Global
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CONFERENCE | 2017
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The 3rd Researchers Conference of Emerging
Disease at Convergence of Animal, Human
and Environmental Health

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GHI - Thailand 2017 Conference Proceedings

The 3rd Researchers Conference of Emerging Disease at Convergence of Animal, Human and Environmental Health

The 3ʳᵈ Researchers Conference of Emerging Disease at Convergence of Animal, Human and Environmental Health

Welcome message

Asst. Prof. Dr. Khwanchai Kreausukon
Dean
Faculty of Veterinary Medicine
Chiang Mai University
Thailand

Welcome to Global Health Institute – Thailand 2017!

On behalf of Faculty of Veterinary Medicine, Chiang Mai University I would like to express my congratulatory to the sustainable success in the collaboration between two World Organization for Animal Health (OIE) centres of Veterinary Services Capacity Building which are the Center for Animal Health and Food Safety (CAHFS), University of Minnesota, USA and the Veterinary Public Health Centre for Asia Pacific (VPHCAP), Chiang Mai University, Thailand.

The Global Health Institute – Thailand is organized again by Veterinary Public Health Centre for Asia Pacific (VPHCAP) to continue the leadership training exploring in the context of 'One Health' and specialized short courses on key skills such as risk analysis and participatory epidemiology during 5-24 February 2017. The GHI research conference is conducted for sharing of the latest scientific knowledge on timely topics for example, emerging and re-emerging diseases, antimicrobial resistance, and food safety together with the additional partners from ILRI have jointly supported in this GHI conference during 10-11 February, 2017.

I hope that you will find the Global Health Institute – Thailand 2017 and your stay in Chiang Mai both valuable and enjoyable.

Warmly,

Khwanchai Kreausukon

Welcome message

Dr. Tongkorn Meeyam
Director
Veterinary Public Health Centre for Asia Pacific
Faculty of Veterinary Medicine
Chiang Mai University
Thailand

It is a great pleasure and an honor to extend to you a warm welcome to the Global Health Institute – Thailand 2017 that be held during 10-11 February 2017 at the Imperial Mae Ping Hotel, Chiang Mai, Thailand.

The academic conference on *"The 3rd Researchers Conference of Emerging Disease at Convergence of Animal, Human and Environmental Health"* is built by the success of two World Organization for Animal Health (OIE) Collaborating Centres for Veterinary Services Capacity Building: the Center for Animal Health and Food Safety (CAHFS), University of Minnesota, and the Veterinary Public Health Centre for Asia Pacific (VPHCAP), Chiang Mai University, International Livestock Research Institute (ILRI) and Excellence Centre for Veterinary Public Health. Bringing researchers, professional and young scientists from various institutions to exchange and share experiences between expert, government and private sectors, academic scientists, graduate and doctoral-level students including refresh and explore innovation in veterinary public health knowledge.

I am pleased to sincerely express gratitude to University of Minnesota, USA, Center for Animal Health and food Safety, International Livestock Research Institute (ILRI) and Excellence Centre for Veterinary Public Health, Chiang Mai University to support and enable collaboration which makes the GHI 2017 is productive and achievement.

I hope you will meet your expectation and take an extra time to enjoy the spectacular and unique beauty of Chiang Mai, Thailand.

With best wishes,

Tongkorn Meeyam

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Managing the prevention versus treatment paradox: the case for shared leadership

Will Hueston
*Adjunct Professor, Faculty of Veterinary Medicine, Chiang Mai University, Thailand and Emeritus Professor and Endowed Chair in Global Food Systems Leadership, University of Minne*sota

Summary

Do we launch mass vaccination campaigns or pay for more drugs and develop more sophisticated treatment regimens? Mass prevention campaigns may be scientifically arguable but treatment of diseased individuals is more compelling, galvanizes public and political support, and commands more resources. If medical scientists and public health professionals want to promote prevention more effectively, we must embrace new strategies for shared leadership that change the discussion and forge new coalitions to address emerging and re-emerging infectious diseases.

Dr. Will Hueston is an Adjunct Professor at the Faculty of Veterinary Medicine, Chiang Mai University, Thailand and Emeritus Professor and Endowed Chair in Global Food Systems Leadership at the University of Minnesota. Earlier in his career, he directed the policy staffs for Veterinary Services at the US Department of Agriculture, Animal and Plant Health Inspection Service.

Dr. Hueston has a long time interest in animal health policy and the human-animal and environmental interface.

Use of cattle movement data and epidemiological modeling to improve bovine tuberculosis risk-based surveillance

Scott Wells
Professor, College of Veterinary Medicine and the School of Public Health,
University of Minnesota

Summary

Bovine tuberculosis (bTB) is a chronic disease of cattle that causes substantial economic losses to farmers. Given the role of movements of infected animals in the between-farm transmission of bTB, targeting surveillance based on animal movement data may be an effective strategy for rapid detection and control of bTB. In this study, data from Uruguay, a country with low bTB prevalence and a comprehensive animal traceability program, was used to evaluate risk-based surveillance strategies using epidemiological modeling; and 3) adapt the bTB model to assess bTB spread and risk-based surveillance in the US. We first performed a case-control study to identify risk factors for bTB in dairy farms in Uruguay. We found that larger farms that were the recipients of a larger number of cattle movements were at high risk of bTB infection. In addition, bTB-positive farms were significantly more connected to one another than expected by chance. Next, we developed an integrated within- and between-herd transmission model, parameterized with real-world data from Uruguay, to simulate the spread of bTB. Using this model, we evaluated 10 risk-based surveillance strategies and identified one strategy in which annual testing effort could be reduced by 40% without resulting in larger outbreaks. Finally, using simulated animal movement data for Minnesota, we investigated hypothetical between-farm spread of bTB in the Midwest US. Our findings suggested that although the current slaughter surveillance works well in preventing bTB transmission in the average situation, it is less effective in the top 10% worst case scenario. In summary, our research has shown that movement-related factors are important risk factors for bTB transmission between farms. Insights about risk factors for bTB in Uruguay were used to evaluate risk-based surveillance using epidemiological modeling and are applicable to other low prevalence countries such as the US.

Dr. Scott Wells is the Director of the Center for Animal Health and Food Safety (CAHFS) at the University of Minnesota, a World Organisation for Animal Health Collaborating Center for Veterinary Services Capacity Building. He is a Professor in the Department of Veterinary Population Medicine at the University of Minnesota (UMN). Prior to joining the faculty at UMN, Dr. Wells was an epidemiology with the National Animal Health Monitoring System of the US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services.

Dr. Well's research interests include the study of infectious diseases in animals to inform government disease control programs.

Strengthening risk assessment for food safety management and policy engagement in Vietnam

Fred Unger
Veterinarian, International Livestock Research Institute, Hanoi, Vietnam

Summary

Food-borne disease is a major public health issue in developing/emerging countries including Vietnam. The contamination of popular foods can occur all along the food value chain. It is crucial to understand how and where food safety issues arise to mitigate and prevent food-borne diseases. Risk-based approach is a tool for managing food safety, however in Vietnam it is rarely applied and the capacity for application is still lacking. As a case study, we will present the training and research in risk assessment for pork along the pig value chain in Vietnam. A national taskforce for food safety risk assessment has been developed to strengthen the capacity of risk assessors and to engage work with policy makers in risk management. Risk assessment short courses and training curriculum were developed and implemented at universities to strengthen the risk assessment capacity. In parallel, risk assessment case studies were conducted to assess health risks related to high risk foods consumption such as pork mainly traded in traditional markets. Finally the challenge of risk communication will be presented. Vietnam has a modern food safety law but its implementation is challenged by capacity and funding. While exports are reasonable well managed domestic food often fails to meet those standards. Gaps between research community and policy engagement are present, opportunities to overcome these will be discussed.

Dr. Fred Unger is a Veterinary Epidemiologist by training and currently holds a senior scientist position at ILRI Hanoi. He completed his degrees from Humboldt University (DVM) and Free University Berlin, Germany (PhD). His working experiences includes Sub-Saharan Africa (for 10 years), South East Asia (almost 10 years), and Germany (more than 5 years). He provided technical support to the EcoHealth/OneHealth Resource Center at CMU from 2011 – 2014. He has special expertise in Public health, EcoHealth and One Health.

INVITED Presentations

Linkage of environmental factors and health using a tool: "popular epidemiology" and its applications

Phongtape Wiwatanadate

Professor, Department of Community Medicine, Faculty of Medicine, Chiang Mai University and Director of Center for Research and Training of Health Impact Assessment

Summary

The effects of environmental factors such as factories, waste dumping sites to community health usually are difficult to prove, need experts, and require expensive laboratory investigations. The author has developed a tool so-called popular epidemiology using a map to locate cluster of people with health problems around the environmental factors. The full details of steps of popular epidemiology have been explained, which are easy to understand, not too expensive, and applicable for laypersons. Finally, the applications of this tool to the case studies in Thailand have been illustrated. It is found that this tool helps enable community to relate environmental factors and health effects by themselves.

Dr. Phongtape Wiwatanadate is a medical doctor and currently a professor and director of Center for Research and Training of Health Impact Assessment at Chiang Mai University, Thailand. He completed his degrees from Mahidol University, Bangkok, Thailand (MD) and University of Pittsburgh, Pennsylvania, USA (PhD) in Environmental and Occupational Health. He used to be a director of community hospitals. His experiences include working in communities for community development in environmental health surveillance, empowerment, and capacity building. His research interests relate to environmental and occupational health as well as human health risk assessment.

Tuberculosis: a global health threat

Akeau Unahalekhaka
Professor, Faculty of Nursing, Chiang Mai University

Summary

Dr. Akeau Unahalekhaka is a professor at Faculty of Nursing, Chiang Mai University, Thailand. She completed her degrees from Mahidol University (BSc and Ms) in 1977 and 1985 and Prince of Songkla University, Songkla, Thailand (PhD) in Epidemiology in 2007. She got a diploma from the Thai Board of Nursing Care of Infectious Disease in 2011. Her experiences include working in Disease Control Office (1978-1992) and Division of Epidemiology, Ministry of Public Health Bangkok, Thailand (1991-1992) as well as involving in hundreds of trainings, conferences, and guest lectures. In 2013, she was a president of Nursing Association for Prevention and Control of Infections (NAPCI) of Thailand. Currently, she is a council member of the Asia Pacific Society of Infection Control (APSIC), a consultant and supervisor in infection prevention and control among hospitals in Thailand (Regional, general, community, private, university hospitals) and a consultant of Central Sterilizing Services Association of Thailand.

The use of EcoHealth approach to develop intervention for the rational use of antibiotics in livestock production in Thailand

Suwit Chotinun
Assistant Professor, Department of Food Animal Clinic, Faculty of Veterinary Medicine, Chiang Mai University

Summary

Over the past few decades, antimicrobial resistance has been increasingly recognized as an important global problem, affecting both animal and human health and imposing potentially large social and economic burdens. The main contributors to resistance include overuse of antimicrobials in humans and animals, poor hygiene and sanitation and inefficient prevention and control of infectious diseases. These problems can be found in almost all farming systems, particularly in livestock production systems which antimicrobials are extensively used. All uses of antimicrobial agents contribute to the emergence of antimicrobial resistance, especially the use of sub-therapeutic antimicrobials in livestock for reducing the spread of diseases, increasing feed efficiency and growth promoter. Most resistant bacteria originated from animals can be transmitted directly from animals to human or indirectly, e.g. through livestock animal, contaminated water or environment. Moreover, the use of antimicrobial can be disseminated resistant genes across a wide diversity of bacteria, mainly through horizontal gene transfer.

Until over the last 10 years, colistin has remained of the last-resource antimicrobial for treatment of severe infection caused by multidrug-resistant (MDR) gram-negative bacteria, although colistin resistance has emerged among these pathogens and has been on a gradual increase. Therefore, all parties involved need to play a role in the prevention, control and troubleshooting, in order to minimize the impact of irrational antimicrobial use and develop effective strategies to promote the appropriate use of antimicrobials and the control of antimicrobial resistance in humans and animals.

In livestock production systems, farm owners and managers are the key decision-makers regarding to the use of antimicrobials on their farms. Their knowledge, attitudes and practices (KAP) toward the potential risks is an important factor. Moreover, fundamental changes in the behavior of farmers towards the usage of antibiotics in farm animals can reduce veterinary antimicrobial drug usage as 70 percent. For that reason, modifying the KAP of farm owners is an important potential early strategy to help preserve the antimicrobial effectiveness in this era of growing resistance and to develop effective interventions that can reduce inappropriate high levels of use of antimicrobials by farmers. An understanding of the current KAP situation among farmers and the underlying reasons for that situation could potentially be used in policy making, in providing appropriate farm-specific advice, and in encouraging suitable antimicrobial use practices on farms, e.g., educating farmers on strategies to minimize antimicrobial resistance. The key to promoting the appropriate antimicrobial usage on farms are veterinarians, who as a good reputation among farmers, are ideally suited to act as a channel for informing farmers about antimicrobial resistance and the correct application of antimicrobials. Although, some farm owner aware of the rational use of antimicrobials, but they generally disregarded in the practice. Therefore, the most effective means of reducing antimicrobial usage on farms might be considered by efficient law enforcement for proper antimicrobial usage, or effective financial policy including, financial compensation, bonuses, and punishments.

The focusing on target group's education aimed at changing the irrational and indiscriminate use of antibiotics in order to delay curtails the development resistance to antibiotics. Furthermore, education of target groups alone may not necessarily improve the tendency misuse and abuse antimicrobial. In order to avoid antimicrobial misuse, the clear guidelines for antimicrobial use on the farm and implementation of restricted policy on antimicrobial prescription should be developed. These issues could be disseminated to policy makers and other stakeholders to provide them with evidence on which to base policies and regulations regarding appropriate use of antimicrobials on farms.

Dr. Suwit Chotinun is an assistant professor at Chiang Mai University, Thailand. He completed his degrees (DVM in 2002, Ms in 2007 and PhD in 2014) from Chiang Mai University. His field specialization includes poultry preventive medicine, poultry production medicine, EcoHealth and One Health. His research interests also include epidemiology and molecular epidemiology. Currently, he is a lecturer of Faculty of Veterinary Medicine, Chiang Mai University.

ORAL Presentations

The use of loop-mediated isothermal amplification to detect *Mycobacterium tuberculosis* complex in milk: a survey on farms with history of bovine tuberculosis

Sukolrat Boonyayatra[1],*, Jarupat Kumcha[2], Sarawut Sai-Mo[2], Tawatchai Singhla[1]

[1] Department of Food Animal Clinic, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, Thailand
[2] Sixth year student, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, Thailand
* Corresponding author email: sukolrat.b@cmu.ac.th

Abstract

Bovine tuberculosis is a major zoonosis causing significant losses in animal production, threatening ecosystem and human health. Single intradermal test (SIT) is the standard diagnostic technique for bovine tuberculosis recommended by the OIE. However, applying SIT to a large number of dairy cattle is laborious and costly, and requires skills for both performing the test and interpreting the results. The use of a test to screen for suspected animals in order to reduce the number of animals tested for SIT can be useful. Loop-mediated isothermal amplification (LAMP) has been developed to detect various human and animal diseases including tuberculosis. Milk is a convenient sample for disease diagnosis in dairy cattle. We previously optimized a LAMP technique to be used with mycobacterial DNA extracted from milk samples. The detection limit of LAMP was 25 pg/μL. In the present study, we aimed to apply LAMP with milk samples to survey bovine tuberculosis in milking cows. Nine dairy farms with history of bovine tuberculosis based on results from annual SIT in 2011-2015 were selected. Individual milk samples were collected from all milking cows in each farm, which made a total number of 203 milk samples. DNA was extracted from each sample using a commercial DNA extraction kit as suggested in the previous study. LAMP amplifying a region in *esat6* gene of *Mycobacterium tuberculosis* complex was performed with DNA samples. LAMP products were visualized by gel electrophoresis. LAMP was performed twice on each DNA sample to confirm the observed positive reaction. The result showed that a total of 38 samples were positive for *Mycobacterium tuberculosis* complex using LAMP technique. Therefore, using LAMP performed in this study, a high prevalence (18.72%) of bovine tuberculosis was reported among milking cows in farms with history of bovine tuberculosis. Even though a further confirmation of the detection of *Mycobacterium tuberculosis* complex in milk samples should be performed, this study demonstrates a possible application of LAMP as a screening test for bovine tuberculosis in milking cows.

Keywords:

Loop-mediated isothermal amplification, *Mycobacterium tuberculosis* complex, milk, bovine tuberculosis

A social network analysis of goat movements in Nonthaburi province: implication on the spread of caprine brucellosis

Peerawat Chintrakulchai[1], Sirawit Vuttichai[1], Anuwat Wiratsudakul[2,*]

[1] Veterinary student, Faculty of Veterinary Science, Mahidol University, Salaya, Phuttamonthon, Nakhon Pathom, 73170 Thailand
[2] Department of Clinical Sciences and Public Health and the Monitoring and Surveillance Center for Zoonotic Diseases in Wildlife and Exotic Animals, Faculty of Veterinary Science, Mahidol University, Salaya, Phuttamonthon, Nakhon Pathom, 73170 Thailand
* Corresponding author email: anuwat.wir@mahidol.edu

Abstract

Caprine brucellosis is an important zoonotic disease caused by *Brucella melitensis*, the most virulent pathogen in the Brucellaceae family. The highest number of brucellosis outbreaks in goat in Thailand was notified from Nonthaburi province in 2014-2015. The present study therefore aimed to assess the risk of caprine brucellosis dissemination from and to each district in this province. A total of 104 farmers were interviewed to retrieve their goat movement behaviors throughout the year. A weighted-directed network was constructed based on destinations and frequency of goat movements. Degree, betweenness and closeness centralities were measured. In this network, the highest in- and out-weighted degree centralities were observed in Bangkok and Pak Kret at 264 and 150, respectively. The highest betweenness centrality was observed in Bang Bua Thong at 183 and the highest closeness centrality was found in Kanchanaburi at 0.0065. Our findings suggest that Bangkok was at the greatest risk to import goats infected with brucellosis from Nonthaburi province, meanwhile the disease may spread faster when Kanchanaburi gets involved. Within Nonthaburi, Pak Kret and Bang Bua Thong districts should be closely monitored for the caprine brucellosis importation. Our study may help relevant authorities to prioritize the areas for implementing measures to prevent and control of caprine brucellosis.

Keywords:

Animal movement, caprine brucellosis, epidemiology, social network, zoonosis

A Fuzzy Delphi analysis for pesticide applicators of Vector-borne Disease Control Unit, Ministry of Health, Malaysia

Sujith Kumar Manakandan[1],*, Rosnah Ismail[1], Mohd Hasni Jaafar[1], Priya Ragunath[2]

[1] Department of Community Health, UKM Medical Centre, Faculty of Medicine, Universiti Kebangsaan Malaysia, Malaysia
[2] Occupational Health Unit, Non-Communicable Disease, Ministry of Health, Malaysia
* Corresponding author email: sujithukm@yahoo.com

Abstract

In a tropical country like Malaysia, the spread of vector-borne infections such as dengue, malaria, filaria and the very recent Zika are very rampant and their incidence, especially dengue infections are increasing every year. One of the major activity by the Ministry of Health through its Vector-borne Disease Control is pesticide application to control the volume of the mosquitoes and it breeding ability. The pesticide applicators who are working relentlessly are under high risk for chemical and physical hazards due to that activity. A set of questionnaire is needed to assess their knowledge, attitude, practice, noise and chemical exposure risk among them. The most crucial step in forming a set of questionnaire is deciding the appropriate variables. The variables should be able to answer the study objectives clearly and precisely. Retaining an irrelevant variable and removing an important variable will certainly mislead the direction of a particular study. It is therefore very important to select the appropriate variables in a very objective and scientific manner. Fuzzy Delphi method is a scientific analysis technique which was used in this study among the pesticide applicators of Vector-borne Disease Control Unit of Ministry of Health in Malaysia. This involved sixteen experts comprising of eight public health physician from Occupational and Environmental Health Unit of Ministry of Health, three medical professors from occupational and safety health of both public and private universities, three health inspectors and two entomologists who are presently working in the Vector-borne Disease Control Unit of Ministry of Health. The main objective of this is to consolidate the consensus of these experts whether to retain or discard the variables in the questions. There were total of nine main variables with 83 sub-variables. Post Fuzzy Delphi analysis after considering the main three prerequisites, the experts have achieved consensus, whereby about 10% of the items were discarded. Later the questionnaire undergone cognitive debriefing among the actual pesticide applicators before it was finalized for pilot study. Applying Fuzzy Delphi method to obtain expert consensus is relatively alien especially in medical related researches. This method vanishes the ambiguity, diversity and inaccuracy of the opinions among the experts hence enhances the quality of the variables. This study can be beneficial as a guidance for any unbiased and independent medical or health related decision making.

Keywords:

Fuzzy Delphi, pesticide applicators, vector-borne disease control

Effectiveness of soursop leaf powder (*Annona muricata L.*) as ticks control in cattle of Brahman cross by in vivo

Amelia Ramadhani Anshar[1,2,*], Muh Ardiansyah Nurdin[1], Wahyu A. Lesmana[1]

[1] Faculty of Veterinary Medicine, Universitas Hasanuddin Makassar, Indonesia
[2] Department of Physiology and Pharmacology Magister, Bogor Agricultural University, Indonesia
* Corresponding author email: ameliaramadhanianshar@ymail.com

Abstract

Soursop leaf (*Annona muricata L.*) is predicted to have ability as a natural acaricide material for controlling ticks in cattle because it has acetogenin as bioactive compound. The purpose of the research was to know effectiveness of soursop leaf powder based on mortality of the cattle's ticks. Twelve cattles were randomly divided into 4 groups. Control group S1 got aquades, treatment group S2 got 20% of soursop leaf powder, treatment group S3 got 40% of soursop leaf powder and treatment group S4 got 60% of soursop leaf powder. The study was conducted over 12 hours, and then examined the ticks that were killed every 4 hours. The results were analyzed by one-way ANOVA then followed by T-test ($\alpha = 0.05$) if there were different. Test comparisons among the four groups after treatment with soursop leaf powder using an ANOVA test showed there were significant differences between the mean of the four groups of the cattle's ticks with $p<0.05$. In the treatment groups, 19 ticks, 39 ticks, and 72 ticks of S2, S3 and S4 were killed, respectively. The study showed that the powder of soursop leaf can kill ticks that infested the body of Brahman cross.

Keywords:

Tick, acaricide, soursop leaf (*Annona muricata L.*), cattle of Brahman cross

The microbiome of ticks in Malaysia

Jing Jing Khoo[1,*], Fang Shiang Lim[1,2], Chee Sieng Khor[1], Kim Kee Tan[1,2], Shih Keng Loong[1], Gilmoore G. Bolongon[3], Noor Azleen binti Mohd Kulaimi[4], Li Yen Chang[1,2], Sazaly AbuBakar[1,2,*]

[1] Tropical Infectious Diseases Research and Education Centre (TIDREC), Department of Medical Microbiology, University of Malaya, 50603 Kuala Lumpur
[2] Department of Medical Microbiology, University of Malaya, 50603 Kuala Lumpur
[3] Biodiversity Conservation Division, Department of Wildlife and National Parks, Peninsular Malaysia, KM 10 Jalan Cheras, 56100 Kuala Lumpur
[4] Ex-Situ Conservation Division, Department of Wildlife and National Parks, Peninsular Malaysia, KM 10 Jalan Cheras, 56100 Kuala Lumpur
* Corresponding author email: sazaly@um.edu.my, jing.khoo@um.edu.my

Abstract

Ticks serve as vectors of multiple pathogenic bacteria, viruses and piroplasms with medical and veterinary importance worldwide. Close contact with animal hosts infested with ticks may result in transmission of zoonotic pathogens from animal reservoirs to human. The emerging human disease associated with tick-borne virus, severe fever and thrombocytopenia syndrome virus (SFTS), is currently causing outbreaks in China, Korea and Japan with high mortality. In Malaysia, tick-borne diseases caused by bacteria and piroplasms such as Babesiosis, Ehrlichiosis, Theileriosis and rickettsial infection have been reported in both human and animals. Recent seroprevalence studies have also suggested past exposure of tick-borne encephalitis virus (TBEV) among farm workers in Malaysia. Research into the presence and transmission of tick-borne zoonotic pathogens is crucial in safeguarding human health.

In our laboratory, we aim to study the presence of tick-borne pathogens by using conventional molecular techniques and next-generation sequencing. The detection of bacteria and viruses are performed in ticks collected from farms, villages and forests in Malaysia. The bacterial communities in these ticks were investigated by 16s rRNA metagenomic sequencing, in which preliminary findings have revealed a diverse community of bacteria, including pathogens and endosymbionts. On-going efforts include expanding the microbiome investigation into ticks from all regions in Malaysia, as well as to intensify the discovery of zoonotic viruses in ticks. The findings in our laboratory provide the crucial baseline knowledge of the microbiome of ticks in Malaysia.

Keywords:

Tick, microbiome, Malaysia

Epidemiology of dengue in Hanoi, 2004–2014

Binh Thi Thanh Nguyen*, Cam Nhat Nguyen, Hanh Kim Hanh, Huong Thi Nguyen, Anh Ngoc Nguyen

Hanoi Preventive Medicine Centre, Hanoi, Vietnam
* Corresponding author email: Binhnguyen.hmu@gmail.com

Abstract

A cross-sectional study was applied to 38,531 dengue surveys of 29 districts in Hanoi, the result of which was to describe the epidemiologic characteristics of dengue fever according to time, space, age-stratified and serotypes of virus in Hanoi from 2004 to 2014. The results showed that dengue fever is an endemic disease in Hanoi with the average number hovering at 1,000 cases annually in almost of Hanoi's districts. In 2009, in which the proportion peaked at 200 per 100,000 people and was approximate 9-10 times more than the usual annual rate, witnessed only epidemic during 11-year period. The dengue cases were reported all month of year, but the number of cases increased in July before reaching a peak in October or November. After that, these fell a bottom in December. The age-stratified which was accounted for almost dengue cases in Hanoi was over 15 years old ($p < 0.00001$). All 4 serotypes of DENV were presented from 2009 to 2014 with DENV-1 and DENV-2 dominating.

Keywords:

Epidemiology, dengue fever, Hanoi, 2004-2014

Development of dengue vaccine: a systematic review of clinical trials

Lely Ophine*

Kaohsiung Medical University, Taiwan
* Corresponding author email: lely_os07@yahoo.co.id

Abstract

Dengue fever is a widespread viral illness affecting more than 50 million people each year. There is no effective treatment for dengue illness other than supportive care, especially for severe cases. Vector control has been only partially successful in decreasing dengue transmission. The potential use of safe and effective tetravalent dengue vaccines is an attractive addition to prevent disease or minimize the possibility of epidemics. There is an approved vaccine against dengue, although several approaches are under evaluations. This study systematically reviewed a development of dengue vaccines, incorporating data from 23 articles in PubMed. There is one vaccine candidate had done phase III clinical trial, 2 candidates in phase II clinical trial, and 8 candidates in phase I clinical trial, containing live attenuated, purified inactivated, and plasmid DNA. All of these vaccine candidates were safe, highly infectious, and broadly immunogenic when administered to healthy volunteers.

Keywords:

Dengue, vaccine, clinical trial

The fatality of *Plasmodium knowlesi* malaria in several Southeast Asia countries

Fauzi Budi Satria[1,*], Rahayu Lubis[2]

[1] Postgraduate student, Faculty of Public Health, University of North Sumatera, Indonesia
[2] Department of Epidemiology, Faculty of Public Health, University of North Sumatera, Indonesia
* Corresponding author email: fauzibudisatria@gmail.com

Abstract

Plasmodium knowlesi malaria has been regularly reported in several ASEAN countries, or travelers from that area. Most of them were misdiagnosed by other malaria types, and was treated improperly. The objective of this writing was to identify, predict or describe the fatality of *Plasmodium knowlesi* as the fifth type of malaria infection in several countries in Southeast Asia. The method of this study was literature review. The data were collected from some published journals about *Plasmodium knowlesi* in Southeast Asia countries. The results found that it has been reported 4 died patients caused by malaria with hyperparasitemic and hepatorenal disturbance in Malaysia, only *Plasmodium Knowlesi* DNA alone was detected in each patient. The prevalence of *Plasmodium knowlesi* in Malaysia was reported much more higher than Thailand, while any other ASEAN countries like Indonesia, Myanmar, Philippines, Singapore and Vietnam was being observed. This infection causes any symptoms rapidly, and almost 7% of all cases was reported as severe life-threatening infection with multiple organ failure. Nowadays, severe *Plasmodium knowlesi* malaria is treated like severe infection of *Plasmodium falciparum* malaria. But, some countries reported that the number of resistance in malaria treatment is highly increased. In conclusion, severe case of *Plasmodium knowlesi* infection can cause death, while the number of cases that diagnosed with this infection was highly increased in recent years. The severe *Plasmodium knowlesi* infection is treated like severe *Plasmodium falciparum* malaria. But the increased resistance in *Plasmodium falciparum* malaria treatment cause a new major problem in treating not only patient with deadly *Plasmodium falciparum* infection, but also severe *Plasmodium knowlesi* infection. This problem should be fixed by proper diagnostic, mapping system and adequate treatment.

Keywords:

Malaria, *Plasmodium knowlesi*, fatality, Southeast Asia

Microbiological quantitative assessment of poultry carcasses from large-scale slaughterhouses in Chiang Mai province, Thailand

Chalita Jainonthee[1],*, Warangkhana Chaisowwong[1,2], Tongkorn Meeyam[1,2], Yuttana Chanayat[3], Phakamas Ngamsanga[4], Duangporn Pichpol[1,2]

[1] Veterinary Public Health Centre for Asia Pacific, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, 50100 Thailand
[2] Department of Veterinary Biosciences and Veterinary Public Health, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, 50100 Thailand
[3] Central Laboratory, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, 50100 Thailand
[4] Excellent Center of Veterinary Public Health, Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, 50100 Thailand
* Corresponding author email: vphcap.res@gmail.com

Abstract

The study was conducted in June to November 2016 to identify and quantify the number of *Campylobacter jejuni* and *Staphylococcus aureus* contaminated in poultry carcasses from large-scale slaughterhouses, which has capacity more than 10,000 head per day, located in Chiang Mai province. A total of 72 carcass rinsing samples were randomly collected along the slaughtering production line at 4 different points; after bleeding, after evisceration, after washing and at chilling step. *Campylobacter jejuni* was identified with standard method (ISO10272) and subsequently quantified by direct plating technique. After confirmation by multiplex PCR, 56.94% (41/72) of the samples were positive with *C. jejuni* and the mean concentration at different points were 1.48, 2.79, 2.38 and 1.65 log CFU/ml, respectively. The result of identification and enumeration of coagulase-positive *S. aureus*, it found that 54.17% (39/72) of the samples were positive and the mean concentration at different points were 1.45, 2.39, 1.61 and 0.88 log CFU/ml, respectively. In conclusion, *Campylobacter jejuni* and *Staphylococcus aureus* are foodborne pathogens that can be found in poultry carcasses. Evisceration step was suggested to be the point of concern in slaughtering production line due to operation at this step promoted the higher number of pathogens. However, risk factors of contamination are recommended for the further study.

Keywords:

Quantitative assessment, poultry, *Campylobacter jejuni*, *Staphylococcus aureus*, slaughterhouse

Antimicrobial susceptibility of *Streptococcus* isolated from respiratory infected pigs at the farms around Thua Thien Hue province, Vietnam

Pham Hoang Son Hung*, Nguyen Xuan Hoa, Phan Vu Hai

Hue University of Agriculture and Forestry, Vietnam
* Corresponding author email: Phamhoangsonhung@huaf.edu.vn

Abstract

The objective of the study was to assess trends in the prevalence and distribution of gram-negative bacteria isolated from pigs that have respiratory infections and determine specific biochemical characteristics of *Streptococcus suis* and their antimicrobial susceptibilities of isolated *S. suis* strains. *Streptococcus suis* are bacteria that usually parasite in the pig's mucosa of the upper respiratory tract. *Streptococcus suis* is a genus of coccus gram-positive bacteria, which has an ability to induce hemolysis and to form neurotoxins. When the pig's resistance decreases because of factors such as weather, transporting, weaning, or joining herd, the bacteria will increase in quantity and produce toxins, which cause diseases of the animal. Our research was conducted in order to choose the appropriate vaccine for the prevention and treatment of *S. suis* disease in pig. There were 40 *Streptococcus* spp. strains that were isolated from 106 samples (27.7%). The majority of the isolated *Streptococcus* spp. strains were γ-haemolytic, some were β-haemolytic, and no α-haemolytic. Generally, gram-negative bacteria *Streptococcus* spp. strains were susceptible to Cefotaxime or Oxacillin 80%; however, they had highly resistance to Trimethoprime/ Sulfamethoxazol, Penicillin, and Erythromycin. The results had important meaning to apply in research and in the usage of Cefotaxime and Oxacillin in the prevention and treatment of *Streptococcus suis* disease in pig at farms in Thua Thien Hue province and other provinces.

Keywords:

Antimicrobial resistance, respiratory, *Streptococcus suis*, susceptibility, Thua Thien Hue province

Knowledge and practices towards rabies: questionnaire survey in school children of Kathmandu district, Nepal

Rakesh Chand*

National Zoonoses and Food Hygiene Research Centre, Nepal
* Corresponding author email: rakeshchandvet@gmail.com

Abstract

Canine rabies kills 55,000 people per year in developing countries with 100-200/year in Nepal alone. Fifty percent of the deaths due to rabies are among children under 15 years of age. Information about local beliefs and practices can identify knowledge gaps that may affect prevention practices and lead to unnecessary deaths. Hence, this cross-sectional study was conducted to assess the knowledge and practice of school children towards rabies. Four schools of Kathmandu district were purposely selected and 351 students of grade 8, 9 and 10 were surveyed. With school education being the major source of information (54.2%), the majority (91.5%) replied that they have heard about rabies, but when specific questions relating to the disease were asked the correct/ closest answers kept declining. About 80.7% knew the dog bite as the transmitting factor and 11.8% only knew about all the signs of rabies. With the dog being the commonest pet (90.4%), only 23.6% were pet owners and 75.9% vaccinated their pets against rabies. The 55.4% pet dogs had access to the community/stray dogs. Bite cases were high with 56.7% children knowing someone who has been bitten and about 28.5% were bitten by a dog. About 55% replied of not having provoked the dog and in the majority of the instances (69%) the dog ran away after biting. Hospital based treatments (72%) and PEP/vaccination (64%) were common. A significant association was seen between knowledge/practice towards rabies and types of school, pet ownership and grade of students. These findings demonstrated that although the majority of the children knew about rabies, still there seemed to be a knowledge gap or incompletely informed group of people. Therefore, effective awareness must be conducted starting from the school level as one of the important means of battling rabies in Nepal.

Keywords:

Rabies, student survey, cross-sectional study, dog bite, Nepal

Note

Note