospira sp. Multivariate analysis result showed that cases who had contact with moist soil (OR= 15, 95% CI: 4-56 p-value=0.00) and with open wounds (OR= 5, 95% CI: 1-13; p-value=0.00) were the true risk factors. No prophylaxis was taken by those exposed to flooding.

Conclusion: There was a resurgence of leptospirosis in Davao region. Contact with moist soil and presence of open wounds sustained during wading in floodwater of exposed individuals without taking prophylaxis may have caused the disease occurrence. Investigation of the event, management and treatment of cases, health education and dissemination of IEC materials were conducted. Key Words: Leptospirosis, case-controls, risk factors, flooding, open wound

Section 8: Zoonoses

P64. Epidemiologic characteristics of human brucellosis in Hubei, China, 2013

Chen Xiao-hui, Zhang L. and Xing X.

Background: There had been no human brucellosis reported in Hubei before 2009. Since 2010, the number of human brucellosis cases has increased gradually. From January to July 2013, 22 human brucellosis patients (twice the average of the past three years) were reported in Hubei province. We conducted this study to identify the characteristics of reported human brucellosis in Hubei and to develop specific prevention and control measures.

Methods: We investigated all of the 22 human brucellosis cases. We interviewed each case by a questionnaire asking about demographics, exposure to herd and the process for diagnosis.

Results: The 22 cases occurred in 13 out of 118 counties in Hubei province. 50% of cases were in two adjacent prefectures. The median age was 45 years (range: 20-69). 17 cases were male and five were female. 82% of cases bred sheep, 5% were sheep wholesalers. 42% of cases went to village clinics first when they got sick, 32% to township hospitals, 16% to county hospitals and 11% to prefecture hospitals. 47% of cases were referred once, 26% twice and 11% thrice. The median interval from onset to diagnosis was 46 days (range: 13-91). 75% of cases were diagnosed by provincial hospital.

Conclusions: A high percentage of cases had exposure to sheep. The patients usually visited village or township clinics first when they became ill. Some patients had to be referred multiple times before being diagnosed. The diagnosis (and thus treatment) for brucellosis patients was often not timely. We recommend that the public health sector strengthen surveillance among farmers who raise sheep and increase proficiency for recognizing brucellosis by village and township clinicians.

Section 8: Zoonoses

P65. Highly Pathogenic Avian Influenza (subtype H5N1) monitoring in live bird markets—Vietnam, 2011-2013

Pham Thanh Long, L. Loth and S. Newman

Background: Highly Pathogenic Avian Influenza (HPAI) (subtype H5N1) is endemic in poultry in Vietnam. HPAI H5N1 events have significant impact on poultry production, farmers' livelihoods and human health. Since 2003, the disease has resulted in 125 human infections in Vietnam, with 62 fatalities. In early 2013, two people got infected, of which one died. Human infections occur through close contact with infected, virus shedding poultry. This study reports on the surveillance conducted in live bird markets (LBM) to evaluate the temporal and spatial extent of HPAI.

Methods: Initially, monthly surveillance was conducted in 268 LBM in 125 districts in 30 provinces and cities from September 2011 till March 2012. Since December 2012 ongoing monthly surveillance is conducted in 120 small LBM and 20 large LBM in 120 districts in 40 provinces and 20 cities. At each market, each month, diagnostic specimens were collected from 30 healthy ducks by oro-pharyngeal swabs. Five swabs were pooled and tested at the Regional Animal Health Offices for Influenza-A H5N1 by Real-time RT-PCR.

Results: Over the two surveillance periods, 6.3% (95% Confidence Interval: 5.8 – 6.8 %) of a total of 8,464 pooled samples tested positive for Influenza-A H5N1. During both periods, the virus was found every month and at least once in 36 out of 44 provinces.

Conclusions: HPAI H5N1 is likely continuously present in Vietnam in large parts of the country. Sub-clinical infected, virus shedding ducks in LBM cause a considerable public health risk. Preventive measures of human exposure to HPAI H5N1 should include personal protection of poultry workers and improved food safety and hygiene measures.

Section 8: Zoonoses

P66. Risk Factors for Hookworm-Related Cutaneous Larva Migrans and Prevalence of a Definitive Host in a Settlement Area--Kulon Progo District, Indonesia, 2012

Lutvi Heryantoro, Soeyoko and R.A. Ahmad

Background: Reports of cases of Hookworm-Related Cutaneous Larva Migrans (HrCLM) in Kulon Progo District have been increasing during 2009 to 2011. The prevalence of dogs and cats with ancylostomiasis was unknown. The aim of this research is to determine risk factors associated with HrCLM and prevalence of cats and dogs with ancylostomiasis.

Methods: We did a case-control study. Cases were patients diagnosed by medical doctors based on clinical manifestations. Controls were persons who visited a primary health care center but did not have HrCLM. Behavioral, environmental and socio-demographic factors were analyzed. Chi-square tests and logistic regression were done. Feces of dogs and cats were examined using the floating method.

Results: There were 80 case-patients with HrCLM and 80 controls included in the study. Always walking barefoot ($p < 0.0001$), sometimes walking barefoot ($p = 0.022$), contact with sand ($p < 0.0001$) and environment i.e. soil texture ($p < 0.0001$), constant presence of a cat ($p = 0.024$) and having dogs or cats infected with *Ancylostoma* sp. ($p < 0.0001$), and age ($p = 0.027$) were associated with HrCLM. Logistic regression analysis showed that the following were risk factors for HrCLM: contact with sand (OR=15.898; 95% CI: 5.258–47.176) and having dogs or cats infected with *Ancylostoma* sp. (OR=3.292; 95% CI: 1.260–8.210). We found that 42.9% of 187 cats and 52.5% of seven dogs were infected with *Ancylostoma* sp.

Conclusions: Behavior, environment and socio-demographic characteristics were risk factors for HrCLM in a settlement area in Kulon Progo District. There was a high prevalence of cats and dogs with ancylostomiasis in the settlement area.

Section 8: Zoonoses

P67. The occurrence of *Alaria alata* mesocercariae in pig carcasses in nine provinces bordering the Mekong River delta of southern Vietnam

Phan Thanh Thuy Duyen, L. Srikitjakarn, S. Tiwananthagorn and P. Paulsen

Background: *Alaria* spp. is considered potential zoonotic trematodes, because an intermediate stage of this parasite has been implicated in sporadic human cases. With *Alaria alata* (*A. alata*), the final hosts of the parasite are wild carnivores. The intermediate hosts are wetland or water-associated animals, such as snails, tadpoles and frogs. However, other vertebrates can serve as paratenic hosts during the mesocercarial stage of the parasite. This study is a first survey to investigate the occurrence of *A. alata* mesocercariae in fresh pork in nine provinces bordering the Mekong River delta region in southern Vietnam. In this area there are many river tributaries, and traditional pig farming methods have low bio-security measures. The samples were collected from pigs at slaughterhouses from December 2012 to May 2013.

Methods: Cheek and peritoneal muscle tissue samples were collected from 621 pig carcasses immediately after the slaughtering process. The samples were tested using the *Alaria* Migration Technique (AMT) developed by Riehn (2010).

Results: Of 621 samples tested, none were positive for *Alaria* spp. mesocercariae.

Conclusions: The prevalence of *Alaria alata* in slaughtered pigs in the nine provinces bordering Mekong River was less than 5% during this study. The results do not allow the conclusion that the delta is free from *Alaria* spp. without further surveillance and monitoring of appropriate target populations for the adult parasites and the intermediate stages. Further studies should be applied in wild carnivores, snails, amphibians, and humans, to determine occurrence in other species.

Section 9: Other topics

P68. Hand Foot and Mouth Disease Outbreak in a Remote Boarding School, Sarawak

Hasrina Hassan and A.Kiyu

Background: On the 30th March, 2012, a remote school in Sarikei, Sarawak was reported to have seven cases of Hand Foot Mouth Disease (HFMD). Investigation was initiated to verify, describe and identify risk factors of the outbreak. We aimed to control the outbreak and prevent spread to surrounding longhouses and also prevent recurrence of outbreak.

Methodology: Cases were identified through passive and active case finding among the school community and inhabitants of surrounding longhouses. Their presenting symptoms were described and throat swabs sent for viral culture. Environmental assessment was performed. Outbreak control measures included social distancing, disinfection of dorms/classrooms as well as health education on gatekeeping and hygiene practices. Offensive containment was carried out by applying the same control measures in the surrounding longhouses.

Results: There were 7 cases (Attack rate= 6.1%) in the school with an age range of 2-10 years. All (n=7) presented with mouth ulcers and maculo-papular rashes while 71% (n=5) had vesicles on palms and soles. All clinical samples were negative for causative agents of HFMD. Student's dormitories were crowded. There was no proper garbage disposal system at the school. A recent disruption in gravity feed water supply has led to limited use of water for cleansing and consumption.

Conclusion: Poor sanitation, disruption of water supply and overcrowding was suspected to contribute to the spread of illness. Following control measures and offensive containment, the outbreak stopped and did not spread to surrounding communities. The health department and local communities reconstructed the gravity feed piping system and built a garbage disposal system for the school. We recommend the Education Department to look into the overcrowding at school dormitories

Section 9: Other topics

P69. Anti-Bacterial Properties of *Centella asiatica* Leaves (extracts) to Reduce Infection by *Salmonella typhimurium*

Jontari Hutagalung, Estiana K. and Lilis S.

Background: Typhoid fever is a common illness in tropical area, especially among those with poor hygiene. In humans, it is mostly caused by *Salmonella typhi*, meanwhile in Balb/c mice, it is caused by *Salmonella typhimurium*. An in-vitro study showed that *Centella asiatica*, very abundant in Indonesia, has bacteriostatic and bactericidal effects towards *Salmonella typhi*. This study will provide new information on the effect of oral extract of *C. asiatica* leaves on the number of bacteria in blood of Balb/c mice infected with *S. typhimurium*.

Methods: We conducted an in vivo experiment with posttest-only with group design at microbiology lab, from May-June 2012 at Faculty of Medicine, UMY university. 21 Balb/c mice divided into 7 groups (controls [1 and 2], intervention extract 125 mg/kg-BW [3], 250 mg/kg-BW [4], 500 mg/kg-BW [5] vs 1.3 mg only chloramphenicol [6] vs combination 125 mg/kg-BW extract with 0.975 mg of chloramphenicol [7], each group n=3. Statistical analysis used Spearman rank-test and number of bacteria in blood obtained streak plate count method (McConkey media).

Results: This study found the lowest average number of bacteria in blood was 3.3 ± 58 in the combination group [7]. The highest bacteria count in blood was 34244 ± 59022 (found in the control group [1]. Unfortunately no significant effect of all *C. asiatica* extract doses towards the number of bacteria in blood reduce ($p > 0.05$) but at doses combination 125 mg/kg-BW extract with 0.975 mg of chloramphenicol was strongly associated with number of bacteria reduce ($p < 0.05$).

Conclusions: Combination of *C. asiatica* extract and chloramphenicol was strongly significant to reduce the number of bacteria in blood of Balb/c mice infected with *S. typhimurium*.

Section 9: Other topics

P70. Posture, Lifting and Carrying Weights Contributes to Musculoskeletal Disorders in Bulog Warehouse--Kupang, 2010

Jusly A. Lakapu, Ruliati L. and Marylin J.

Background: One of the key causes of musculoskeletal disorders is lifting and carrying heavy materials manually using the wrong posture. In the Bulog warehouse of Kupang, the main activity is the manual loading and unloading of rice sacks. This study assessed the relationship between posture whilst lifting and weight with subjective reports of musculoskeletal disorders among laborers working at the warehouse.

Methods: An analytical survey with a cross sectional design was conducted. The respondents were 43 laborers in the warehouse. Variables observed were posture whilst weight lifting and the weight lifted. The dependent variable was report of musculoskeletal disorders by the laborers. Data were collected using a questionnaire and observation of each laborer's lifting technique. Chi-square test was used to assess the relationship between posture and weight with musculoskeletal disorders.

Results: Only two (4.7%) laborers used the correct posture technique whilst lifting. For weight lifted, one (2.3%) laborer reported never exceeding the standard maximum weight of 50 kilograms (kg). Most (n=41, 95.6%) laborers reported musculoskeletal disorders. They carried 60 kg rice sacks routinely for four hours each day. There was a significant relationship between posture ($p=0.01$) with musculoskeletal disorders, and lifting weight ($p=0.047$) with musculoskeletal disorders.

Conclusions: We advised managers at the warehouse to provide laborers with trolleys or strollers to decrease the strain on the body whilst carrying and lifting heavy loads. Laborers should also be trained in the correct method for lifting to avoid repetitive or monotonous movements that cause injuries.

Section 9: Other topics

P71. Situation assessment using the safety equipment, equipment containing mercury compounds at General Hospital of Nam Dinh Province, Viet Nam, 2013

Nguyen Thi Lien Huong, T. Dang and T. Bui

Background: For mercury waste management and encouraging the use of mercury devices in medical facilities in Vietnam, we initially evaluated the use of mercury and mercury compounds, to orient towards the replacement of equipment that do not contain mercury at General Hospital of Nam Dinh province in 2013.

Methods: We conducted a cross-sectional hospital-based study about mercury on knowledge, practice, and use of equipment, chemical waste management and ability to replace devices that contain mercury by interviewing 135 staff, including hospital leaders and staff of 20 departments in June 2013.

Results: All departments used equipment containing mercury but medical staff had not been trained on this. Only some health workers had guidelines on management of mercury poisoning (15%), for some the replacement of devices that contain mercury was not needed (18%), for some the harmful effects of acute (49%) and chronic (39%) mercury poisoning were unknown. Some people don't notice the safety when using equipment, materials containing mercury (8.9%). Once a device or equipment containing mercury is broken: more than a half opening ventilation (60.7%) and clearing mercury debris (77.7%), but only some collect mercury (20%) or directly dispose of mercury down the drain (1.8%); 34% of people don't know how to handle mercury waste and 40% don't know about first aid for mercury poisoning.

Conclusions: Most departments use materials and equipment containing mercury. The number of equipment containing mercury breaking yearly is high but the hospital didn't have tools and medical staff weren't trained to manage mercury waste. The proportion of medical staff who know about safe mercury use is very low, initial management in case of mercury poisoning is poor. This is a matter of concern and needs to be intervened in the future.

Section 9: Other topics

P72. Differentiation of Etiology of Acute Meningitis and Encephalitis based on Symptoms, Signs and Biochemistry Tests--Guigang city, Guangxi, China, 2007- 2009

Yihong Xie, V. Chongsuvivatwong, X.H. Wu, Y. Tan, C. Jiraphongsa, V. Sornsrivichai, J.Y. Yang, M. Lin and F.Y. Bi

Background: The true incidence of acute meningitis and encephalitis (AME) was unknown. It is difficult to discriminate viral encephalitis (VE) and bacterial meningitis (BM) based only on symptoms and signs. We conducted a study to estimate the incidence rate of AME and detect factors that could assist in clinical diagnosis.

Methods: We established a hospital-based AME syndrome surveillance system in 12 county level hospitals of Guigang, which covered a population of 4.2 million. We defined an AME syndrome case as any patient with acute onset of fever and two of the following: headache, vomiting, meningeal signs, and change in mental status. We interviewed patients using a structured questionnaire and collected serum and /or cerebrospinal fluid (CSF) specimens. We used culture or RT-PCR for bacteria, and enzyme-linked immunosorbent assay to test ten viruses.

Results: We found 1,396 AME cases from May 2007 to December 2009. The annual incidence rate was 12 per 100,000 populations. 58% of AME were due to viral (IgM positive) pathogens and 4% were positive for bacterial pathogens. Accuracy of discharge diagnosis of AME compared to laboratory results was 58%. Compared to those with negative laboratory results, both VE (OR=1.6, 95% CI=1.1-2.0) and BM (OR=1.5, 95% CI=1.02-2.1) had increased leukocytosis, but CSF protein and leukocyte count only increased in BM (OR=1.3, 95% CI=1.1-1.6) and decreased in VE (OR=0.8, 95% CI= 0.7-0.9). Using binomial logistic regression, VE had decreased CSF protein and leukocyte count and occurred at younger age compared to BM. However alteration of consciousness and meningeal irritation were more common in BM.

Conclusions: Annual incidence of AME was high while accuracy of clinical diagnosis was low. We recommend that CSF protein, leukocyte count, age, alteration of consciousness and meningeal irritation be used in diagnosing bacterial or viral central nervous system infection.

Section 9: Other topics

P73. Association of Knowledge and Attitude with Long Lasting Insecticide-impregnated Net Usage by Adults--Hargotirto, Indonesia, 2012

Muammar Muslih, N. M. Kibtiyah and B. Rahayujati

Background: Previous investigations show that use of long lasting insecticide-impregnated Nets (LLIN) is influenced by knowledge and attitude. This study was done to describe the association between knowledge and attitude with LLIN usage behavior in persons >15 years in Hargotirto, Indonesia in 2012.

Methods: This was a cross sectional study. The sample was from the population >15 years selected randomly from cluster systems. Univariate, bivariate and multivariate analyses with logistic regression were done.

Results: There were 292 subjects. Of these, 95.1% had good knowledge, 77.8% had less attitude, and 80.8% used LLIN. Those who used LLIN with good knowledge and less attitude was 56.4%. Results of the bivariate analysis were: knowledge (OR =1.95 p-value =0.28, 95% CI=0.58-6.6), attitude (OR=18.47 p-value=0.000, 95% CI= 2.49-136.79). After logistic regression, attitude was associated with behavior after controlling for knowledge and education (OR=18.017, p-value=0.005, 95% CI=2.428-136.714).

Conclusions: There is no association between knowledge and the behavior of using LLIN. There is a significant association between attitudes to the behavior of using LLIN. We suggested that a public figure use LLIN project a positive attitude and motivate people to use LLIN. Holding of social gatherings for those who do not have LLIN for bed nets could also be done.

Section 9: Other topics

P74. Public Satisfaction Survey of Health Services in Health Centers in Kulon Progo Regency, Yogyakarta Province, Indonesia, 2013

Sugiarto, Haryatno B., Rimawati H. and Rochimah S.

Background: There are rumors that government services are sluggish and not of good quality. In order to improve the quality of service, it is necessary to identify the level of community satisfaction and the factors that influence it. The aims of this survey are to determine the level of public satisfaction and conduct an analysis of the elements that have a low level of satisfaction.

Methods: A cross-sectional survey involving 21 health centers with 3,150 respondents during March to May 2013, taken randomly with 10 visitors per day, was conducted. Instruments used assessed 14 elements. Determination of factors related to low level of satisfaction were documented.

Results: Total public satisfaction index was between 74.8 to 81.4. Category public satisfaction index at 20 (95.2%) health center (HC) are good and one HC with excellent category. The HC with excellent rating have implemented the ISO Quality Management System and Management Pattern Public Service Agency (Badan layanan Umum = BLU). However, not all elements provided satisfactory value. The elements that have the lowest index value are the time of service (43% HC), schedule of services (33% HC). Provider workload analysis results showed that in several areas the workloads of doctors are very heavy (one doctor for more than 50 patients/day). This situation is related to the government's policy on the moratorium on hiring of public servants and local government policy not to recruit temporary employees.

Conclusions: Increasing community satisfaction index can be done by improving the timeliness of service. When applying BLU addition of doctors can do recruitment in outsourcing.

Section 9: Other topics

P75. Factors associated with birth asphyxia among newborns of mothers-- Poonamallee District, Tamil Nadu, India, 2013: Hospital based case-control study

Sree Kalpana, P. Manickam, S. Srinivasan, K. Kumutha, S. Sriram, Vidya Ramachandran and P. Kamaraj

Background: From 2005 to 2012, birth asphyxia was the leading cause of infant deaths in Poonamallee district of Tamil Nadu, India. Studies on birth asphyxia mostly used APGAR scores which lack sensitivity. We conducted a hospital-based case-control study to determine factors associated with birth asphyxia.

Methods: On the basis of ICD 10, we defined a case as a mother of a baby with birth asphyxia defined as a baby who did not cry at birth or cried after resuscitation or after stimulation and/or did not suck breast milk. The sample size required 144 subjects with equal numbers of cases and controls based on the following assumptions: incomplete antenatal care (ANC) was 40%, odds ratio (OR) of 2 and 80% power. We collected socio-demographic, antenatal and intrapartum history through interview of mothers and review of medical records. We computed adjusted ORs (AOR), their 95% CIs and population attributable fractions (PAF) for identified factors.

Results: We recruited 70 cases and 70 controls (power=45%). Among the cases, 56% were below median age of 24 years, 30% had below 8th grade education, 40% had monthly family income below 6000 Indian rupees and 47% were primigravidas. Despite low power, we could identify that cases were more likely to have had incomplete ANC [AOR: 3.7; 95% CI: 1.2-11.5; PAF: 11%], facial or pedal edema during labor [AOR: 14.3; 95% CI :2.4-84.6; PAR: 23%], labor pain beyond eight hours [AOR: 8.1; 95%: 2.6-25.4; PAR: 47%], strained beyond five minutes before delivery [AOR; 4.5; 95% CI: 1.5-13.1; PAR: 30%] and amniotomy [AOR: 3.7; 95% CI: 1.1-12.1; PAR: 7%].

Conclusions: Incomplete ANC, prolonged labor pain, prolonged straining, presence of edema and amniotomy were risk factors for birth asphyxia. We recommended creating awareness about completing ANC and educating health workers to discourage prolonged straining and discontinue amniotomy.

Section 9: Other topics

P76. The Relationship of Self-care with Disability due to Leprosy in 10 Districts in Bogor Regency in 2012

Leny None None

Background: Indonesia is ranked 3rd in the world as a contributor to the new leprosy patients with disabilities level-2 (10.11%). Bogor district has even exceeded the national rate (15.18%). This study aims to determine the relationship of self-care with a disability in leprosy patients in Bogor Regency in 2012 after controlling for other factors.

Methods: A case-control study was done. The study population consisted of patients ≥ 15 years old with multi bacillary leprosy who had undergone at least eight months of treatment and recorded in the register of health centers in 10 districts in Bogor Regency in 2012. Cases were leprosy patients with level-1 or level-2 disabilities while controls were leprosy patients without disabilities. Subjects were selected using purposive sampling. There were 86 subjects consisting of 43 cases and 43 controls. Data were analyzed by doing bivariate and multivariate analyses.

Results: There is a variable interaction between self-care with a long illness factor. Multivariate analysis showed that leprosy patients who perform self-care and well long illness < 2 years obtained OR = 0.68 (95% CI: 0.12 - 3.72). There is a greater risk of disability in leprosy patients with poor self-care and pain ≥ 2 years with OR = 10.6 (95% CI: 1.03 - 109.86).

Conclusions: That self-care does not stand alone in influencing disability lepers but no interaction with the factor of self-care with a long illness. Long illness variable is a modifier that affects the relationship between self-care with a disability in leprosy patients in 10 districts in Bogor in 2012.

Social Programs

Welcome Banquet

The 7th TEPHINET Biregional conference will hold a welcome Banquet on 12 November from 19:00 onwards with the following program:

19:00 Meet and greet at the Lotus Ballroom of the Pullman Beach Resort.

19:30 Opening speech of TEPHINET conference organizer and the representative of the host country.

19:40 Toast and Party

20:00 Vietnamese traditional music and dance performance:

1. Little Drums – a folk song by Artists
2. Have tea and take some betel – Folk song
3. Spring comes to villages – Flute solo
4. The Vietnamese girls – Group dance in traditional dress “Ao Dai”
5. Still charming – Folk song
6. The National Melody – Monocord “Dan Bau”
7. Spring tour – Music Band
8. Da Nang, my homeland - Singers
9. The charm of Champa Kingdom – Apsara group dance
10. When the spring comes – Krongput solo.
11. Music and Culture exchange
12. The flower of the Sea – Group dance.

21:00 Music and culture exchange

21:15 End of welcome banquet



International Night

The international night will be held on **November 13th** from 19:00 onwards.

After 2 days of intense scientific and technical discussions, this is the time to relax and to consider the lighter side and talents of the field epidemiologists. The “entertainment” will be provided by the country FETPs.

So please also prepare your team for the International Night party!



City Tour

Discover Marble Mountain and Hoi An ancient town

Date: 14th November from 10:30am to 17:00pm

This trip is specially designed for all participants of the 7th TEPHINET bioregional conference 2013

10h15: Pick up at the lobby of Pullman Beach Resort.

10h30: Depart to visit the Marble Mountain Ngu Hanh Son)

10h45: Arrival at the Marble mountain village – Climb **Thuy Son** (Water) by the stone stairs and enjoy the panoramic view of the nearby countryside, and visit Huyen Khong cave before entering **Tam Thai and Linh Ung pagodas** (participants can take the lift if climbing is not a hobby). Rest at the foot of the mountain, where you can visit **Non Nuoc stone carving village**, where the local skillful sculptors create many marble products which are exported to many countries worldwide.

12h00: Transfer to the Cua Dai beach to have lunch at the local restaurant with great fresh seafood.

13h00: End of lunch. Depart to Hoi An ancient town – the highlight of the tour program

13h00: Visit the silkworm and handicraft workshop where Hoi An traditional handmade productions are skillfully performed

14h00: Take a walking tour around Hoi An Old Town to see the well-preserved sections such as: Japanese Bridge, Chinese Assembly Hall, Historical and Cultural Museum, etc.

15h30: Shopping at your leisure.

16h30: Pick up and transfer back to Pullman Beach Resort for rewarding and closing ceremony of the 7th TEPHINET bioregional conference.

17h00: Arrive at the resort. End of the trip.

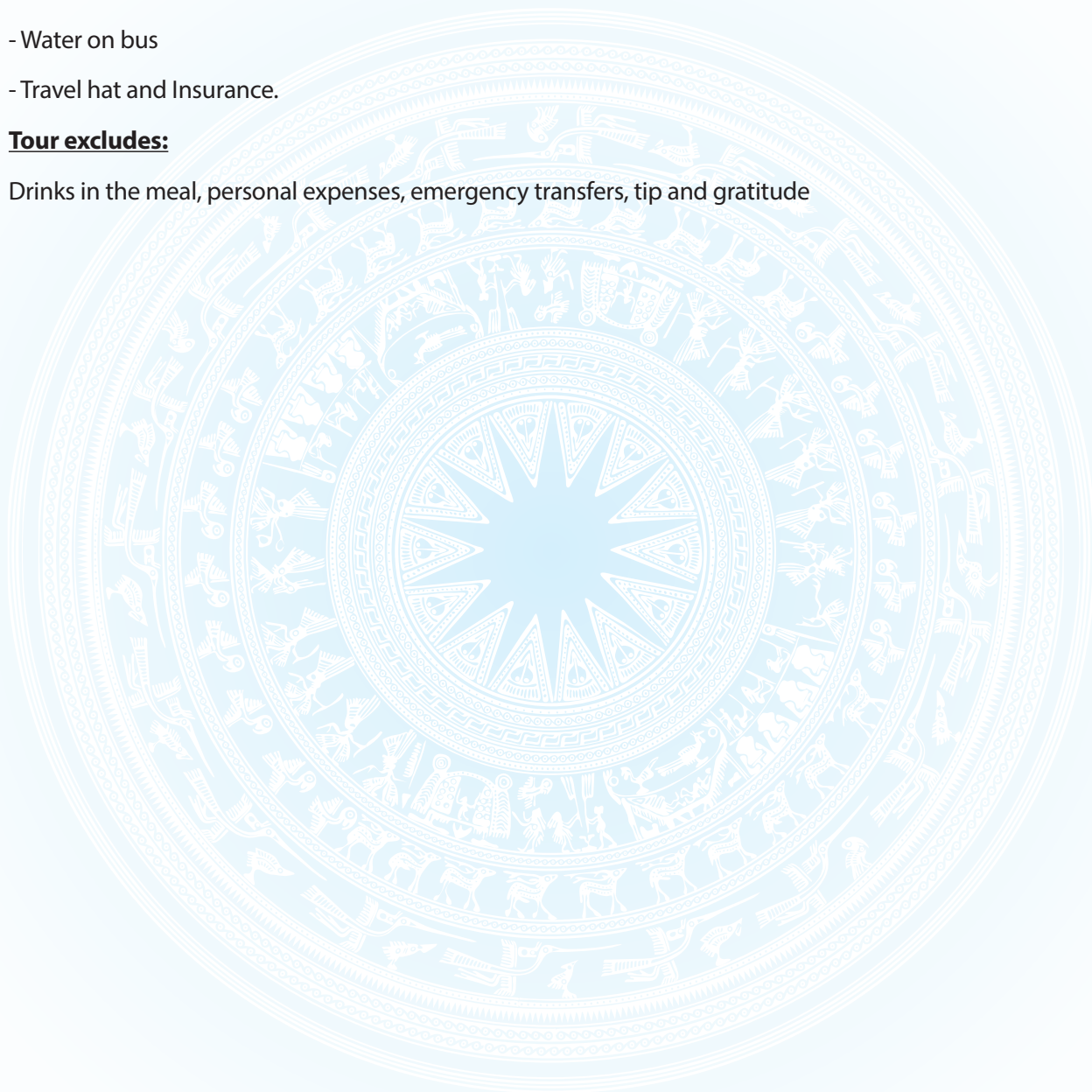


Tour includes:

- Full transportation as tour program indicated.
- Lunch at the local restaurant
- English- speaking guide
- Entrance fees.
- Water on bus
- Travel hat and Insurance.

Tour excludes:

Drinks in the meal, personal expenses, emergency transfers, tip and gratitude





Outside Guidelines

General Information for Presenters

- All conference presentations will be audio and video recorded and streamed-live on: www.tephinet.org
- Conference sessions will also be archived and recorded to watch at a later time.
- To opt out, please send an email to secretariat@tephinet.org:
Subject: *Video Recording Opt out*

Please include your *full name, country and title* of your presentation!

Oral Presentation Guidelines

A well-done, 10-minute presentation of a scientific paper is a summary of a study that includes only the data that support your main findings and the conclusions of these findings!

Tips on preparing your written presentation:

- You will be communicating the key findings and importance of your study to a diverse audience, so focus on presenting your message clearly, rather than on impressing them with the complexity and enormity of your investigation!
- Prepare a written script of your talk: A 10-minute oral presentation can be given from approximately 5 typewritten, double-spaced pages!

Use clear, plain, direct language and explain epidemiologic associations clearly:

- Always present the case definitions used
- Use sentences that describe the people studied, rather the risk factor in question.
- For example: “Persons who ate turkey were x times more likely to become ill than those who did not ($p < 0.05$)” is clearer and more direct than the sentence “Illness was significantly associated with eating turkey ($p < 0.05$).”
- Since most epidemiological studies are observational studies (not clinical trials), it is appropriate to express findings in terms of proportions (percentages of cases and controls with a given factor) and the likelihood that the observed findings occurred by chance (i.e. p-value).
- When presenting cohort data, use rates and relative risks with confidence intervals.
- When presenting case-control data, use odds ratios and confidence intervals.
- Use incidence vs. prevalence correctly.
- Orient the audience to each slide that has a figure. Do this by explaining to the audience what is represented by the x-axis, y-axis, and each series in the figure. For example: “This slide shows the incidence of X over the past ten years; incidence among blacks is indicated by the yellow line and incidence among whites by the white line.”
- Do not project a slide with figure on the screen and comment, without looking up and using a pointer, “As shown in this slide ...” The audience may only see a lot of numbers and not the pattern or trend in the data.

Advices for Delivering Oral Presentations:

Rehearse!

Practice! Practice! Practice!

Do not begin your presentation at the Conference until you are ready.

Speak slowly and project your voice.

Look out at your audience.

Check that the correct slide is projecting.

Remove each slide when you're done with it.

Use the pointer correctly.

Make the most of the Question-and-Answer period - here are some pointers:

- Take the time to make sure you *understand the question*. It is very common and normal that a presenter finds it hard to understand or remember the question posed, especially if questioner asks a long question or series of questions. *Feel free to ask* the questioner for clarification or to repeat the question.
- Pause for a while to think out your answer. Take a deep breath and gather your thoughts. What may seem like a panic stricken eternity to you will merely seem like a thoughtful pause to your audience.
- *Keep in mind that you know more about your own investigation than does the audience!*
- *Give short, direct answers.*
- Sometimes you can anticipate some questions and rehearse answers ahead of time.
- Consider all questions to be queries for information and treat them that way even if they may sound hostile to you. Avoid projecting a defensive attitude.
- Don't feel that you have to give an answer when you can't or there isn't one. If you are well prepared and confident, you can answer "I don't know" comfortably.

Poster Presentation Guidelines

A poster comprises one or more panels of text, tables, graphics, photographs, and other visual aids, which deals with a defined topic with a minimum of language and a maximum of visual information.

Important Information for Poster Presenters:

- Poster size is 36 (91.44 cm) x 48 inches (121.92 cm), vertical orientation.
- The Venue is *Pullman Beach Resort*, Da Nang City, Vietnam.
Display stands will be erected in this area.

A help desk will provide you with further instructions on how to set up your poster.

- **Please drop off your poster at the help desk on November 11, 2013 from 8.30-17.00 pm!**
- Posters for the conference will be put up from November 12 to 14, 2013.
- **We expect the poster presenters to stand by their posters every tea break (morning and afternoon) on November 12 to November 13!**
- It is optional for you to stand by your posters during lunch break.

Information about Da Nang, Viet Nam

Located on the Eastern coast of the Central region of Viet Nam, Da Nang (Đà Nẵng) ranks the third largest city in the country and the biggest city of the region. The city itself neither has the climate of Ha Noi nor the hustle-bustle of Ho Chi Minh City, but has its own sights and is close to the charms of Hoi An ancient town and the imperial capital of Hue. This makes Da Nang a popular vacationing spot for those who are eager to explore the attractions from the central part of Viet Nam or to soak up some rays while hanging out on the city's beaches.

The surrounding region of Da Nang was founded by the Cham practicing Hindus most possibly 3,000 years ago of which "My Son" sanctuary - the most grandiose vestige in Viet Nam and an UNESCO recognized cultural heritage - served as the capital city and centre of the Hindu Champa Dynasty. Vietnamese invasion into the region in the 17th century significantly halted Cham development and during the War, vast monuments and buildings were bombed. Given that Da Nang was the first point of colonial invasion, many vestiges of French architecture are present in the historic buildings. The city has grown rapidly in recent years, and has a 2008 population estimated at 900,000. Until recently, this growth was mostly outward and infill, but now there are high-rise buildings going up. There are, however, still many remnants of the "American War" in Da Nang. Each bridge is recorded with a different constructor, whether French, American, or Vietnamese. On the way to the popular tourist spot of China Beach, the ruins of a military base remain in the form of helicopter hangars. These can however be more easily spotted at the airport, which serves both civil and military flights.

The city is often overlooked by tourists but is one of the friendliest destinations to backpackers visiting Viet Nam. "My Khe Beach", also known as China Beach for American soldiers, is now home to a small community of guest house owners, marble statue shops, and other various trades. Some of the most beautiful and isolated beaches in Viet Nam are found here, among the most humble and friendly people. This is a must stop for budget travelers.

Until the early 90s, Da Nang was somewhat perceived as a hostile place to tourists, mostly a consequence of the old attitudes possessed by the provincial government. This, however, has changed and since the late 90s the provincial government, which actually became an autonomous city, has been enthusiastically



pursuing foreign investments and developing infrastructure. Da Nang has also some of the best roads in the country, i.e. the four-lane coast road connects northern provincial boundary with southern provincial boundary. Compared to either Ha Noi or Ho Chi Minh City, traffic in Da Nang is always less heavy although huge trucks blare along every now and then and there are rush-hours but often brief. Development is visible and rapid; the city has expanded tremendously over the past ten years. Numerous multi-storey buildings as well as beach resorts are under construction; and at least three large supermarkets and a Metro wholesaler are being completed. This also involves re-development of areas near the city beaches across the Han river, with whole blocks of old housing being razed and new roads being installed and luxurious villas constructed.

The downside to the very laid back, less serious and frenetic aspect of Da Nang is that locals frequently complain that there is nothing to do except drink, which they do a lot. This is not really true - there is a zoo, a soccer stadium, many tennis courts and pool halls, several large modern discos/night clubs and of course the beaches and Son Tra peninsula. However, it is also true that coffee and beer drinking are the most common leisure activities of most local residents.

The hottest months of the year are June, July and August, when the temperature can go up to as high as 40 degrees Celsius, and it is generally dry. There are usually tropical storms in October and November.

Dates

7th TEPHINET Bi-regional Scientific Conference will be held on 12-14 November 2013 in Da Nang City, Viet Nam

Accommodation

- 1) Pullman Beach Resort Danang 5*, Truong Sa Street, My Khe Beach, Ngu Hanh Son District, Da Nang City, Viet Nam
- 2) Gold Coast Hotel, 3*, 27 Ho Xuan Huong Street, Da Nang City, Viet Nam
- 3) Fansipan Hotel, 3*, Truong Sa Street, My Khe Beach, Ngu Hanh Son District, Da Nang City, Viet Nam

Venue: Pullman Beach Resort Danang 5*

Located on the stunning white sands of Bac My An beach, the welcoming and modern Pullman Danang Beach Resort is an oasis of activities and facilities for a dynamic escape. The resort is perfect for family holiday or romantic beach getaway. It will also provide a tailor made service if you are looking for the place to organize next incentive or event. It is only 15 minutes away from the airport and city, and just a short drive from three international golf courses. Thus, the upscale Pullman Danang Beach Resort is an idyllic luxury getaway located on the stunning white sands of Bac My An beach!

Tel +84 (511) 395 8888 Fax +84 (511) 395 1898,

Website: <http://www.pullman-danang.com>

Pullman Beach Resort Danang 5* from Da Nang International Airport

From Da Nang International Airport, take the Airport Road to Duy Tan street, drive over Nguyen Van Troi bridge, then drive towards the end of Nguyen Van Thoai street. Make a right turn into Truong Sa street, continue to drive to the cross road Truong Sa and Ho Xuan Huong street and you will see the hotel entrance sign on the left side right.

Accessibility

1. Transportation

Venue and hotel will be in Da Nang City. There is an airport in Da Nang named Da Nang International Airport. International flights to Da Nang are from Seoul (South Korea), Hongkong, Singapore and Siem Reap (Cambodia).

The organizer will arrange the **free** airport pick – up and drop – off for all participants. Please kindly send detailed flight information to ops@hoabinhtourist.com or contact with conference secretariat at the registration desk in front of Lotus Ballroom to register for the service.

Upon arrival at the airport, participants are suggested to look around to find a sign of “TEPHINET” held by the staffs. Participants might need to wait for some other participants to share the transfer if the flights are almost at the same time.

For airport drop off, please be ready at the lobby of the Pullman beach resort with your luggage and passport at least 2.5 hours before for international flights and 2 hours before for domestic flights.

2. Reservation Procedure

Room reservation for the Workshop and the Conference will be done by the Executive Committee, you can send to ops@hoabinhtourist.com

3. Reservation Procedure

Room reservation for the Workshop and the Conference will be done by the Executive Committee, you can send to ops@hoabinhtourist.com

4. Registration

Registration form should be submitted to Dr. Maria Consorcia Lim-Quizon (Dr. Conky Quizon), SAFETYNET, email conkyquizon@gmail.com

5. Administration

Please be informed that as part of our administration requirements, we are requesting participants to fill in the forms of conference - Registration Form and Hotel Reservation Form.

All participants from program members in the two regions whose abstracts have been accepted by

TEPHINET will be invited to participate in the Conference.

6. Exhibition

Participants are encouraged to bring posters and/or printed presentations related to Conference for exhibition in the hotel for information and experience sharing.

7. Cultural Gathering

The Conference Organizing Committee will host an Welcome Banquet on the first night, an International Night on the second night and a Farewell Dinner on the last night. Live music/electone will be available thus participants are encouraged to prepare for performance.

8. Clothing

The recommended outfit of the Workshop and Conference is smart casual. For travel to mountain areas, a light sweater or jacket is recommended

9. Gratuities

Providing tips is not encouraged in hotels and restaurants if a 10% service charge is already included in a bill. Extra tips from satisfying customers are optional. At most hotels a service charge of 10% is added to the bills.

10. Secretariat

9.1. The Secretariat of the Organizing Committee is located in the hotel where the Conference is conducted.

9.2. Please contact the following persons for any inquiries or arrangements related to the Conference:

Email: conkyquizon@gmail.com

Phone: +639228137987

11. Weather

Da Nang City has a nice tropical climate. During the duration of the Conference, sunny days are most likely predicted with an average temperature of around 24-30oC, Humidity of 85-87%.

12. Other Information

11.1 Interesting Places

For further information, please visit the following Da Nang's Official Tourism Website:

www.danangtourism.gov.vn

11.2 Electricity

The electric current is 220 Volts AC (50 cycles) throughout the country. The electric plugs and

sockets are most probably designed for two-pin plugs. It is recommended that delegates bring their own adaptors to comply with the electric current and plugs.

11.3 Communication Facilities

International direct phone for Da Nang +84-511, internet facilities in the hotel is available. Free WiFi covers throughout Da Nang city.

11.4 Banking

Banks are opened on Monday through Friday from 08.00 – 17.00 hours. However, foreign currencies exchanges can be found in all major shopping areas and hotels. Many shops and restaurants also accept credit cards. One US Dollar (USD) is approximately 21 000 Vietnamese Dong (VND).

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