Dean’s Lecture Series
College of Public Health
University of South Florida

by
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Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak (UNIMAS)

17th October, 2012

Outline

• Introduction to UNIMAS
• Introduction to Sarawak
• Public Health Information of Malaysia/Sarawak
• Community Health Assessment in Salak Island
An introduction to UNIMAS

Eighth public university in Malaysia
Established on 24th Dec, 1992.
Main campus: Kota Samarahan
City campus: Kuching (Faculty of Medicine and Health Sciences)
UNIMAS has 8 faculties, 5 institutes and 8 centers
Governance: Vice Chancellor and 3 Deputy Vice Chancellors
  (Research and Innovation, Academic Affairs & Student Affairs), Registrar, Librarian, Treasurer.
Student: undergraduate (9,280)
  postgraduate (890) PhD (143)
Academic Staff: 745

MOU of UNIMAS/USF was established in 2005.
An introduction to UNIMAS

Faculty of Medicine and Health Sciences

- Located in Kuching city, 25 km from Kota Samarahan
- Consists of 13 Departments (2 non-clinical departments)
- Department of Public Health and Community Medicine receive IFE students.
Faculty of Medicine and Health Sciences

- Department of Public Health and Community Medicine received 5 International Field Experience students since 2007 after the signing of MOU in April 2005.
- Joined field trips organized by Sarawak State DOH and get exposure to various public health activities.
- Lists of IFE students from Department of Global Health USF
  1) Matthew Weissenbach- 2007
  2) Ellen McCready- 2008
  3) Rachael Werth Price- 2009
  4) Karen Dindial-2010
  5) Amelia Johnson-2011

An introduction to Sarawak, Malaysia

Malaysia on world map
Map of Malaysia: West & East Malaysia

An introduction to Sarawak

- Sarawak is on Borneo Island, 3rd largest island in the world. Malaysia shares the island with Brunei and Kalimantan, Indonesia.

- Sarawak is the largest of Malaysia 13 states. Area: 124,449 km² (48,050 mi²), immediately north of the Equator (Florida: 65,750 mi²)
Population of Sarawak

- Total population: ~ 2.5 million (Malaysia ~ 29 million)
- Ethnic groups: 27
  - Iban (30%)
  - Chinese (24%)
  - Malay (23%)
  - Bidayuh (8%)
  - Melanau (6%)
  - Orang Ulu (6%)
  - Others (3%)
- Language spoken: Iban, Bidayuh, Malay, Cantonese, Hokkien...
- Formal language: Bahasa Malaysia and English

Capital city of Sarawak: Kuching
Capital city of Sarawak: Kuching

Sarawak Regatta

Rainforest World Music Festival 2012
Attractions in Sarawak

- Rafflesia
- Hornbill
- Proboscis monkey
- Crocodile

Climate of Sarawak

Monsoon season: November to February
Average daily temperature range: 23°C - 32°C

Rainforest in Lambir, Sarawak
Sarawak Geography

Three principal terrain groups:
- the alluvial coastal plain
- the central belt of undulating terrain,
- the mountainous interior

Alluvial coastal plain: mangrove, peat soil and swamp forest

Salak River and mangrove

Bakau mangrove

Nipah mangrove
Undulating terrain: gently undulating terrain, most suitable for development and where most population are concentrated.

Mountainous interior (300-2400km ASL), thick primary forest, highlands and numerous rapids and rivers

Rapids of Baram River
Public Health Information of Malaysia/ Sarawak

Some Malaysia Health Facts

Total population of Malaysia: 29 million
Ratio of male to female 1:1
Annual population growth rate: 1.3%
Infant mortality rate (per 1,000 live birth : 6.8 (2010)
Life expectancy at birth: Male 71.9 years (2010)
Female 77.0 years (2010)

Department of Survey and Mapping, Malaysia
Department of Statistics, Malaysia

Public Health Information of Malaysia/ Sarawak

Healthcare in Malaysia

• Under the Ministry of Health Malaysia
• Two-tier health system: public sector and private sector
• Government social sector development budget (7.25%~ 16Billion)
• Under National Mission Thrust and to achieve Vision 2020, one of the focus is to improve the standard and sustainability of quality of life:
  1) transforming the delivery of the healthcare system
  2) increasing the quality, capacity and coverage of healthcare infrastructure
  3) shifting towards wellness and diseases prevention
  4) increasing the quality of human resource for health
Public Health Information of Malaysia/Sarawak

Healthcare in Sarawak

- Sarawak Healthcare System is under the Ministry of Health Sarawak
- Health service delivery system in Sarawak include static and mobile facilities
- Coverage: Static facilities: General/District/Special Institutions/Health Clinics (70%),
  Mobile facilities: Village Health Teams & Flying Doctor Service (20%)
- Introduction of Village Health Promoters (VHP) in 1983
  - two volunteers undergo three weeks training to enable them provide basic healthcare to their respective villagers.
- The type of health facility in an area depends on the size of the population of the respective area.

Incidence Rate and Mortality Rate of Communicable Diseases, 2011

<table>
<thead>
<tr>
<th>Disease</th>
<th>Incidence Rate</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>71.35</td>
<td>5.68</td>
</tr>
<tr>
<td>Dengue</td>
<td>63.75</td>
<td>0</td>
</tr>
<tr>
<td>Dengue Hemorrhagic Fever</td>
<td>4.9</td>
<td>0.12</td>
</tr>
<tr>
<td>Food-poisoning</td>
<td>56.25</td>
<td>0.03</td>
</tr>
<tr>
<td>Hand, foot and mouth disease</td>
<td>24.17</td>
<td>0</td>
</tr>
<tr>
<td>Malaria</td>
<td>18.32</td>
<td>0.06</td>
</tr>
<tr>
<td>HIV</td>
<td>12.01</td>
<td>0.04</td>
</tr>
<tr>
<td>AIDS</td>
<td>4.61</td>
<td>1.97</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>7.83</td>
<td>0.19</td>
</tr>
<tr>
<td>Cholera</td>
<td>2.02</td>
<td>0.04</td>
</tr>
</tbody>
</table>
## Vector borne diseases in Sarawak

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year 2009</th>
<th>Year 2010</th>
<th>Year 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>2,158 (8)</td>
<td>2,801 (5)</td>
<td>1,761 (2)</td>
</tr>
<tr>
<td>Dengue/DHF</td>
<td>4,568 (7)</td>
<td>4,240 (14)</td>
<td>974 (0)</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>3 (1)</td>
<td>4 (0)</td>
<td>9 (2)</td>
</tr>
<tr>
<td>Filarisis</td>
<td>83 (0)</td>
<td>0 (0)</td>
<td>10 (0)</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>2,502 (0)</td>
<td>550 (0)</td>
<td>6 (0)</td>
</tr>
<tr>
<td>Scrub thypus</td>
<td>1 (0)</td>
<td>0</td>
<td>1 (0)</td>
</tr>
<tr>
<td>Plague</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yellow fever</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Sarawak Health Department

## Current statistics on vector borne diseases in Sarawak

<table>
<thead>
<tr>
<th>Disease</th>
<th>Week 35 2012, (cum)</th>
<th>Week 35 2011,(Cum) (total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>24 (907)</td>
<td>26 (1151) (1761)</td>
</tr>
<tr>
<td>Dengue/DHF</td>
<td>34 (706)</td>
<td>10 (682) (974)</td>
</tr>
<tr>
<td>Japanese encephalitis</td>
<td>0 (5)</td>
<td>0 (-) (9)</td>
</tr>
<tr>
<td>Filarisis</td>
<td>0 (11)</td>
<td>0 (-) (10)</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>1 (4)</td>
<td>0 (-) (6)</td>
</tr>
<tr>
<td>Scrub thypus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Plague</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Sarawak Epidemiological News (SWEN)  
Epid. Week 35, 26th Aug-1st Sept 2012
Important disease vectors in Sarawak

Vectors: *Ae. albopictus* and *Ae. aegypti*
Pathogen: Dengue serotype I-IV, chikungunya virus

Vectors: *An. latens*, *An. balabacensis*, *An. sundaicus*, *An. dirus*
Parasites: *Plasmodium falciparum*, *P. vivax*, *P. malariae*, *P. ovale*, *P. knowlesi*

Vector: *Mansonisa sp.*
Parasites: *Brugia malayi* (filarial worm)

Vector: *Culex sp.*
Parasites: *Japanese encephalitis virus*

Management, control and surveillance of vectors

1) Sarawak Health Department, Ministry of Health, Malaysia
2) Local authority: city councils
   - Kuching South City Council (MBKS)
   - Kuching North City Council (DBKU)
Surveillance by Sarawak Health Department

Setting an ovitrap

Surveillance by Sarawak Health Department

Mosquito larvae identification
Mosquito controls by city councils

Ultra low volume (ULV) spraying conducted by city councils in areas where dengue cases are reported.
Public awareness towards dengue and control of *Aedes* mosquito are disseminated through campaigns

- Talks
- Posters
- Commercials (TV, Radio)
- DVDs

Community Health Assessment in Salak Island, Sarawak, Malaysian Borneo
Salak Island is situated north of Kuching city

- Pulau Salak is a small village situated at the river delta near Santubong.
- Settlement: 150 years ago
- Distance: about 40 minutes drive from Kuching and 30 minutes boat ride from Daun River jetty
- Population of 700 people
- Houses: ~ 150
- Transportation: boat
- Economic activity: fishing
Salak Island is declared as a protected wetland

Infrastructures in Salak Island

Community hall

Football field

Mosque
Elementary School

School ends at 12.40pm

Resource room

Pre-school (Kindergarten)
Challenges living on Salak Island:

- Houses are on a muddy mangrove area
- Low rise of water leaves trashes underneath houses
- No treated water supply (wells and rain water)
- No electricity (use generators)
- No proper waste disposal
- No proper sanitation
- No health clinics

Water supply
Health Issues at Salak Island

- Nearest clinic is Buntal Village but most villagers either go to Santubong Village or straight to the polyclinics in city centre with better facilities.
- Mobile Clinics monthly visit to the island was terminated: The village is considered close to the city centre.
- They also do not have a village health promoters (VHP)

Emergency cases

- Boat ride from the village to jetty then road transport to city center.
- Boat transportation relies on tides.
- A number of emergency cases reported:
  1) Pregnant mothers delivered in boats
  2) A villager died of heart attack in boat
- Reports of boat accidents especially at night.
Land Issues

- All lands are without titles.
- Plan to re-locate the villagers to low cost housing in Pasir Pandak village but have not reached any agreement.
- There are two actively operating quarries on the island:
  1) threat to water supply from the well,
  2) threat of landslide
  3) occupational hazards to villagers
Why preliminary research on Salak Island?
The areas of study

a) Nutritional status – anthropometric measurements of all ages and self-administered questionnaire

b) Cardiovascular risk factors – fasting blood sampling, blood pressure measurement, BMI (using (a) above) and self-administered questionnaire on adults 18 years and above.

c) Respiratory function – Physical examination and Lung function test on quarry workers and all adults 18 years and above and a self-administered questionnaire.

d) Family function and harmony – self administered questionnaire

e) Traditional medicine practice – self-administered questionnaire

f) Parasitic infection – stool sample of children < 12 years, and guided questionnaire.

g) Entomological survey– survey of water containers in and around the village for larvae collection and analysis- self administered questionnaire

Methodology

A month before survey:
A phone call to the village head by project leader, Dr. Haironi Yusoff (Family Health)

A week before survey:
Meeting was set up with village head to discuss the logistic (generator, boats, food) and distribution of stool containers (intestinal helminth survey) and setting of mosquito traps (ovitraps).
Methodology

Participant registered and demographic information recorded

Sign consent form

Anthropometric measurement

Blood pressure check and blood test

Spirometric measurement

Further self-administered questions on family function, traditional medicine used and parasitic and vector borne diseases

Methodology

Fasting blood sampling, blood pressure measurement and self-administered questionnaire were excluded from participant less than 18 years old.
Methodology: Field entomological survey

Number of house: 35  
Each house: 3 ovitraps  
Locations of ovitraps: verandah  
living room  
kitchen  
Total ovitraps distributed: 105

Results

Socio demographic of participants

Age distribution of participants

Below 18: 31  
20-39 years old: 11  
40-59 years old: 23  
60-79 years old: 9  
80-99 years old: 1  
TOTAL: 75
Results

Socio demographic of participants

Gender and marital status

Income: Mean income was RM216.67 (±SD 553.2), with a range of RM0-RM3,700. (USD 67.7)
Medical screening: BMI

38.6% of the respondents were overweight or obese.

Results: Cardiovascular risk factors

Medical screening: Blood pressure, cholesterol level and glucose level

- Blood pressure: 4% were hypertensive
- Cholesterol level: 28% had high cholesterol levels (Mean: 5.27) (SD ± 0.98).
- Glucose levels: all had normal sugar levels (Mean 6.2 mmol/dl (SD ± 1.01).
Results: Entomological survey

Vector-borne diseases history

45.33% of the participants had chikungunya infection
1 participant had dengue fever in the past.

Results: Field entomological survey

Container index and house index:

<table>
<thead>
<tr>
<th>Total ovitraps distributed: 105</th>
<th>Percentage recovery: 76%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ovitraps recovered: 80</td>
<td></td>
</tr>
<tr>
<td>Number of positive ovitraps: 45</td>
<td>Container index (% of positive ovitraps): 45/80 = 0.56</td>
</tr>
<tr>
<td>No. of house given ovitraps: 35</td>
<td>No. of house ovitraps recovered: 28</td>
</tr>
<tr>
<td>No. of house with positive ovitraps: 24</td>
<td>House index (% of positive house): 24/28: 0.86</td>
</tr>
</tbody>
</table>
Results: Field entomological survey

Mosquito species identified:

<table>
<thead>
<tr>
<th>Mosquito</th>
<th>No of positive ovitraps</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ae. albopictus</em></td>
<td>16</td>
</tr>
<tr>
<td><em>Ae. aegypti</em></td>
<td>4</td>
</tr>
<tr>
<td><em>Ae. albopictus</em> &amp; <em>Ae. aegypti</em></td>
<td>24</td>
</tr>
<tr>
<td><em>Ae. albopictus, Ae. aegypti</em> &amp; <em>An. sundaicus</em></td>
<td>1</td>
</tr>
<tr>
<td>Eggs only</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>45(80)</td>
</tr>
</tbody>
</table>

Conclusions

• There ARE health issues on villagers in Salak Island.
• Almost 39% are overweight and obese despite low income level.
• Almost 1/3 of the participants have hypercholesterolemia.
• However percentage of participants with high blood pressure is low and blood glucose level of participants are normal.
• Entomological survey showed high house and container index for potential vector mosquitoes.
• Further intervention is necessary.
• Health awareness talks and campaign need to be disseminated to the villagers of Salak Island.
Potential research areas for future IFE students

- Cardiovascular risks factor
- Nutritional status
- Respiratory disease
- Traditional medicine
- Vector surveillance
- Parasitic and vector borne diseases
Acknowledgement

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Hillborough County Mosquito Control Division

UNIMAS
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Prof Ahmad Hata Rasit Dean of Faculty of Medicine and Health Sciences, UNIMAS
Prof Dr Tan Sri Taha Arif,
Dr Haironi Yusoff (project leader)
Ms Khatijah Yaman (entomological data)
Amy Lim (photographs)
Staff and students involved in Salak Island Preliminary research

Salak Island Research Team (July, 2012)
Salak fruit and Salak tree
Public Health Information of Malaysia/Sarawak

Notification of vector borne diseases in Sarawak:

Within 24 hours
• Malaria
• Dengue & DHF
• Plague
• Yellow Fever

Within 1 week
• Japanese encephalitis