



## 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)

17<sup>th</sup> 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 24<sup>th</sup> 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





## 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.





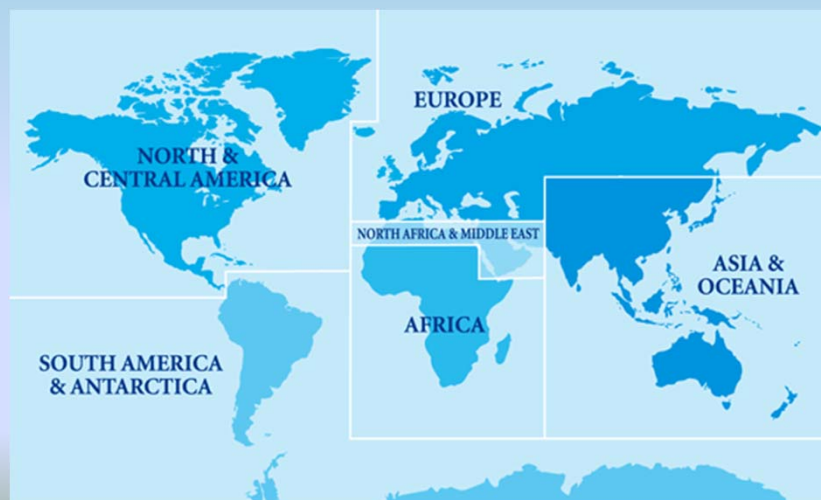
## Faculty of Medicine and Health Sciences

- 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 McCreedy- 2008
  - 3) Rachael Werth Price- 2009
  - 4) Karen Dindial-2010
  - 5) Amelia Johnson-2011



## An introduction to Sarawak, Malaysia

Malaysia on world map





**An introduction to Sarawak**

- Sarawak is on Borneo Island, 3<sup>rd</sup> 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 km<sup>2</sup> (48,050 mi<sup>2</sup>), immediately north of the Equator (Florida: 65,750 mi<sup>2</sup>)





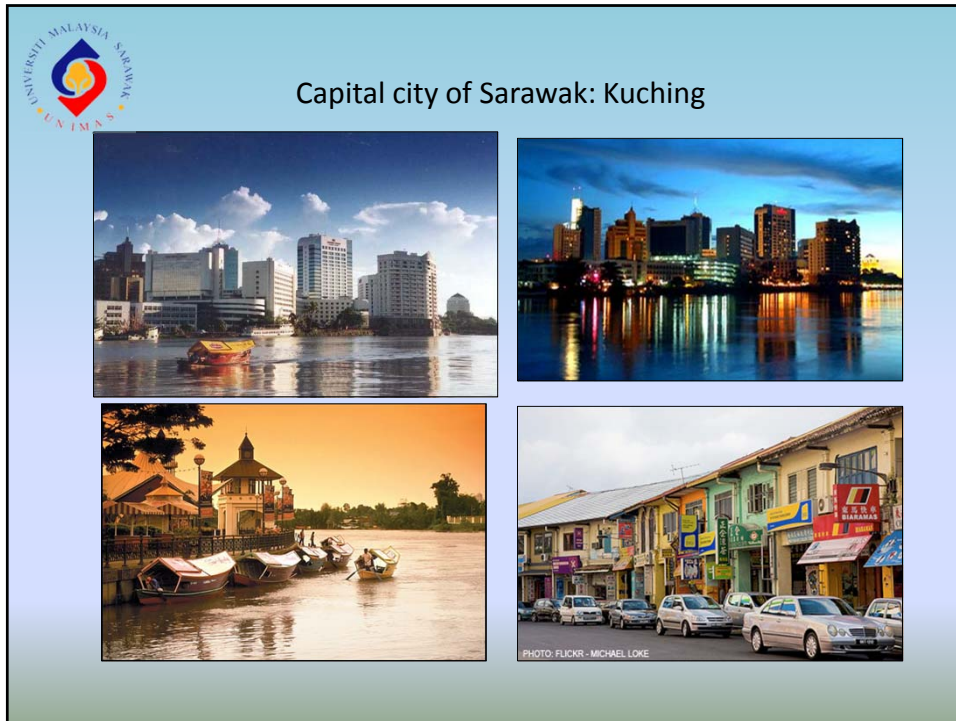
## Population of Sarawak


- 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

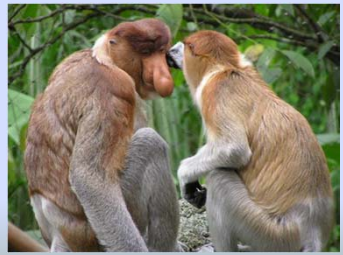






 Attractions in Sarawak

  
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

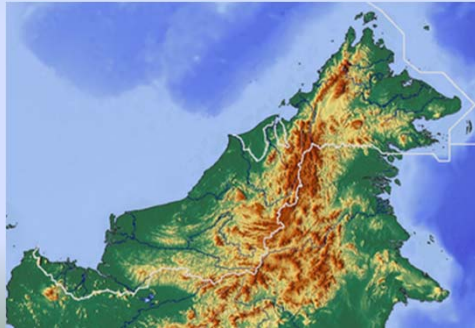




## Sarawak Geography

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 (300-2400m 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

Disease	Incidence Rate	Mortality Rate
Tuberculosis	71.35	5.68
Dengue	63.75	0
Dengue Hemorrhagic Fever	4.9	0.12
Food-poisoning	56.25	0.03
Hand, foot and mouth disease	24.17	0
Malaria	18.32	0.06
HIV	12.01	0.04
AIDS	4.61	1.97
Leptospirosis	7.83	0.19
Cholera	2.02	0.04

Health Facts 2012 Ministry of Health Malaysia





### Vector borne diseases in Sarawak

Disease/Year	2009	2010	2011
Malaria	2,158 (8)	2,801 (5)	1761 (2)
Dengue/DHF	4,568 (7)	4,240 (14)	974 (0)
Japanese encephalitis	3 (1)	4 (0)	9 (2)
Filariasis	83 (0)	0 (0)	10 (0)
Chikungunya	2,502 (0)	550 (0)	6 (0)
Scrub thypus	1 (0)	0	1 (0)
Plague	0	0	0
Yellow fever	0	0	0

Sarawak Health Department



### Current statistics on vector borne diseases in Sarawak

Disease	Week 35 2012, (cum)	Week 35 2011,(Cum) (total)
Malaria	24 (907)	26 (1151) (1761)
Dengue/DHF	34 (706)	10 (682) (974)
Japanese encephalitis	0 (5)	0 (-) (9)
Filariasis	0 (11)	0 (-) (10)
Chikungunya	1(4)	0 (-) (6)
Scrub thypus	-	-
Plague	-	-

Sarawak Epidemiological News (SWEN)  
Epid. Week 35, 26<sup>th</sup> Aug-1<sup>st</sup> 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: *Mansonia* sp.

Parasites: *Brugia malayi* (filarial worm)

Vector: *Culex* sp.

Parasites: *Japanese encephalitis virus*



*Ae. aegypti*



*Ae. albopictus*



## 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.







Vector Control Unit,  
Jalan Patungan,  
93675 Kuching,  
Tel: 242311 Ext: 240  
Ext: 243

**MALIS BANDARAYA KUCHING SELATAN**  
COUNCIL OF THE CITY OF KUCHING SOUTH

Jabatan Kesihatan Awam  
**NOTIS**

Untuk mengawal rebukan penyakit Demam Denggi/Demam Denggi Berdarah, kakitangan Kawalan Vektor dari Majlis Bandaraya Kuching Selatan akan menjalankan pengaburan racun serangga di kawasan anda bagi tujuan menghapuskan nyamuk-nyamuk *Aedes* pada tarikh, 27 MAR 2012  
(Time) 5-7pm

Orang yang dimarah anda diminta menurut semua makanan dari kemungkinan terkena racun serangga. Kerjasama anda adalah sangat-sangat dibenarkan.

"Sila ambil perhatian bahawa operasi pengaburan uhar akan ditunda jika cuaca kurang baik"

Tarikh 27 MAR 2012 Pen. Peg. Kesihatan Persekutuan

Public Health Department  
**NOTICE**

To prevent the transmission of Dengue Fever/Dengue Haemorrhagic Fever, the Vector Control Staff of the Council Of City South has to carry out insecticidal fogging in your area to destroy *Aedes* mosquitoes on the (Date) 27 MAR 2012  
(Time) 5-7pm

You are advised to keep all your food covered to avoid contamination by insecticides. Your close co-operation with us will be greatly appreciated.

"Fogging operation may be postponed if weather is unfavourable"

Date 27 MAR 2012 Pen. Peg. Kesihatan Persekutuan

古晉南市政局公共衛生局  
**通告**

南市政局衛生局為了預防骨痛熱症/骨痛瀉血症之蔓延，必須採取一項控制此病症之措施，將於 27 MAR 2012 時間 5-7pm 到府上噴霧殺蚊，防止傳播。

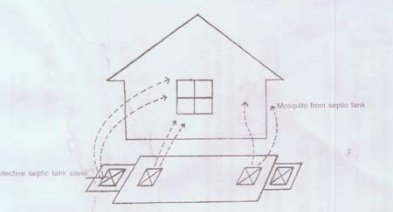
為了避免食物遭受污染，台端必須將它們妥當收藏，您的合作，市政局深表感激。

如遇下雨，噴霧工作將延期進行。

日期: 27 MAR 2012 衛生官



**UNIVERSITI MALAYSIA SARAWAK**  
**UNIMAS**



1. YOUR COMPOUND MAY BE CLEAN, BUT YOU MAY STILL EXPERIENCE MOSQUITO NUISANCE. THE SOURCE COULD BE YOUR SEPTIC TANK.

2. THE COMMON FAULTS WHICH CAUSE OR ALLOW MOSQUITO BREEDING IN YOUR SEPTIC TANK.

3. STEPS TO BE TAKEN TO GET RID OF MOSQUITO NUISANCE ARISING FROM YOUR SEPTIC TANK.

REMINDER:  
UNDER THE DESTRUCTION OF DISEASE BEARING INSECTS ACT 1975, HOUSE OWNER / OCCUPIER OF ANY PREMISES IS LIABLE TO BE FINED OR PROSECUTED IN COURT IF AEDES MOSQUITOES ARE FOUND BREEDING IN YOUR HOME ENVIRONMENT INCLUDING SEPTIC TANK.

AEDES MOSQUITOES BREEDING IN YOUR SEPTIC TANK CAN INFECT YOU AND YOUR FAMILY WITH DENGUE FEVER.

**ACT TODAY !!**

Designed and produced by:  
Vector Control Unit MBKS

**TANDA-TANDA DEMAM DENGGI**  
并发症的状态

**AEDES MEREBAKKAN DEMAM DENGGI**  
黑斑蚊传染骨痛热症

**NYAMUK AEDES MEMBIAK DI DALAM RUMAH**  
黑斑蚊繁殖在屋内

**EDARAN HIDUP NYAMUK AEDES (AEGYPTII)**  
黑斑蚊繁殖的过程

**KAWALAN DENGGI DENGAN MENYEKAT NYAMUK AEDES DARI MEMBIAK**  
防止黑斑蚊繁殖来预防骨痛热症

**TIADA AEDES TIADA DENGGI**  
没有黑斑蚊就没有骨痛热症

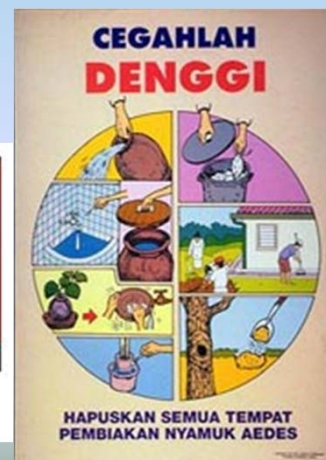
**EDARAN HIDUP NYAMUK AEDES (AEGYPTII)**  
黑斑蚊繁殖的过程

Edaran Hidup Aedes dari awal kebiasannya. Aedes biasanya menggigit pada waktu ari-ari. Aedes membiak didalam air jernih sahaja. Aedes biasanya tinggal dalam air jernih sahaja. Aedes biasanya tinggal dalam air jernih sahaja.

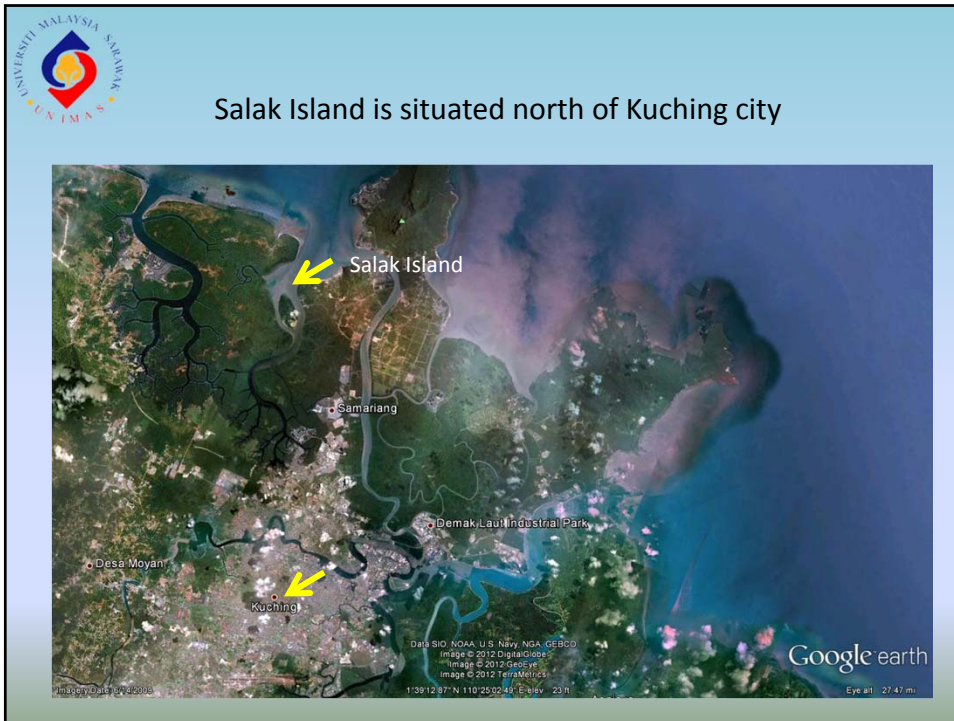



Public awareness towards dengue and control of *Aedes* mosquito are disseminated through campaigns



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



### Community Health Assessment in Salak Island, Sarawak, Malaysian Borneo

- 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)



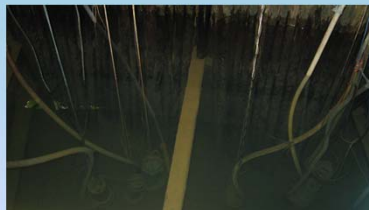


### Challenges living on Salak Island:

- 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









### 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:

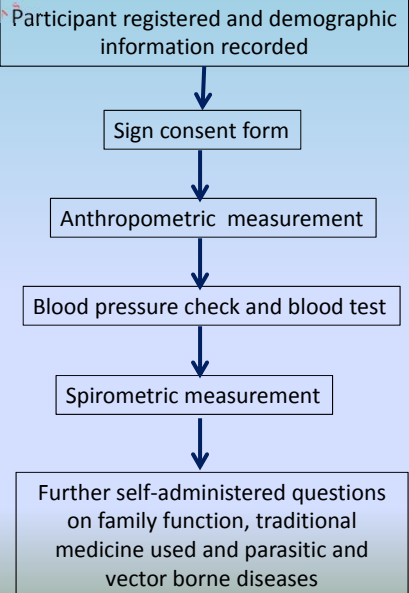
A phone call to the village head by project leader, Dr. Haironi Yusoff (Family Health)

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**



```

graph TD
    A[Participant registered and demographic information recorded] --> B[Sign consent form]
    B --> C[Anthropometric measurement]
    C --> D[Blood pressure check and blood test]
    D --> E[Spirometric measurement]
    E --> F[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



Ovitraps

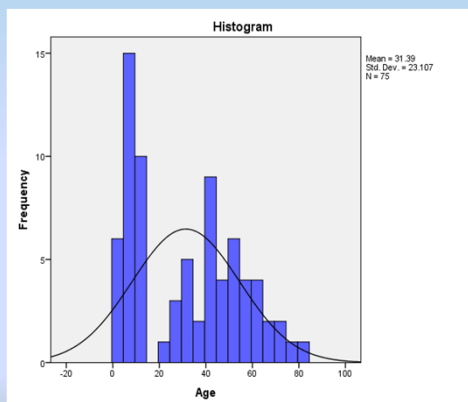


## Results

### 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**

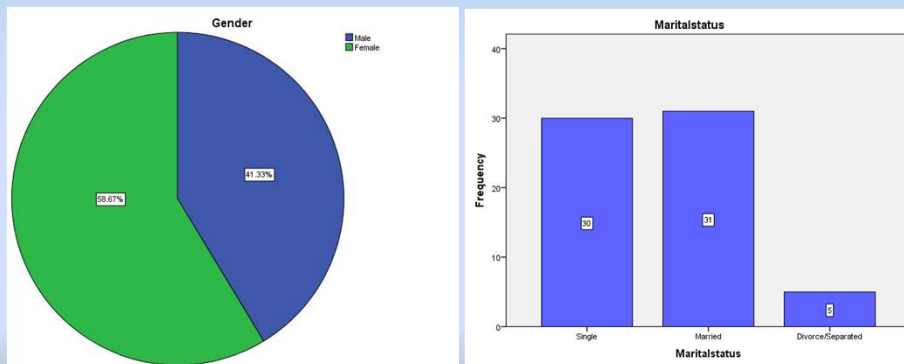




## Results

### Socio demographic of participants

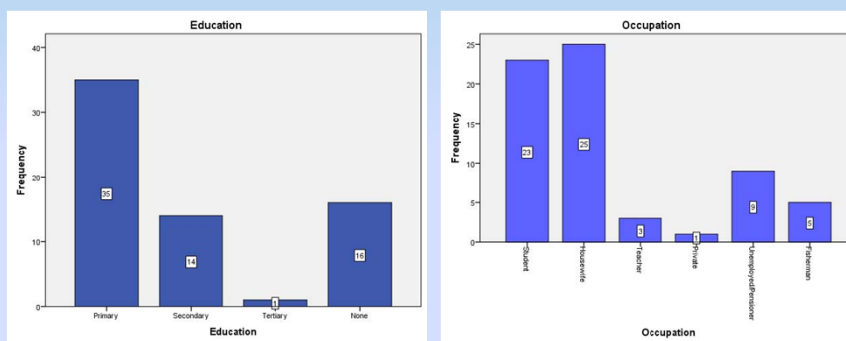
#### Gender and marital status



## Results

### Socio demographic of participants

#### Education, occupation and income level



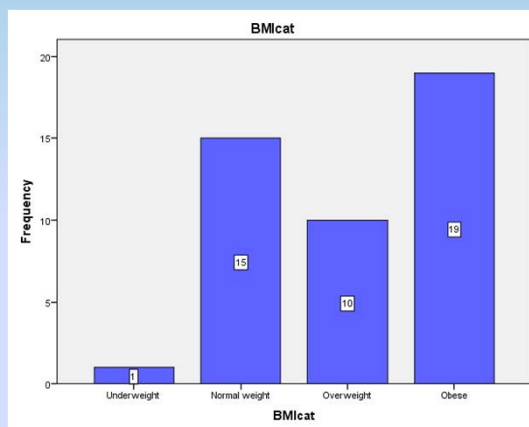
Income: Mean income was RM216.67 ( $\pm$ SD 553.2), with a range of RM0-RM3,700.  
(USD 67.7) (USD 0- 1156.25)





## Results: Cardiovascular risk factors

Medical screening: BMI

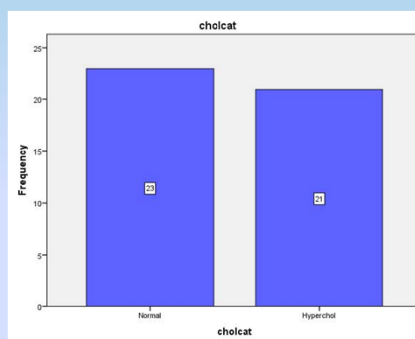
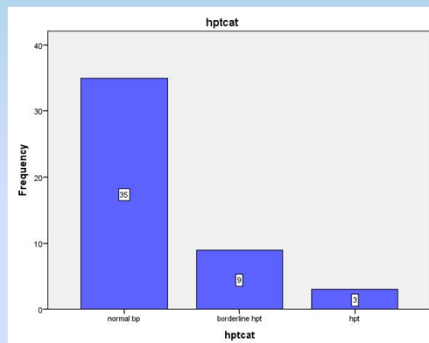


38.6% of the respondents were overweight or obese.



## Results: Cardiovascular risk factors

Medical screening: Blood pressure, cholesterol level and glucose level

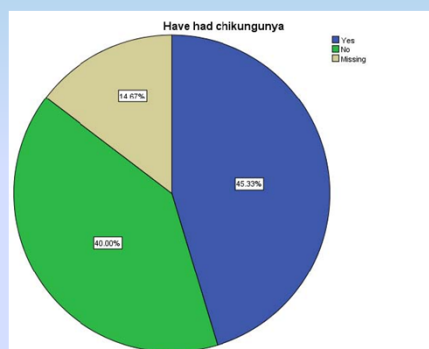


- Blood pressure: 4% were hypertensive
- Cholesterol level: 28% had high cholesterol levels (Mean:5.27) (SD  $\pm$  0.98).
- Glucose levels: all had normal sugar levels (Mean 6.2 mmol/dl (SD  $\pm$  1.01).



## 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:

<b>Total ovitraps distributed: 105</b>	<b>Percentage recovery: 76%</b>
<b>Total ovitraps recovered: 80</b>	
<b>Number of positive ovitraps : 45</b>	<b>Container index (% of positive ovitraps):</b>
	<b>45/80 = 0.56</b>

<b>No. of house given ovitraps: 35</b>	<b>Percentage of recovery: 80%</b>
<b>No. of house ovitraps recovered: 28</b>	
<b>No. of house with positive ovitraps: 24</b>	<b>House index (% of positive house):</b>
	<b>24/28: 0.86</b>



## Results: Field entomological survey

Mosquito species identified:

Mosquito	No of positive ovitraps
<i>Ae. albopictus</i>	16
<i>Ae. aegypti</i>	4
<i>Ae. albopictus</i> & <i>Ae. aegypti</i>	24
<i>Ae. albopictus</i> , <i>Ae. aegypti</i> & <i>An. sundaicus</i>	1
Eggs only	12
Total	45(80)



## Conclusions

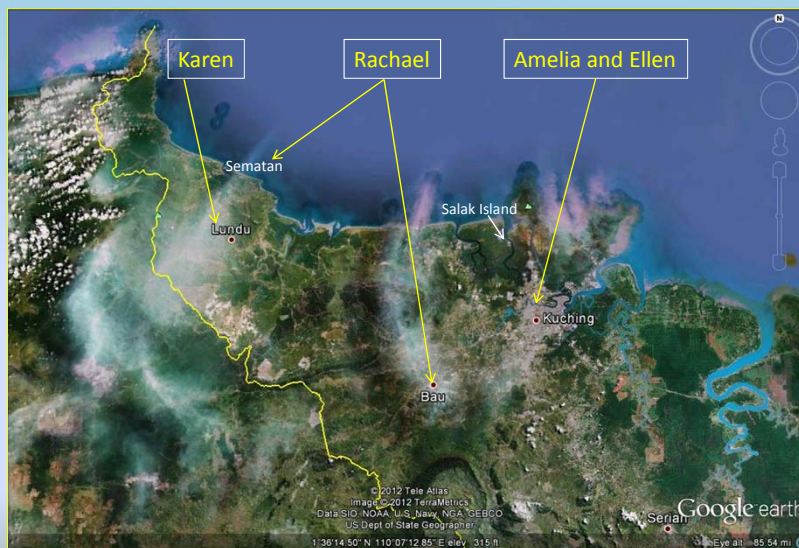
- There ARE health issues on villagers in Salak Island.
- Almost 39% are overweight and obese despite low income level.
- Almost 1/3 of the participants have hypercholesterolemia.
- However percentage of participants with high blood pressure is low and blood glucose level of participants are normal.
- 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

## IFE Student locations of entomological survey





## Acknowledgement

### USF

Prof Donna Peterson, Dean of College of Public Health,  
 Prof Boo Kwa, Associate Dean for International Affairs CPH  
 Prof Tom Unnasch, Chair, Department of Global Health  
 Assistant Prof Dr Azliyati Azizan  
 Faculty, staff and students of Department of Global Health & IDRB, CPH, USF  
 Florida Department of Health  
 Hillborough County Mosquito Control Division

### UNIMAS

Vice Chancellor of UNIMAS  
 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)







Thank You







## 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