



## **2014 GLOBAL HEALTH WORKSHOP**

Hosted By National Taiwan University  
September 24-27, 2014

### **STUDENT POSTER CONTEST**



# Occurrence and Sources of Disinfection Byproducts (DBPs) Precursors in Watersheds



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## Introduction

The control of DBPs precursors in watershed is an efficient way for both DBP precursor removal and environmental protection. However, little is known about the DBPs characteristics in watershed, so as its DBPs formation potential. To facilitates the development of water quality control strategies, comprehensive information of upstream sources and its water quality should be clearly delineated.

**Objectives :** This study attempts to investigate the raw water quality of two Taiwanese watersheds and describe the characteristics of the two watersheds in terms of their land use and upstream plantation.

## Methods

DOC, TDN, UV254, and ammonium were analyzed to construct a watershed database. Furthermore, disinfection by product formation potential (DBPFP) were also be measured for the purpose of evaluating the maximum DBP concentrations in the source waters. Arc GIS was used to access the land use proportions in the watersheds and their correlations with the water quality.

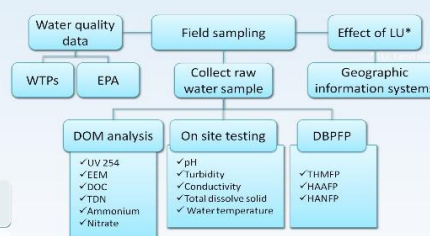


Fig. 1 Research frame work

## Results

### Kinmen Reservoirs

The drinking water supplying system in east Kinmen County is served by various reservoirs on the island. Two main DWTPs, 榮湖 TP and 太湖 TP, were supplied by 金沙、榮湖、蘭湖 and 田埔、太湖、金湖, respectively.



Table 1. Water quality parameter

Name of reservoir	pH	Turbidity (NTU)	Temperature (°C)	Conductivity (μS)	TDS (mg/L)
金沙	8.8 (0.6)	11.2 (3.8)	21.5 (6.9)	990.0 (591.4)	858.3 (483.3)
榮湖	9.1 (0.5)	18.6 (8.1)	22.3 (6.7)	783.5 (203.9)	671.8 (189.4)
蘭湖	8.5 (0.6)	15.5 (7.5)	21.0 (7.4)	359.7 (47.9)	321.2 (78.8)
田埔	9.1 (0.9)	19.9 (3.9)	21.1 (7.5)	398.0 (60.6)	342.5 (53.3)
太湖	8.9 (0.5)	17.9 (5.2)	20.7 (7.6)	392.3 (59.2)	341.5 (51.5)
金湖	9.1 (0.8)	7.4 (1.0)	20.0 (7.4)	2204.0 (799.7)	1973.7 (761.2)

The pH were greater than 7, probably resulting from eutrophication. The highest conductivity and TDS were found in 金湖 reservoir because of the invading sea water, followed by 金沙 and 榮湖, which may result from agricultural pollution (Table 1).

In Fig. 2, DOC showed a highest concentration in 田埔. The concentration of total dissolved nitrogen were relatively low than DOC, and the average concentration ranged between 0.6 and 1.8 mg/L NO<sub>3</sub>-N.

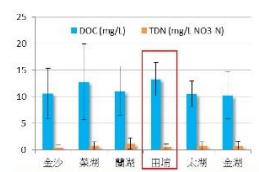


Fig. 2 Average DOC and TDN

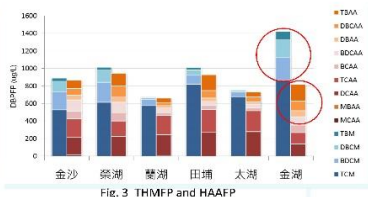


Fig. 3 THMFP and HAAP

Fig. 3 presented the results of THMFP in Kinmen six reservoirs. TCM was the dominating species in THMFP. 金湖 reservoir formed more Br-DBP than Cl-DBP, pointing out the invading of sea water had been a carrier of bromide-containing compounds.

Land use properties were divided into six categories. Referring to Fig. 4, 蘭湖 was mainly surrounded by forest, 榮湖 and 太湖 were forest and buildings.

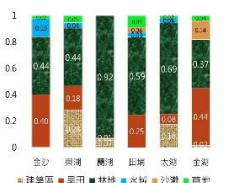


Fig. 4 Land use proportion

### Keelung Watershed

In Keelung watershed, five samples were collected from downstream to upstream. Site K02 and K04 represented tributaries of Keelung river main stream.



Table 2. Water quality parameter

Sampling site	pH	Turbidity (NTU)	Temperature (°C)	Conductivity (μS)	TDS (mg/L)
[K01] 八通山溪	8.0 (0.4)	7.5 (3.2)	25.4 (5.1)	236.3 (87.0)	181.1 (77.4)
[K02] 新港溪	7.9 (0.2)	9.3 (4.0)	24.5 (4.5)	158.7 (73.0)	125.3 (58.8)
[K03] 田子溪	8.1 (0.6)	4.9 (3.3)	24.7 (5.2)	199.8 (75.8)	158.4 (58.5)
[K04] 深澳溪	7.6 (0.2)	10.9 (13.3)	25.2 (5.1)	371.2 (110.7)	293.8 (87.4)
[K05] 介壽溪	8.2 (0.7)	5.4 (3.6)	25.8 (5.6)	192.4 (80.0)	152.4 (62.6)

In Table 2, conductivity and TDS were found the highest level in K04 (371.2 us, 293.8 mg/L), but the lowest in K02.

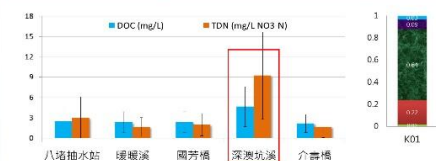


Fig. 5 Average DOC and TDN

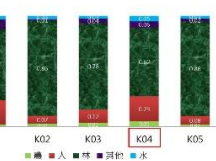


Fig. 6 Land use proportion

In Fig. 5, DOC ranged from 2.1 to 4.6 mg/L, with a highest concentration in K04. TDN was found the highest level in K04. According to Fig. 6, K04 had the highest percentage of anthropogenic land use and agricultural land use, hence affecting the water quality.

## Discussion and Future Work

- Sea water invasion cause 金湖 reservoir both the highest level of conductivity and total dissolved solid, which result in pausing use of raw water.
- Dissolved organic carbon levels were greater than those of TDN, leading to a considerable concentration of DBPFPs.
- According to DBPFP tests, we found 金湖 reservoir formed more Br-DBP. This finding supports the consequence of the sea invasion.
- After land use proportion calculation, agricultural land use and building area appeared to be the probable factors to contribute DOM level in Kinmen.
- In Keelung, K04 had the highest level of all water quality parameters, including conductivity, TDS, DOC and TDN, which may arise from the polluted water sources.
- Higher proportion of anthropogenic and agricultural land use were also discovered in K04, which may be an environmental factor to raw water quality.
- Comparing to Kinmen reservoirs, raw water in Keelung was found to be lower in DOC, but higher in TDN levels.
- The limitations of this study are inadequate quantity of sample size, not-to-date land use information.
- The future work of this study should be establishing the relationship between NOM properties as well as DBPFP and land use properties, comparing the water quality of the two watersheds are also required.

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Name: Alyssa Nelle D. Dacapias

Title: Mutagenicity of Raw and Used Olive Cooking Oil Using Reverse Mutation Technique



# Mutagenicity of Raw and Used Olive Cooking Oil Using Reverse Mutation Technique

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## ABSTRACT

A vast number of studies have investigated the different chemicals present in the food we eat that may be mutagens and may cause life-threatening diseases. Many researches also showed that mutagens can be formed as well upon cooking. Samples of raw and used olive cooking oil were evaluated in terms of their mutagenic property by means of the reverse mutation assay or the Ames test. All of the samples showed negative result which indicated no mutagenic activity and are safe to use. Previous studies have revealed that olive oil indicated strong antimutagenic and anticarcinogenic effects which can be attributed by the presence of Cytochrome P450, as well as the existence of phenolics and MUFAs (monounsaturated fatty acids). Furthermore, the non-significant increase in mutagenicity of used olive oil can be explained by the production of peroxides leading to reduction of its antioxidative and anticarcinogenic properties. It is concluded that frying the cooking oil once did not produce appreciable amount of mutagens. However, further researches on the mutagenicity of excessively reused different cooking oils are recommended.

## INTRODUCTION

Food, as a human necessity should be made available for a hygienic living. In order to have a better control over the nutritional content and the overall healthfulness of the foods we eat, we prepare and cook meals at home. In cooking, we use different ingredients that are taken up inside our body. However, they may contain several chemicals that may be carcinogens. Since large amounts of oils are used for cooking, too much reuse of oils for deep-fat frying is of special interest. Cooking oils that have been thermally oxidized are believed to be mutagenic and cause growth retardation, increased liver and kidney weights, and damage to the liver, thymus and testes. For these reasons, it is very important to be aware of the mutagens present in our food, which may be carcinogenic.

The aim of this study is to investigate the mutagenic activities of raw and used olive cooking oil by means of the reverse mutation technique or the Ames test.

## METHODOLOGY

Sample Selection



Treatment of  
Strains



UV mutant  
production



Reverse Mutation  
Assay

## RESULTS AND DISCUSSION

All the samples showed negative degree of mutagenicity. They were found at the safe level. There is a non-significant difference in the number of revertants present in raw and in used olive cooking oil (Table 1).

Table 1. Mutagenicity of Raw and Used Olive Cooking Oil

Samples		Number of Revertants	Degree of Mutagenicity
Negative Control (Sterile Water)	1	5	-
	2	4	-
	3	5	-
Raw Olive Cooking Oil	1	3	-
	2	5	-
	3	6	-
Used Olive Cook- ing Oil	1	4	-
	2	7	-
	3	8	-

### Mutagenicity of Olive Cooking Oil

The negative mutagenicity can be attributed by inclusion of the microsomes, which is indicative of its anticarcinogenicity. This is because of the presence of antioxidants and antimutagens, cytochrome P450 which enhances the anticarcinogenic effect (Rosenkranz, 2003).

### Effects of Cooking on Olive Oil

The findings on the oil samples exposed to heat by cooking indicated a slight and non-significant increase in the number of revertants. This result can be explained by the hydrolytic effect of temperature on long chain fatty acids leading to the production of peroxides and eventually a reduction in the antioxidative and anticarcinogenic properties of olive oil (Shams et al., 2012). The effect of temperature on the degradation of  $\alpha$ -tocopherol in free and dissolved forms has been described by Sabliov et al. (2009), where a destructive effect on MUFAs and antioxidants of olive oil was seen. It showed that temperatures higher than 180 °C significantly reduce the antioxidant defense potential (AOP), while elevating the MDA (malondialdehyde) levels causing peroxide formation (Sabliov et al., 2009).

## CONCLUSION

The study showed that the raw and the used oils did not generate any significant mutagenic load as the oils evaluated failed to induce a positive mutagenic response on the Ames test.

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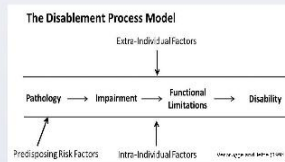
# Factors of the Disablement Process and Disability Trajectories among Older Adults in Taiwan: A Latent Class Growth Modeling Approach

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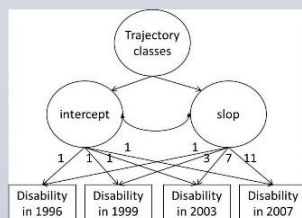
## BACKGROUND and OBJECTIVES

- Disability is a complex process interplayed with multiple factors. One of the dominant theoretic frameworks of disability, **the disablement process model** indicates that three sets of factors, named **predisposing, intra-individual, and extra-individual factors**, act in moderating the speed of progression toward disability.
- In studying of progression of disability, a new concept of **disability trajectory**, becomes popular as statistics improvement and provides abundant information regarding the functional changes with time.
- The objectives of this study are:
  - identify the distinct **subgroups of ADLs and IADLs disability trajectories** among older population in Taiwan.
  - examine whether the predisposing, intra-individual, and extra-individual **factors of the disablement process model** might predict Taiwanese older adults developing into different disability trajectories.



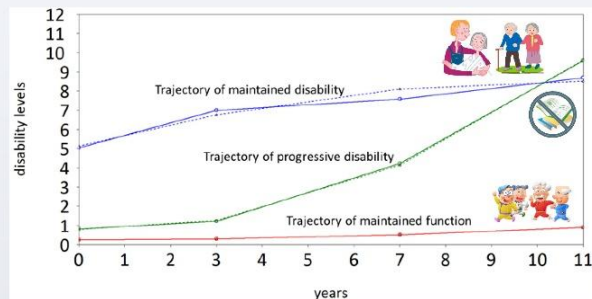
## Method

- Samples were from 4 waves of **Taiwan Longitudinal Study on Aging Survey** during 1996-2007 (n=3186).
- The main outcome variables, disability trajectories for activities of daily living (ADL) and instrumental activities of daily living (IADL) in each wave of survey, were identified by using **latent class growth curves modeling**.
- The other predicting variables at baseline included predisposing factors such as age, gender, educational levels, comorbidities and depressive symptoms; intra-individual factors such as health behaviors, social relations, and leisure time activities; extra-individual factors such as using assistive devices. The relationships between trajectories and factors of the disablement process model were examined by applying **hierarchical logistic regression**.



The conceptual framework of disability trajectories by using latent class growth curves modeling

## RESULTS Three Disability Trajectories among Older Adults in Taiwan



X-axis showed the survey time (years) and Y-axis showed the disability levels. The membership probabilities of three disability trajectories were:

### •Trajectory of Maintained Disability (3.95%)

- the characteristics of older adults in maintained disability trajectory were **in between** the other two trajectories in terms of the **age, the numbers of physiological and psychological illness**.
- people belonging to the trajectory of maintained disability were less engaging in leisure time activities and decreased their social network comparing with their counterparts, but they seemed to **use more of assistive devices** when started disabled.

### •Trajectory of Progressive Disability (11.27%)

- people in the progressive disability trajectory seemed to be the **oldest-old** and have the **highest number of comorbidities** than the rest people in other two trajectories.
- They were also noted to be **less educated and less use of assistive devices** comparing with the elderly in the maintained function and maintained disability trajectory, respectively.

### •Trajectory of Maintained Function (84.78%)

- older adults were more likely to be **younger**, with **less comorbidities, fewer depressive symptoms**, behaving **active leisure time activities**, but less satisfactory with social support than those in the progressive and maintained disability trajectories counterparts.

## Conclusion

Based on the systematically assessment in terms of the disablement process model, the findings suggested that **predisposing, intra-individual, extra-individual factors** played different roles in predicting older adults' disability trajectories.

We would like to thank to any comments for improving this study comprehensively. E-mail contact: d00848008@ntu.edu.tw





## Prediction of Mother-to-child Transmission of Hepatitis B Virus Infection by Using Perinatal Maternal Quantitative Surface Antigen

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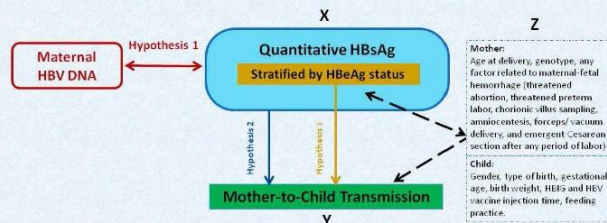
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College of Public Health  
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### Background

- To eliminate hepatitis B virus mother-to-child transmission, it is necessary to detect pregnant women with high HBV DNA and then give additional prevention strategy before delivery.
- Quantitative HBsAg is a newly developed method with a unit price much lower than that of HBV DNA.

### Aims

- To evaluate the correlation between serum quantitative HBsAg and HBV DNA.
- To predict mother-to-child transmission by using quantitative HBsAg.
- To assess the feasibility of replacing HBV DNA by quantitative HBsAg in high risk screening.



### Material and Methods

- This is a prospective cohort study conducted at the National Taiwan University Hospital, Cardinal Tien Hospital, and Tzu-Chi General Hospital Taipei Branch.
- All HBsAg positive mothers aged 18 to 45 years who had deliveries between April 2007 and June 2012 in these study hospitals were invited to participate in the study at postpartum wards.
- Serum HBsAg, HBeAg and HBV DNA level of these mothers were measured.
- Infants were followed up to 1-1.5 years old and had two separate serum HBsAg tests.
- Spearman's correlation coefficient was used to examine the correlation between quantitative HBsAg and HBV DNA. Logistic regression analyses were used to assess the predictive ability of HBV DNA, quantitative HBsAg, and other risk factors of mother-to-child transmission.

### Results

- Among the 461 children, 16 children were found to be infected with HBV. All of them were born to HBeAg positive mothers with high HBV DNA ( $7.9 \pm 0.74 \log_{10}$  IU/ml) and high quantitative HBsAg ( $4.7 \pm 0.2 \log_{10}$  IU/ml).
- Quantitative HBsAg had a significant positive correlation with HBV DNA level ( $r=0.64$ ,  $p<0.0001$ ) in all subjects and in HBeAg positive subjects group ( $r=0.62$ ,  $p<0.0001$ ). The optimum cut-off point for HBV DNA concentration of  $7 \log_{10}$  IU/ml was  $4.26 \log_{10}$  IU/ml, with a sensitivity of 93%, specificity of 97%.
- After adjusting possible confounders, quantitative HBsAg could significantly predict mother-to-child transmission.

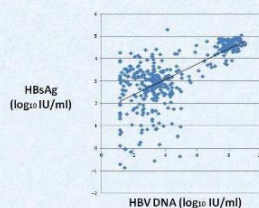


Figure S-1 Correlation between HBsAg and HBV DNA  
 $r=0.64$   $p<0.0001$

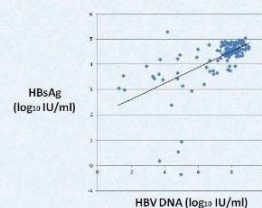


Figure S-2 Correlation between HBsAg and HBV DNA in HBeAg positive mothers  
 $r=0.62$   $p<0.0001$

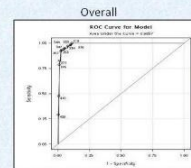


Figure S-4 The predictive value of quantitative HBsAg for high HBV DNA ( $\geq 7.0 \log_{10}$  IU/ml) in HBeAg positive pregnant women was assessed by an ROC curve  
Cut-off point: HBsAg:  $4.26 \log_{10}$  IU/ml  
Sensitivity: 93%; Specificity: 97%

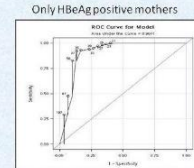


Figure S-5 The predictive value of quantitative HBsAg for high HBV DNA ( $\geq 7.0 \log_{10}$  IU/ml) in HBeAg positive pregnant women was assessed by an ROC curve  
Cut-off point: HBsAg:  $4.30 \log_{10}$  IU/ml  
Sensitivity: 92%; Specificity: 87%

Table S-2 Characteristics between children infected and children uninfected

Characteristics	Children infected (N=16)	Children uninfected (N=445)	P
Maternal age at delivery (yr), mean±SD (range)	33.1±3.9 (23.3-41.6)	33.70±4.3 (19.5-45.1)	0.56
HBsAg status			
Positive	16 (100%)	0 (0%)	-
Negative	0 (0%)	445 (100%)	-
HBV DNA ( $\log_{10}$ IU/ml) mean±SD (range)	$7.9 \pm 0.74 (6.0-9.0)$	$4.3 \pm 2.4 (1.2-9.0)$	<0.0001
HBV DNA ( $\log_{10}$ IU/ml)			
< 7.0	1 (6.3%)	273 (75.6%)	<0.0001
≥ 7.0	15 (93.7%)	88 (24.4%)	
HBsAg ( $\log_{10}$ IU/ml) mean±SD (range)	$4.7 \pm 0.2 (4.2-4.9)$	$3.0 \pm 1.3 (-2.5-3)$	<0.0001
HBsAg ( $\log_{10}$ IU/ml)			
Low	0 (0%)	153 (34.4%)	<0.0001
Mid	0 (0%)	154 (34.6%)	
High	16 (100%)	138 (31.0%)	
Maternal ALT			
≤ ULN (40 U/L)	14 (87.6%)	398 (91.3%)	0.66
1-2 × ULN	1 (6.2%)	27 (6.2%)	
2-5 × ULN	1 (6.2%)	11 (2.5%)	
HBV genotype			
B	12 (75%)	180 (73.5%)	0.88
C	4 (25%)	61 (24.9%)	
B+C	0 (0%)	4 (1.6%)	
Type of birth			
NSD	11 (68.8%)	180 (40.4%)	0.0361
C/S	5 (31.2%)	265 (59.6%)	
Any factor related to maternal-fetal hemorrhage†			
Yes	7 (43.8%)	238 (55.9%)	0.34
No	9 (56.2%)	188 (44.1%)	
Gestational age	37.9±2.2 (33.0-41.0)	38.7±1.3 (31.3-41.4)	0.16
Gender			
Male	9 (56.2%)	235 (52.8%)	0.79
Female	7 (43.8%)	210 (47.2%)	
Birth weight(kg)	3.0±0.5 (1.9-3.7)	3.1±0.4 (1.8-4.5)	0.32
Delayed injection of first dose of HBV vaccine			
No	15 (93.8%)	420 (95.2%)	0.55
Yes	1 (6.2%)	21 (4.8%)	
Vaccine (On schedule)			
Yes	13 (81.3%)	366 (85.5%)	0.72
No	3 (18.7%)	62 (14.5%)	
Feeding practice§			
Breast milk	8 (50%)	192 (44.0%)	0.29
Formula	4 (25%)	61 (14.0%)	
Both breast milk & formula	4 (25%)	183 (42.0%)	

Table S-3 Potential risk factors of HBV mother-to-child transmission -- Multivariate logistic regression

Variables	Model 1		Model 2	
	Odds ratio (95% CI)	P	Odds ratio (95% CI)	P
Maternal HBsAg (per $\log_{10}$ IU/ml increase)	17.62 (3.63-85.41)	0.0004	-	-
Maternal HBV DNA (per $\log_{10}$ IU/ml increase)	-	-	2.29 (1.44-3.63)	0.0004
Type of birth*	1.54 (0.46-5.21)	0.49	1.29 (0.40-4.18)	0.68
Gestational age (per 1 wk increase)	0.78 (0.54-1.12)	0.18	0.72 (0.50-1.04)	0.08
Delayed injection of first dose of HBV vaccine	0.33 (0.02-6.20)	0.46	0.37 (0.02-5.70)	0.48
Feeding practice*	1.11 (0.29-4.33)	0.88	0.83 (0.21-3.02)	0.78
Hosmer and Lemeshow test	-	0.9992	-	0.9606

\*Feeding practice during the first 6 months; Reference group: formula milk  
Abbreviations: CI, confidence interval

### Conclusions

- Our study documents that quantitative HBsAg is highly correlated with, and as predictive as HBV DNA for mother-to-child transmission.
- With the concern of the screening cost, quantitative HBsAg may be used as a new screening tool during pregnancy.



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Title: Evaluation of A Community-based Health Promotion Program for Older Adults -Take Communities in Nantou as An Example!

# Evaluation of A Community-based Health Promotion Program for Older Adults — Take Communities in Nantou as An Example

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## BACKGROUND AND OBJECTIVE

Successful aging is currently a goal for aging societies. Taiwan is moving toward an aged society. The risk of disability will increase as the population aging and may result in a heavy financial burden for Taiwanese government, society, and families. A health promotion program implemented by Nantou YMCA in Nantou county are based on the experiences of disability prevention programs from Osaka YMCA in Japan, which emphasized on developing the concept of fun, safe and effective disability prevention programs.

The program emphasizes on both physical and mental health for the elderly with the goal of enabling them to live independently, and hopefully to build a successful aging society.

This study investigated the effect of a community-based 10-week health promotion and disability prevention courses provided by Nantou YMCA regarding change of fitness, exercise self-efficacy expectation, exercise outcome expectation and quality of life among older people.

## METHODS

- Study design: quasi-experimental design
- Subjects: older adults participating in Nantou YMCA health promotion courses (intervention group, n = 42) and older adults from other Nantou communities (control group, n = 31)
- The 10-week, 2 hours a day health promotion and disability prevention courses provided by Nantou YMCA combined health education, physical training and group activity. Physical training focused on increasing lower-body strength, balance and flexibility.
- The study conducted pre-test and post-test to investigate the changes of two groups' fitness, exercise self-efficacy expectation, exercise outcome expectation and quality of life(SF-8) before and after the courses.
- Fitness test for older adults



- ① Static balance - One foot stand with eyes open (seconds)
- ② Dynamic balance/Agility - Time up and go test (seconds)
- ③ Flexibility in upper extremity - Back Scratch (cm)
- ④ Lower body strength- 30-second chair stand (number of full stands)

## RESULTS

- The average age of two groups is 74.43. Average number of diseases is more than 1 disease (hypertension, heart disease mainly). Female older adults accounts for 89%. Education level is mostly under primary school (86%). Half of older adults reported they did not fall within last year, and most of them have regular exercise habit (72.6%, walking mainly).
- The older adults participated Nantou YMCA health promotion courses showed significant improvement in three aspects of evaluation outcome than older adults in the control group.

- Changes of pre-test and post-test between two groups

Outcome variables	Control group (n = 31)	Intervention group (n = 42)	p-value
<b>Fitness</b>			
Time up and go (second)	0.93 ± 2.07	-0.69 ± 1.69	0.000***
30-second chair stand (N. of full stands)	1.06 ± 2.38	2.22 ± 2.47	0.050 (0.0496)*
<b>Quality of life</b>			
Role physical (RP)	0.26 ± 5.93	3.94 ± 7.11	0.019*
Bodily pain (BP)	-1.58 ± 4.92	1.92 ± 6.72	0.017*
General health (GH)	0.85 ± 6.43	4.26 ± 7.98	0.047*
Vitality (VT)	-1.34 ± 6.44	2.66 ± 8.15	0.027*
Sum of physical health (PCS)	-1.39 ± 5.89	2.55 ± 7.22	0.015*
<b>Exercise self-efficacy expectation</b>	0.20 ± 0.88	2.29 ± 1.53	0.000***

\*  $p < 0.05$  、 \*\*  $p < 0.01$  、 \*\*\*  $p < 0.001$

## CONCLUSION

This study indicated that the health promotion program implemented by Nantou YMCA, originated from Japan, after localizing for rural communities in Nantou county, were effective on helping community dwelling older adults to improve their physical function, physical and mental quality of life, and their confidence of exercise regularly, after revising the program to fit the culture in Nantou county.



We would like to thank to any comments for improving this study comprehensively. E-mail contact: christy2708@gmail.com



Name: Min-Hua Wu ; Shou-Jen Lan; Bing-Long Wang\*

Title: Physical Activity and Fruit-vegetable Consumption Improves the Quality of Life of the Elderly in Taiwan

## Physical Activity and Fruit-vegetable Consumption Improves the Quality of Life of the Elderly in Taiwan

Min-Hua Wu ; Shou-Jen Lan; Bing-Long Wang\*  
Department of Healthcare Administration, Asia University.



### Background

Many factors can impact the quality of life (QoL) of the elderly. Higher physical activity (PA) and higher fruit-vegetable (FV) consumption on the quality of life of older people are helpful. However, the combined effect is unknown.

**Objective :** This study aims to investigate the physical activity of FV consumption and improve the quality of life of the elderly in Taiwan results.

**Method :** In this study, the data source as "Taiwan Longitudinal Survey on Aging(TLSA) " in 1999 and 2007 databases. In 1999 over 4,440 cases of 53 years as an object, excluding death and unfinished respondents, a total of 1,525 data insufficiency in subsequent eight years. Real effective cases for the 2,915 QoL was assessed using the SWLS(Satisfaction with Life Scale) and was also adopted from LSIA(Life Satisfaction Index A). Use SPSS/Windows 21.0 software was followed by eight years of quality of life in elderly statistical analysis. The Regression models was controlled for baseline demographic, socioeconomic, health behavior, health and disease status variables.

**Results :** Low physical activity and low FV consumption frequency were used as control, physical activity and FV consumption frequencies are high, their quality of life, then eight years old 2.09 times increase in satisfaction (P = 0.002); High physical activity their quality of life increased by 2.44 times (P = 0.019); higher FV consumption were 2.26 times increase in satisfaction (P = 0.001); moderate physical activity or FV consumption 7-9 times weekly were satisfactory quality of life degree increased 1.8 times (P = 0.017).

**Conclusions :** The results of this study shows that higher physical activity combining with higher FV consumption, which can effectively improve the quality of life of the elderly in Taiwan. This result highlights of the importance which were higher physical activity and higher FV consumption, this health behavior is safe, effective and cost-effective, and can save the country medical expenses.

Table 1 Demographic Characteristics Analysis(N=2,915)

Variables	n (%)	Variables	n (%)
Gender		Cancer	
Male	1555 (53.3)	No	2896(99.3)
Female	1360 (46.7)	Yes	19(0.7)
Age		Physical Activity (METs)	
53-64	1286 (44.1)	Low <450	1648(56.4)
65-74	1104 (37.9)	Moderate 450-750	287(9.9)
≥ 75	525 (18.0)	High >750	980(33.7)
Formal education,years		FV Consumption(time/week)	
≤ 6	1979 (67.9)	<7	336(11.4)
7-12	527 (18.1)	7-9	343(11.6)
≥ 13	409 (14.0)	≥ 10	2236(77.1)
Living with a spouse		PA and FV Consumption	
Yes	2124 (72.9)	Both Low	232(8.0)
No	791 (27.1)	Both High	821(28.2)
Smoking history,years		Only PA High	72(2.5)
No	2246 (77.0)	Only FV High	1178(40.4)
Yes	669 (23)	Other	611(21.0)
Drinking			
No	2141 (73.4)		
Yes	774 (26.6)		
Hypertension			
No	2092(71.7)		
Yes	823(28.3)		
Heart Disease			
No	2476(84.9)		
Yes	439(15.1)		
Diabetes			
No	2603(89.3)		
Yes	312(10.7)		

Table 2 Relatives between variabes with QoL in 1999 and 2007(N=2915)

Variables	Number of QoL(n/N )	p	Variables	Number of QoL (n/N )	p
Gender			Diabetes		
Male	831/1555	.843	No	1396/2603	.208
Female	706/1360		Yes	495/312	
Age			Cancer		
53-64	738/1286	.318	No	1525/2896	1.000
65-74	566/1104		Yes	8/19	
≥ 75	233/525		Physical Activity (METs)		
Formal education,years			Low (<450)	812/1648	.356
≤ 6	1031/1979	.357	Moderate(450-750)	168/287	
7-12	302/527		High(>750)	552/980	
≥ 13	204/409		FV Consumption(time/week)		
Living with a spouse			<7	182/336	.041*
Yes	1139/2124	.067	7-9	176/343	
No	398/791		>10	1173/2236	
Smoking			PA and FV Consumption		
No	1184/2246	.682	Both Low	133/232	.007**
Yes	353/669		Both High	470/821	
Drinking			Only PA High	34/72	
No	1107/2141	.318	Only FV High	568/1178	
Yes	430/774		Other	322/611	
Hypertension					
No	1128/2092	.738			
Yes	408/823				
Heart Disease					
No	1314/2476	.047			
Yes	223/439				

\* p<0.05 \*\*p< 0.01

Table 3 Efection of PA and FV Consumption to QoL Satisfaction

Variables	% of total	% with satisfaction	OR (95% CI)	p value
Physical activity(METs)				
Low 0-450	56.5	27.8	1	
Moderate 450-750	9.8	5.7	0.76 (0.54-1.08)	0.135
High > 750	33.6	18.9	0.88 (0.67-1.54)	0.763
FV consumption frequency time/ week				
< 7 times	11.5	6.2	1	
7-9 times	11.7	6.0	1.41(0.91-2.18)	0.123
≥ 10 times	76.7	40.2	1.57(1.11-2.22)	0.011

\* p<0.05 \*\*p< 0.01 OR = odds ration; 95% CI = 95% confidence interval

Table 4 Efection of both PA and FV Consumption to QoL Satisfaction

Variables	% of total	% with satisfaction	OR (95% CI)	p value
Low PA and Low FV Consumption	79.5	4.5	1	
High PA and Low FV Consumption	2.4	1.1	2.44 (1.15-5.16)	0.019*
Others	20.9	11.3	1.80 (1.10-2.93)	0.017*
Low PA and High FV Consumption	40.4	19.4	2.26 (1.42-3.58)	0.001**
High PA and High FV Consumption	28.1	16.1	2.09 (1.31-3.35)	0.002**

\* p<0.05 \*\*p< 0.01 OR = odds ration; 95% CI = 95% confidence interval



Name: Chu Pei Chen

Title: The Relationships Between Regular Diet, Eating Behavior, Eating Preference And Emotion Among Youth

# The Relationships Between Regular Diet, Eating Behavior, Eating Preference And Emotion Among Youth

Chu Pei Chen (褚霈貞)<sup>a</sup>, Mei-Hsin Su<sup>a</sup>, Po-Hsiu Kuo<sup>a</sup>, Hao-Jan Yang

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## Information

An increasing prevalence of mental health problems has coincided with the change of modernity and associated with unhealthy behaviors over the past few decades (Houri et al., 2012).

From National Health Interview in Taiwan (HPA, 2009), it performed that the percentage of having irregular diet was 18.7% in breakfast, 9.54% in lunch and 17.9% in dinner in 12-17 year-old adolescents. Leann et al. (1997) firstly addressed the importance of the component of eating behaviors to imbalance diet, bad eating experiences and eating habits are also important to depression.

It is unclear how the unhealthy eating behaviors impact on mental health among youths in Taiwan. We aimed to firstly evaluate the prevalence of unhealthy eating behaviors among youths and investigate the associations among depression to eating behaviors and dietary preference. To check whether unhealthy eating behaviors, eating preference and irregular eating will result in negative emotion or not.

### Key words:

Irregular diet, eating behaviors, depression.

## Material and Methods

### Study subjects:

We recruited students of 5<sup>th</sup> and 7<sup>th</sup> grade students in five cities in Northern and Central Taiwan. (New Taipei City, Taipei City, Taichung city, Changhua city and Nantou city.). Schools were randomly selected in these cities. In total, 549 students were enrolled in the current study.

### Questionnaires:

**CES-D** The Center for Epidemiologic Studies Depression Scale

A screening test for depression, 20 items with 4-point rating scale  
In our study, cronbach's alpha= 0.89

Measure scale: (a) Less than 15 → non-depressed  
(b) 15-21 → Mild to Moderate (not included)  
(c) Over than 21 → depressed

**Eating condition** Origins from Bureau of Health Promotion

Including regular diet, eating preference, eating behavior (as below)

- ① Bad eating experience:  
normal meal replaced and kinds of appetite influenced
- ② Unhealthy eating habits:  
unbalanced diet, midnight snack, snack eating and drinking beverages

### Data analysis:

Polychoric correlation and chi-square were used to examine the associations between food preference, eating behaviors and depression. Then, we used multivariate logistic regression analysis to evaluate the effects of irregular diet and eating behavior (bad eating experiences, unhealthy eating habits) on depression in youth after adjusted for gender, age and district.

## Results

**Table1.** Demographic characteristics of students by genders

	Total, N=549 (N, %)	Boy, N=260 (N, %)	Girl, N=289 (N, %)
Grade			
5 <sup>th</sup> (10-11 years)	409 (74.5)	198 (48.4)	211 (51.6)
7 <sup>th</sup> (12-13 years)	140 (25.5)	62 (44.3)	78 (55.7)
District			
Northern	184 (34.9)	85 (46.2)	99 (53.8)
Central	365 (65.1)	175 (47.9)	190 (52.1)
CES-D <sup>1</sup>			
Non-depressed	379 (71.9)	178 (71.8)	201 (72.0)
Moderate	77 (14.6)	40 (16.1)	37 (13.3)
Depressed	71 (14.4)	30 (12.1)	41 (14.7)

Note: Moderate group would be excluded in later study.

**Table2.** The relationship between food preference, imbalanced diet and depression..

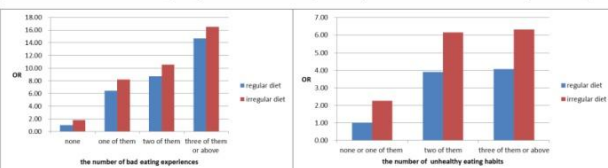
	Imbalanced diet		Depression		OR (95% CI)
	Polychoric correlation	P-value	Polychoric correlation	P-value	
Grains	-0.059	0.291	-0.031	0.363	-----
Vegetables	<b>-0.460</b>	<b>&lt;.0001</b>	<b>-0.169</b>	<b>0.018</b>	2.47 (0.98-6.19)
Fruits	-0.196	<b>0.035</b>	0.047	0.710	0.63 (0.07-5.31)
Dairy	-0.061	0.290	-0.018	0.422	2.13 (0.78-5.80)
Meat	0.128	0.888	0.046	0.710	1.30 (0.51-3.27)
Seafood	-0.030	0.390	-0.082	0.169	1.77 (0.76-4.11)
Nuts	-0.214	<b>0.016</b>	0.096	0.882	0.66 (0.32-1.38)

Note: The numbers of disliking Grains are too small to estimate.

This indicated that the imbalanced diet with vegetables disliking will increase the risk of depression.

**Table3.** The effect of numbers of eating behaviors to depression stratified by regular eating using multivariate logistic regression model

	Regular eating OR (95% CI)		irregular eating OR (95% CI)	
<b>Bad eating experiences (N)</b>				
None (398)	1.00		1.82	(1.0-3.30)
One of them (42)	6.41	(3.0-13.5)	8.23	(4.0-16.6)
Two of them (15)	8.72	(2.8-27.7)	10.5	(3.8-31.0)
Three of them or above (8)	14.7	(3.3-65.6)	16.5	(4.3-68.9)
<b>Unhealthy eating habits (N)</b>				
None or One of them (155)	1.00		2.26	(1.3-4.00)
Two of them (121)	3.90	(1.7-9.0)	6.16	(3.0-13.1)
Three of them or above (135)	4.07	(1.8-9.1)	6.33	(3.1-13.2)



Note: Adjusted for grade, gender and district.. All of the analysis are significant.

Higher numbers of unhealthy behaviors increased the risk of depression; combining with irregular diet further strengthened the risk.

## Conclusion

The more imbalanced diet (such as the less preference of vegetables), the more chance of developing depression. We found that regular diet and healthy eating behaviors play an important role in reducing the risk of depression in youth. In the future, with more detailed data collection regarding the frequency of eating behaviors, even accompanying with food frequency questionnaire and 24 hours food recall, the relationship between eating behaviors, food preference and depression can be better elucidated.



Name: Chia-Wen Hsiao ; Bing-Long Wang\*

Title: Combined Effect of Fruit-vegetable Consumption and Physical Activity on the Risk of Cognitive Decline in Older Taiwanese

2<sup>nd</sup>

## Combined Effect of Fruit-vegetable Consumption and Physical Activity on the Risk of Cognitive Decline in Older Taiwanese



Kuei-Hua Chang ; Bing-Long Wang\*  
Department of Healthcare Administration, Asia University.

**Background :** The rapidly aging global population, cognition has become a subject of importance to the elderly. Many factors can impact the onset of cognitive decline. Higher fruits-vegetables and higher physical activity consumption are considered effective in reducing the risk. However, the combined effect is unknown.

**Objective:** The objective of this study was to determine the combined effect of higher fruit-vegetable consumption and physical activity on subsequent risk of cognitive decline in older Taiwanese.

**Method :** This study conducted the datasets of the "Taiwan Longitudinal Survey on Aging (TLSA) from 1999 to 2007". Subjects were 4,440 in 1999. Excluding those who had cognitive decline, cancer, incomplete data and no survivors. Practical and effective cases were 1,138. Logistic regression was used to evaluate the combined-effect of fruit-vegetable consumption and physical activity to reduce the risk of having cognitive decline under control demographic, socioeconomic, health behavior, disease and other variables after eight years (with 2007 SPMSQ total reduction of 2 per cent is defined as a recession) longitudinal effect.

**Results :** Compared to those who had low fruit-vegetable consumption and low physical activity, the risk of having cognitive decline was reduced to 69% (OR=0.31, 95%CI=0.16-0.58, P<0.001) for those who had high fruit-vegetable consumption and high physical activity. All other conditions were not significant.

**Conclusion :** The intake of fruits and vegetables and physical activity on cognitive decline experienced negative significant effects, while consuming a much higher intake of fruits and vegetables and reduce risk of cognitive decline in the elderly, therefore encourage people always to combine increase intake of fruits and vegetables and physical activity in order to reduce the risk of cognitive function decline.

Table 1 Demographic Characteristics Analysis (N=1,138)

Variables	n (%)	Variables	n (%)
Gender		Stroke	
Male	606(53.3)	No	1111(97.9)
Female	532(46.7)	Yes	27( 2.4)
Age		Physical Activity	
<64	332 (28.3)	No(0)	324(28.5)
65-74	356 (31.3)	Moderate (1-11)	157(13.8)
≥ 75	460(40.4)	High ≥12	657(57.7)
Formal education (years)		FV Consumption(time/week)	
≤ 6	900 (79.1)	Low ≤7	139(12.2)
7-12	179 (15.7)	Medium 7-9	130(11.4)
≥ 13	59 (5.2)	High ≥10	869(76.4)
Living with a spouse		PA and FV Consumption	
Yes	779 (68.5)	Both Low	58( 5.1)
No	359 (31.5)	Both High	542(47.6)
Smoking history		FV High PA Low	211(18.5)
No	886 (77.9)	FV Low PA High	62( 5.4)
Yes	252(22.1)	Other	265(23.3)
Drinking			
No	833 (73.2)		
Yes	305(26.8)		
Hypertension			
No	717(63.0)		
Yes	421(37.0)		
Heart Disease			
No	903(79.3)		
Yes	235(20.7)		
Diabetes			
No	1008(88.6)		
Yes	130(11.4)		

Table 2 Relatives between variables with risk of cognitive decline in 1999 and 2007(N=1,138)

Variables	Number of cognitive decline n/N (%)	p value	Variables	Number of cognitive decline n/N (%)	p value
Gender		.515	Diabetes		.003*
Male	95/606( 15.7)		No	153/1008(15.2)	
Female	91/532(17.10)		Yes	35/ 130(25.4)	
Age		.990	Stroke		.828
<64	52/322(16.1)		No	182/1111(16.4)	
65-74	58/356(16.3)		Yes	4/ 27(14.8)	
≥ 75	76/460(16.5)		Physical Activity (time/week)		.001**
Formal education(years)		.049*	No 0	69/324(21.3)	
≤ 6	158/900(17.6)		Moderate 1-11	33/157(21.0)	
7-12	24/179(13.4)		High ≥12	84/657(12.8)	
≥ 13	4/ 59 ( 6.8)		FV Consumption(time/week)		.002**
Living with a spouse		.051	Low ≤7	35/159(25.2)	
Yes	116/779(14.9)		Medium 7-9	27/130(20.8)	
No	70/359(19.5)		High >10	124/869(14.3)	
Smoking		.353	PA and FV Consumption		.000**
No	140/886(15.8)		Both Low	18/58(31.0)	
Yes	46/252(18.3)		Both High	63/542(11.6)	
Drinking		.032*	FV High PA Low	39/211(18.5)	
No	148/833(17.8)		FV Low PA High	10/62(16.1)	
Yes	38/305(12.5)		Other	56/265(21.1)	
Hypertension		.716			
No	115/717(16.0)				
Yes	71/421(16.9)				
Heart Disease		.935			
No	148/903(16.4)				
Yes	38/235(16.2)				

\* p<0.05 \*\*p< 0.01

Table 3 Effecton of PA and FV Consumption to risk of cognitive decline

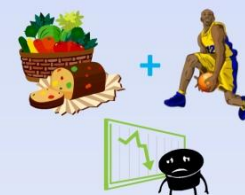
Variables	% of total	% with deterioration	2007 year OR (95% CI)	p value
Physical activity(time/week)				
No 0	28.5	21.3	--	--
Moderate 1-11	13.8	21.0	1.01 (0.63-1.63)	0.966
High ≥12	57.7	12.8	0.60 (0.42-0.87)	0.006*
FV consumption frequency(time/ week)				
< 7 times	12.2	25.2	--	--
7-9 times	11.4	20.8	0.76(0.42-1.37)	0.359
≥ 10 times	76.4	14.3	0.57(0.36-0.89)	0.013*

\* p<0.05 \*\*p< 0.01 OR = odds ration; 95% CI = 95% confidence interval

Table 4 Effecton of both PA and FV Consumption to risk of cognitive decline

Variables	% of total	% with deterioration	2007 year OR (95% CI)	p value
Both Low	5.1	31.0		
Both High	47.6	11.6	0.31 (0.16-0.58)	0.000*
High FV Consumption and Low PA	18.5	18.5	0.54 (0.27-1.05)	0.069
Low FV Consumption and High PA	16.1	16.1	0.44 (0.18-1.07)	0.068
Others	21.1	21.1	0.60 (0.32-1.14)	0.121

\* p<0.05 \*\*p< 0.01 OR = odds ration; 95% CI = 95% confidence interval





## Length of First Admission for Schizophrenia in Taiwan: National Trend from 1998 to 2007 and Its Correlates

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3. Department of Public Health, College of Public Health, National Taiwan University, Taipei, Taiwan
4. Institute of Health Policy and Management, College of Public Health, National Taiwan University, Taipei, Taiwan

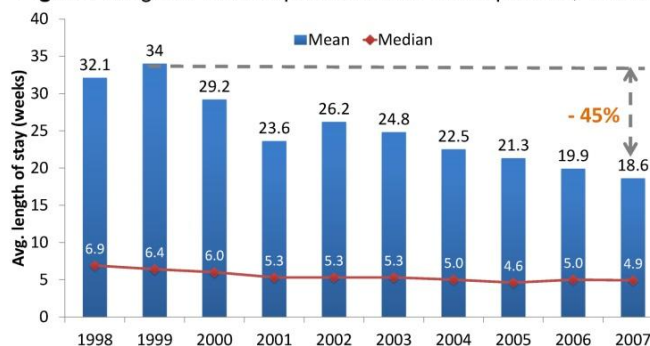
**Aim:** The study aims at providing a global view of first-admitted schizophrenia patients in Taiwan from 1998 to 2007.

**Methods:** Within the National Health Insurance Psychiatric Inpatient Medical Claim Database, a total of 55,172 subjects who had received a principal inpatient diagnosis of schizophrenia (ICD-9-CM code 295.x) for the first time between 1998 and 2007 is identified. Lengths of first hospitalization are calculated and analyzed with a multilevel regression model adjusting for hospital, physician, patient and treatment-level characteristics to explore whether a significant time trend exists.

**Results:** The averaged length of first hospitalization decreases by 45% from its highest point in 1999. After adjusting for hospital, physician and patient-level characteristics, admission at a later year is significantly associated with shorter length of hospitalization. Other factors associated with longer length of first hospitalization include being male, older age, lower insurance amounts (connoting lower household income), absence of substance use disorders or mood disorders, admission at district or psychiatric hospitals and receiving first-generation antipsychotic (FGA) during admission. These associations remain robust in the subgroup analysis.

**Conclusion:** From 1998 to 2007, lengths of first hospitalization for schizophrenia decreased significantly in Taiwan, but were still much longer than in Western countries. A great variety of hospital-, patient- and treatment-related factors influence lengths of first hospitalization.

**Figure:** Length of first hospitalization for schizophrenia, 1998-2007



**Table:** Factors associated with longer length of first hospitalization for schizophrenia

	All subjects			Subjects with 1-12 weeks of first hospitalization		
Demographic factors	AOR	95% CI	p	AOR	95% CI	p
Sex						
Male vs. female	1.16	1.11 – 1.21	***	1.07	1.01 – 1.13	*
Age (per 1 year increase)	1.02	1.02 – 1.02	***	1.01	1.01 – 1.01	***
Calendar year (per 1 year increase)	0.81	0.80 – 0.82	***	0.94	0.93 – 0.95	***
Insurance amount						
Fixed amount	2.19	1.86 – 2.58	***	1.92	1.55 – 2.38	***
<20000 NTD	2.52	2.15 – 2.96	***	2.10	1.70 – 2.60	***
20000-39999 NTD	1.58	1.33 – 1.87	***	1.50	1.20 – 1.88	***
≥40000 NTD	1.00	–		1.00	–	
Psychiatric comorbidity						
Mental retardation or PDD (+) vs. (-)	1.28	1.15 – 1.42	***	1.04	0.90 – 1.21	
Substance use disorders (+) vs. (-)	0.66	0.58 – 0.74	***	0.68	0.59 – 0.80	***
Mood disorders (+) vs. (-)	0.87	0.80 – 0.94	**	0.89	0.80 – 0.996	*
Treatment						
FGA/SGA	3.21	3.06 – 3.37	***	2.21	2.06 – 2.36	***
Clozapine	2.13	1.85 – 2.45	***	1.63	1.34 – 1.99	***
Non-clozapine SGA	1.43	1.35 – 1.52	***	1.14	1.05 – 1.23	***
FGA	1.00	–		1.00	–	
Hospital type						
Medical centers	1.00	–		1.00	–	
Regional hospitals	1.24	1.00 – 1.53		1.24	1.01 – 1.52	*
District hospitals	1.37	1.07 – 1.76	*	1.39	1.10 – 1.77	**
Psychiatric hospitals	1.85	1.42 – 2.41	***	1.51	1.20 – 1.91	**
Seniority of psychiatrists						
≥ 10 years	4.08	3.69 – 4.51	***	0.96	0.88 – 1.05	
5-9 years	1.82	1.70 – 1.94	***	0.97	0.90 – 1.04	
0-4 years	1.00	–		1.00	–	

\* p<0.05 \*\* p<0.01 \*\*\* p<0.001

AOR: adjusted odds ratio; CI: confidence interval; FGA: first-generation antipsychotic; NTD: National Taiwan Dollars; PDD: pervasive developmental disorders; SGA: second-generation antipsychotic



## Youth Perspective to Health under the NCD Crisis in Palau

Ayumi Kunimasa, Osaka University Faculty of Human Sciences (bnl52690@gmail.com)

### Background1: The life modernization and people's health in Palau

- Although Palauan people kept their own traditional life style until 1885, they have been colonized by Spain, Germany and Japan for next 60 years. After the WW2, U.S. have progressed **their rapid modernization** through a large amount of capital imports from western countries and infrastructural constructions by Japan and Taiwan ODA (Mita, 2010).
- The main causes that bring the obesity to Palau society are **the westernization of food intake under the control of U.S.** (The food efficiency rate in Palau is less than 10%), **the decreasing amount of exercise because of the spread of automobiles** (There is no any public transportations in Palau) and **the pursuing cooking efficiency** owing to the movement of women into the society (GLOCOL, 2011).
- As a result, **the cause of death for 65% of people under 70 years old is NCD** such as diabetes, cancer and stroke (WHO, 2010).



↑ Chocolates for souvenir in VEGGIES corner at biggest super market



↑ Rotten vegetables at biggest super market



↑ The main road is crowded by car

### Background2: Youth Health in Palau

- The crisis of NCD and obesity effects on youth, and according to the recent school health screening implemented in all of schools in Palau by Ministry of Health, **24.6% are categorized to obesity (BMI ≥ 25)**. This number is higher compared to U.S.(16.9%) which is the country famous for obesity (MOH, 2013).
- These are derived from **the lack of exercise** as the evidence "only 1 time 45 min PE lesson per 1 week" and "school bus transportation service" shown, and **the school lunch with a few vegetables**.
- Although Palau has 27 primary and secondary schools, they **do not have a kind of school infirmary**. This is why 1 school nurse go around 5 public schools (1 day for 1 school) over 1 week in the Koror and Airai states.
- Other corresponding to NCD and obesity in the school is **PE and health lessons, the banning of snacks and juices and large school gardens and sports matching after school**.



[UP] A school lunch with few vegetables

[Down] Weight management by school nurse →

### Research outline

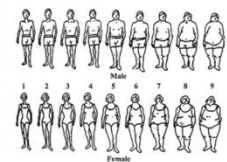
- The issues of previous researches :**
  - Nevertheless the greater part of researches have remarked the adult NCD and health issues, few studies have not focused on **the ones of youth in Palau because of low exigency**.
  - Nevertheless the greater part of researches have remarked the objective measures, few studies have not focused on **peoples internal perspective to health** that strongly effect on their health management and promotion .  
→ Moreover, considering this is important **for enhancing the effectiveness of public policy and health building-program and education** (Yoshida, 2013).
- The purpose of research:** to identify **the factors that determine youth perspective to health**.
- Date:** 13~21 Jan 2013
- Method:** Questionnaire, Semi-structured interview, Participants observation
- Site:** Koror and Babeldaob islands (**Nearly 80% of total population** are concentrated in these two islands.)
- Object:** 59 students (※**Age: 8 - 15 years old, Sex: Boy : Girl = 34:25**)  
A school 5 grade 40 ppl, B school 6 grade 14 ppl, C school 8 grade 5 ppl  
(※A, B are located **in urban**, and C is located **in suburb** in the map.)



### Result1: The recognition of body image

- Question:** By using a **body scale**, participants are asked about the number most similar to **their current body shape**, and which number is **their ideal body shape** in their future.

Current Body Shape	Ideal Body Shape in the future			Summary
	Hope to be lose weight or maintain current shape in their future	Hope to remain their body shape in the future	Hope to gain more weight in their future	
1	0	0	4	4
2	0	0	4	4
3	0	2	14	16
4	6	3	3	12
5	9	1	3	13
6	8	0	0	8
8	1	0	0	1
Summary (Boy: Girl)	14 (10): 8 (6)	2 (2): 0 (0)	18 (15): 8 (6)	58



- Result:** The students who hope to gain more weight in their future (28 students) and the students who hope to be lose weight or maintain their current body shape (31 students) are almost **the same ratio**. (Blue cell and Red cell in the above figure).
- Discussion:** Considering the current situation, the number of students hoping to gain more weight in the future is greater than expected.

### Result2: The relationship between food preference and body image

- Question:** Creating 3 groups (A, B, C) and each group consisted of **4 different kinds of food items such as meat/fish, imported vegetable/can and local vegetable**. Ask students to choose 1 item from each group and the reason why you choose it.

		Selected Items (decreasing order)			
		1	2	3	4
Group A	S	4. Mix Vegetable Can (40.7%)	1. Fruit Bat (25.8%)	3. Tofu (20.3%)	2. Beans (13.2%)
	R	3	3	9	7
	F	4	3	9	7
	I	4	3	9	7
Group B	S	4. Spam (37.3%)	3. Pork (30.5%)	2. Tomato (20.3%)	Spanish (10.2%)
	R	6	4	12	4
	F	6	4	12	4
	I	6	4	12	4
Group C	S	1. Seafood (49.2%)	3. Cabbage (27.3%)	4. Tuna Can (13.6%)	2. Egg Plant (10.2%)
	R	14	3	7	2
	F	14	3	7	2
	I	14	3	7	2



- Result:** • Mixed vegetable, Spam and seafood are popular (Orange cell in the figure)  
• Many students selected vegetable and meat/fish **in well-balance**, and combined various kinds of reasons why they selected such as "Taste is good" and "Good to Health".  
• In 4 items out of 12, "the students who hope to be skinny and maintain the current body scale in their future" and "the students who hope to gain weight in their future" are the same ratio. (Red and Blue in the figure)
- Discussion:** • The reason why students choose imported items and seafood as their most favorite items is **because these items are easy to obtain compared to other items**.  
• There is **no relativity between their food preference and their ideal body image in the future**. (Ex: The students, who hope to be skinnier, choose vegetable.)

### Result3: Students concern to their/ their family and friends health

- Question:** ① Open-ended questions about **students concern to their/ their family and friends health**, ② participation observation and conducted interviews to students who were introduced by teachers

- Result:** • **86.4% of students mentioned about family**, and their concern is family's tobacco (n=21), drinking (n=20), overweight and underweight (n=18) and high blood pressure (n=4). Moreover some of students answered **they try to correct the family's bad health habits**.

- Regarding to themselves, rich data was corrected by personal interview.  
• "I really likes to play baseball **but I had palpitations and shortness of breath** while I was playing basketball **because I was overweight**. I consulted to my physical issues to PE teacher and he coordinated my own training program. After half a month, I succeeded in shaping up by following the PE teachers advice and was able to play basketball very well." - T (A School, Boy, 9 years old)



- "We started wishing to be skinnier after seeing the girl models in American fashion magazine. When we consulted to school counselor, the counselor told us about plans to go to a fitness gym several times per week. She started to accompany us counselor and began shaping up from several weeks ago." - S and T (B School, Girl, 12 years old)

- Discussion:** • The reason why a lot of students are concerned about smoking is because currently half of Palauan adults are addicted to chewing smoke, and **younger generations do not like this custom because it makes their teeth unclean**.

- The reason why students are motivated to keep their health good is **to enhance their performance ability or to be attractive outward looking rather than preventing or improving NCD disease**. The role of the teacher and school health is **to introduce them to healthy lives**.

### Conclusion and Recommendation

- Through the questionnaire as to the student's health concerns, **it was shown that they understand "The things positive and negative for health" in terms of meal, exercise, sleep, drinking, tobacco**. Also, **a number of students try to their/ their family and friends health management based on their knowledge**.
- However, as for the obesity, their health management do not seems to intend the NCD prevention in their future because there are **a number of students who hope to gain more weight in their future and no relativity between their food preference and their ideal body image in their future**.
- It is highly recommendable that **teachers and school health work on the student's motivation that "How they would like to do/ be" in case of health education** not only the emphasis of health management for disease control.

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# Comparison of Healthcare Utilization Among Residents in Different Nursing Home Ownerships— Using Taiwan National Health Insurance Database

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## BACKGROUND

- Taiwan faced a dramatic demographic change in current years, such as increasing aged population and expected grows number of disabled people. To take care of those older and severer disabled people, institutional care need to be carefully assessed. Nursing home is one of the subtypes of institutional care services in Taiwan and it is common eligible for people who need continued nursing skill and personal care. Thus, in order to reach a higher qualified care of nursing home in Taiwan, comprehensive quality assessments should be conducted and reported.
- Quality assessments in healthcare systems included three important components, such as **structure, process, and outcome**. However, the Taiwan's Nursing Home Accreditation only included the structure and process domains and lack of the outcome assessment. To evaluate the outcome domain in quality assessment in nursing home, healthcare utilization such as ambulatory care, hospitalization, and emergency department used seem to be common indicators. In addition, previous studied noted that several factors might associate with the evaluation of residents healthcare utilization in nursing home, such as ownership and hospital-based settings. However, the **quality assessment and related factors affecting healthcare utilization in nursing home in Taiwan remained unclear**.
- The objectives of this study are:
  - Using national healthcare utilization data (Taiwan National Insurance Claim data) to bridge the knowledge gap between **healthcare utilization and quality assessment** of nursing home in Taiwan
  - Conducting a pilot scheme of outcome measurements in evaluating qualified nursing home in Taiwan.

## METHOD

- Data collected from national insurance claim dataset.
- We examined those subjects who lived in nursing home at least 6 months during 2006-2011 (n=579) and traced their 1-year healthcare utilization when staying in nursing home.
- The main outcome variables included **ambulatory, emergency department utilization and hospitalization** of those eligible subjects. The tested variables were nursing home ownerships (public or legal foundation, and private) and hospital-based setting or not.
- We used regression analysis to test the association between healthcare utilization and nursing home ownerships among residents in Taiwan.

## RESULTS

- People who lived in private nursing home were associated with :
  - Lower risk of emergency department admission (OR = 0.52,  $p < 0.0001$ ), lower risk of hospitalization (OR = 0.45,  $p < 0.0001$ ),

Table 1 : Residents and Nursing Home Ownership Associations with Risk of Emergency Department Admission and Risk of Hospitalization

	Risk of Emergency Department Admission				Risk of Hospitalization			
	Coefficient	p	OR	95%C.I.	Coefficient	p	OR	95%C.I.
Intercept	-1.0921	0.0652	--	--	-0.3784	0.5399	--	--
Sex								
Male	0.1780	0.3068	1.20	0.849 1.681	0.3249	0.0719	1.38	0.972 1.971
Age	0.0119	0.0499*	1.01	1 1.024	0.0113	0.0635	1.01	0.999 1.024
Nursing Home Region								
City	0.0082	0.9664	1.01	0.689 1.474	-0.1929	0.3371	0.83	0.556 1.223
Charlson Comorbidity index	0.1549	0.0046**	1.17	1.049 1.3	0.1953	0.0008***	1.22	1.085 1.363
Nursing Home Ownership								
Hospital-based	0.0306	0.8681	1.03	0.718 1.48	0.2467	0.1919	1.28	0.883 1.854
Nursing home Properties								
Legal Foundation	0.0195	0.9532	1.02	0.531 1.958	-0.6303	0.0947	0.53	0.254 1.115
Private	-0.6622	0.0224*	0.52	0.292 0.911	-0.7902	0.0189*	0.45	0.235 0.878
n=579	Wald $\chi^2=27.58$ $p < 0.0001$				Wald $\chi^2=31.05$ $p < 0.0001$			

\* $p < 0.05$  · \*\* $p < 0.01$  · \*\*\* $p < 0.001$

- Lower frequency of hospital admission, shorter length of stay in hospital and fewer hospital admission expenditure in a year.

Table 2 : Residents and Nursing Home Ownership Associations with Times of hospital admission, Length of Stay in Hospital and Hospital Admission Expenditure

	Frequency of hospital admission			Length of Stay in Hospital			Hospital Admission Expenditure		
	Coef	SE	p	Coef	SE	p	Coef	SE	p
Intercept	1.3392	0.51	0.0092	8.9314	7.51	0.2348	38647.00	47399.00	0.4152
Sex									
Male	0.4855	0.15	0.0015**	6.3234	2.23	0.0048**	43175.00	14086.00	0.0023**
Age	0.0058	0.01	0.2670	0.1615	0.08	0.0353*	1096.35	483.11	0.0236*
Nursing Home Region									
City	-0.5503	0.17	0.0013**	-4.7086	2.49	0.0589	-9772.21	15700.00	0.5339
Charlson Comorbidity index	0.1616	0.05	0.0007***	1.9022	0.70	0.0066**	9114.52	4404.40	0.039*
Hospital-based Setting									
Hospital-based	0.0640	0.16	0.6930	-0.5060	2.37	0.8313	-16869.00	14987.00	0.2608
Nursing home Ownership									
Legal Foundation	-0.5768	0.29	0.0468*	-7.6943	4.24	0.0703	-52918.00	26779.00	0.0486*
Private	-0.7857	0.25	0.0021**	-10.1830	3.71	0.0062**	-73469.00	23415.00	0.0018**
n=579	F=6.22 $P < 0.0001$			Adj F=3.13 $P=0.0028$			Adj F=4.17 $P=0.0002$		
	R <sup>2</sup> =0.0595			R <sup>2</sup> =0.0436			R <sup>2</sup> =0.0486		

\* $p < 0.05$  · \*\* $p < 0.01$  · \*\*\* $p < 0.001$

## CONCLUSION

- The ownerships of nursing home were associated with different healthcare utilization in residents.
- Hospital or non-hospital-based characteristics of nursing home showed non-significant in healthcare utilization.
- The higher emergency department utilization and hospitalization was found in residents who lived in public or legal foundational nursing homes, comparing with those lived in private nursing home.
- ✓ The possible explanation might be that the **bigger scale** of nursing home such as public or legal foundational one, the more managing, caring problems and higher Acute care utilization would occur .
- ✓ **Downsizing of nursing home's scale** is a good strategy which promoting quality of care in long-term care services.

We would like to thank to any comments for improving this study comprehensively.  
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# The Effects of Simplified Tai Chi Exercise on Health-Related Quality of Life, Physical Function and Social Support for Residents in Congregate Housing

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## Background and Objectives

- The beneficial effects of Tai Chi on elder adults have been well-documented; however, most of the studies focused on community-dwelling or healthier elders. There is limited evidence suggesting a Tai Chi exercise that can promote health for congregate housing residents.
- The objectives of the study were:
  - To examine the effects of Tai Chi exercise on the health-related quality of life, physical function and social support among residents who lived in congregate housing.
  - To examine the mediated effect of social support between Tai Chi exercise and physical function and health-related quality of life.

## Methods

- The present study applied quasi-experimental design. A convenience sample of 50 residents from two separated congregate housing in northern Taiwan was recruited.
  - Experimental group(n=25): a Tai Chi exercise program
  - Control group(n=25): did not receive any intervention
- Tai Chi exercise program taught the Yang style of Tai Chi with 13 movement forms. It was implemented two times a week, 90 min per session for 18-week, and taught by a national-certified Tai Chi master.
- The outcome measure include health-related quality of life, physical function, and social support. Face to face interview questionnaire had been given to both groups at baseline, 18-week (intervention termination), respectively.
- Multiple regression analysis was conducted to exam the effects of Tai Chi exercise on residents' health-related quality of life, physical function, and social support. We further tested the mediated effect of social support between Tai Chi exercise and physical function and health-related quality of life by 3 series regression equations.



## Results

- Program completion rate
  - A total of 14 residents of experimental group (56%) completed the Tai Chi exercise program and 24 residents of the control group (96%) remained in this study.

Change of pre-test and post-test between two groups

	experimental group (n=14)	control group (n=24)	t	p
	Mean ± SD	Mean ± SD		

### health-related

#### quality of life

	experimental group (n=14)	control group (n=24)	t	p
General Health	3.86 ± 6.90	-1.79 ± 8.59	2.09	.043*

#### Physical function

	experimental group (n=14)	control group (n=24)	t	p
Total	1.36 ± 2.95	-1.17 ± 3.06	2.48	.018*

	experimental group (n=14)	control group (n=24)	t	p
Chair-stand time	0.86 ± 1.51	-0.71 ± 1.00	3.85	<.001***

\*p < .05 \*\*p < .01 \*\*\*p < .001

### Health-related quality of life

- In experimental group, physical component score and five domain, including role limitation of physical problem (RP), bodily pain (BP), general health (GH), vitality (VT), and social functioning (SF), were improved more than control group.
- After controlling for other variables, Tai Chi exercise had significant impact on the increase of general health score ( $\beta = 7.73, p < .01$ ).

### Physical function

- In experimental group, total score and three items score increased, including standing static balance, 6 meters timed walk, chair-stand time, and picking up a penny from the floor, while total score and four items decreased in control group.
- After controlling for other variables, Tai Chi exercise had significant impact on the increase of total score ( $\beta = 2.20, p < .05$ ) and chair-stand time score ( $\beta = 1.15, p < .01$ ).

### Social support

- In experimental group, social network and instrumental support were improved more than control group.
- After controlling for age and spouse, Tai Chi exercise had significant impact on the increase of instrumental support ( $\beta = 0.93, p < .05$ ).

## Conclusion

- Tai Chi exercise is a beneficial program for those older residents living in congregate housing residents to maintain their general health and physical function.



Name: Hera Zasvir D. Alhambra

Title: Differentiating between Leptospirosis & Dengue In The Asian Setting Using A Meta-Analysis Approach



# Differentiating Between LEPTOSPIROSIS AND DENGUE In The Asian Setting Using A META-ANALYSIS APPROACH

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## INTRODUCTION

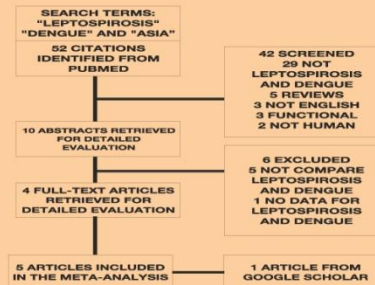
Early clinical signs and symptoms of leptospirosis are non-specific and often indistinguishable from other common causes of acute febrile illnesses in the tropics- e.g. dengue, malaria, scrub typhus and typhoid (LaRocque et al., 2005; Zaki, 1998). Several studies have shown that leptospirosis is often confused with dengue and underdiagnosed in endemic regions (LaRocque et al., 2005; Levett, Branch, & Edwards, 2000; Sanders et al., 1999). Thus the ability to distinguish acute leptospirosis from dengue is important in determining the appropriate treatment.

## MATERIALS AND METHODS

### SELECTION OF ARTICLES

Inclusion criteria are: (i) research design that directly compares leptospirosis with dengue, and (ii) provision of comparative raw data for these two diseases.

Figure 1 Summary of literature search



## STATISTICAL ANALYSIS

The number of subjects with leptospirosis was compared to those who were infected with dengue. This relationship was expressed as odds ratio (OR), 95% confidence interval (CI). An OR of >1 indicated greater association with leptospirosis more than dengue fever, implying correct identification of leptospirosis. On the other hand, an OR of <1 implies misdiagnosis of leptospirosis as dengue. Pooled ORs were generated from independent data on clinical signs and symptoms of both diseases.

Table 2  
Summary Effects That Differentiate  
Leptospirosis From Dengue

	N	OR	95% CI	P value	Phet	i <sup>2</sup> (%)	Mode
Overall	6	0.25	0.08-0.85	0.03	<0.00001	96	R
Subgroup Analysis							
India	3	1.05	0.68-1.62	0.82	0.64	0	F
Independent data							
Males	4	1.10	0.74-1.63	0.64	0.90	0	F
Conjunctival symptoms §	3	2.03	1.38-2.98	0.0003	0.19	40	F
Jaundice/ Icterus	5	2.34	0.77-7.17	0.14	0.0004	80	R
Bleeding/ Hemorrhage	4	1.15	0.56-2.34	0.71	0.13	47	F
Abdominal Pain	4	1.47	0.62-3.46	0.38	0.005	77	R
Rash	4	0.42	0.28-0.62	<0.001	0.15	44	F
Hepato- splenomegaly	6	0.65	0.30-1.45	0.29	0.007	73	R
Headache	4	0.84	0.39-1.82	0.66	0.03	68	R
Vomiting	6	0.84	0.60-1.19	0.34	0.89	0	F

N: number of studies; OR: odds ratio; CI: confidence interval; Phet: P value for heterogeneity; § conjunctival suffusion and sub-conjunctival hemorrhage; R: random-effects model; F: Fixed-effects model.


## RESULTS

The overall odds ratio (OR 0.25,  $p=0.03$ ) significantly favored dengue over leptospirosis. This association was altered to favor leptospirosis in the Indian subgroup (OR 1.05,  $p=0.82$ ) and among males (OR 1.10,  $p=0.64$ ). Of the eight clinical symptoms, three (hepatosplenomegaly, headache and vomiting), too general to be attributed to leptospirosis, favored dengue (OR 0.65-0.84,  $p=0.29-0.66$ ). The significant association of rash with dengue (OR 0.42,  $p<0.001$ ) implies that its use could lead to misdiagnosis of leptospirosis. Three symptoms (jaundice, hemorrhage and abdominal pain) were probably specific enough to favor leptospirosis (OR 1.15-2.34,  $p=0.14-0.71$ ). However, it was the significant association (OR 2.03,  $p=0.0003$ ) of conjunctival symptoms with leptospirosis that makes it a strong parameter in discriminating between the two diseases.

In summary, the overall finding implies misdiagnosing of leptospirosis, but geography may factor in its correct diagnosis as well as the risk factor of being male. However, conjunctival symptom seems to strongly confer reliability in correctly identifying leptospirosis. More studies with better sample sizes as well as study design are needed to improve discrimination between the two infectious diseases.




Name: Erlinda Castro-Palaganas, Ruel Caricativo and Marian C. Sanchez  
 Title: "Source" country perspectives on the migration of highly trained Health personnel: Causes, Consequences and Responses



uOttawa  
L'Université d'Ottawa  
Canada's university

# Philippines: Key Informant Interviews

"Source" Country Perspectives on the Migration of Highly Trained Health Personnel: Causes, Consequences and Responses  
 Erlinda Castro-Palaganas, PhD, Marian C. Sanchez and Ruel Caricativo



hfi  
Health Force Institute Incorporated

## KEY ISSUES

**Social Determinants of Migration**

**I. Philippine health care system**

- A. Inadequate delivery of health care services
  - 1. Equity problems in health service access: rich-poor and urban-rural divide
  - 2. Imbalance in the HRH skill mix resulting to adequacy, quality, and equity problems in health care delivery
- B. Inadequate/Inappropriate budgetary allocation for health
  - 1. Neoliberal government policies
  - 2. Privatization
- D. Lack of efficient implementation and monitoring of regulatory frameworks
- E. Government's neglect of people's health rights

**II. Philippine Human Resources for Health**

- A. Socio-cultural problems
  - 1. "Medical-oriented practice"
  - 2. Hierarchy and discrimination
- B. Security concerns
  - 1. Militarization of rural areas
  - 2. Political vilification of health workers' advocacy groups
- C. Economic predicaments
  - 1. Low salary
  - 2. Low return of investment
- D. Personal dilemma
  - 1. Job dissatisfaction
  - 2. Additional work stress

**III. Migration scenario**

- A. Local policies
  - 1. Labor export policy
  - 2. Bilateral and international labor agreements
- B. International policies
  - 1. Neoliberal globalization
- C. Migration impacts
  - 1. Weakening of the health care system
  - 2. Commercialization of the health education system
  - 3. Social costs of migration
  - 4. Internal migration (rural to urban)
- D. International issues
  - 1. De-skilling and renouncement of professional dignity
  - 2. Threats of potential social injustices, e.g. sexual harassment, trafficking, discrimination, and maltreatment, among others.

## METHODOLOGICAL APPROACH

**Qualitative Research: Constructivist Approach; Critical Social Perspective**

**I. Sampling Strategy:**  
 Interviewed individuals knowledgeable of human resources for health (doctors, nurses, midwives, Physical/OccupationalTherapists) matters as they concern their organizations and the country. (32 KIs; plus 3 Group Interviews; 2 FGDs)

KIs represent a range of stakeholder interests from:

- national government agency officials (e.g., dealing with immigration, health, human resources)
- representatives from health regulatory bodies (Professional Regulation Commission)
- health professional associations and advocacy groups
- private sector employees
- public health facilities/employers
- teaching institutions
- recruitment agencies

Sampling: purposive; convenience sampling within the purposively determined categories.

Tool: semi-structured interview guide

**II. Data analysis strategy**

Interviews were transcribed and translated following approved ethical procedures. Data collected were analyzed simultaneously via systematic, documented procedures of thematic and constant comparative analysis using Nvivo and manual procedures.

Iterative and collective process of condensing the data gathered; identifying what pattern best summarizes the multifaceted description of the context, policy environment and experiences of the migration of health care professionals in the each of the cases.

A preliminary coding scheme was developed by the core research team and Philippine team beginning with descriptive codes, then organized into higher-level interpretive codes, categories or themes.

- The entire process is value laden, and we attempt to make explicit our value commitments and our disagreements where they arise.
- We are committed to transparency and reflexivity.
- We recognize that others may interpret our research differently.

## RESULTS

**I. Views on migration**

- A. Migration as Development Paradigm
- B. Costs and implications of migration
  - 1. Impacts to the health care system
  - 2. Internal migration
- C. Migration as a "normal" phenomenon
- D. HRH Retention and Factors for Non-migration
  - 1. Job Satisfaction
  - 2. Ideals to serve the people

**II. Trends in Migration**

- A. Est. 10 million migrant workers, including HRH
- B. Urban-rural imbalance in distribution of HRH in the country

**III. Consequences of Migration**

- A. Positive
  - 1. Remittances
  - 2. Career development
- B. Negative
  - 1. De-skilling, maltreatment and exploitation
- C. Brain drain

**IV. Managing Migration**

- A. Bilateral agreements: "brain circulation" instead of "brain drain"
- B. Tracking of health professionals
- C. Improving the educational system
  - 1. Curricula benchmarked against international standards
  - 2. Calls for "transformative education" with focus on needs of the country and a sense of service

**V. Challenges**

- A. Better socio-cultural, political, and economic situation in the country
- B. Better career opportunities and higher wages for HRH
- C. Personal advancement

**VI. Gaps**

- A. Studies concerning the health conditions of HRH overseas
- B. Government levy on migrant workers

## KEY TAKE AWAYS

**I. The discourse of 'ethical' recruitment: What is "ethical" about ethical recruitment?**

Improve living and working conditions in both source and recipient countries.

**II. Social Determinants of Migration: Managing migration in a holistic perspective.**

Migration is a social phenomenon.  
 Migration as an informed "choice", not a necessity

**III. Beyond Economic lens: Rights-based approach to migration**

- A. International human rights instruments
- B. Migration and development
  - 1. Role of human rights in the migration process
- C. Rights-based approach
  - 1. Founded on:
    - (a) freedom of movement,
    - (b) labor rights, and in the case of HRH,
    - (c) right to health of source country

**IV. Moving away from stop-gap measures: Upholding people's rights and welfare.**

**RESEARCH TEAM**

<p><b>Canada</b></p> <p><b>Co-Principal Investigators</b></p> <p>Ivy Bourgeault, PhD          Ronald Labonte, PhD          Gail Tomblin Murphy, RN, PhD</p> <p><b>Research Associates:</b></p> <p>Rene Andrew Bucz, MD          Marian C. Sanchez</p>	<p><b>Philippines</b></p> <p>Erlinda Castro-Palaganas, PhD, RN (coLead)          Denise Spitzer, PhD (coLead)</p> <p><b>Members:</b></p> <p>Jaime Galvez Tan, MD, MPH          Kenneth Ronquillo, MD, MPH</p> <p><b>Research Assistants:</b></p> <p>Jorwin Evangelista, RN Gary Paghilian, RN          Kenneth Cajigal, RN Ruel Caricativo          Jairah Alto, RN</p>
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Canadian Institutes of Health Research / Institut de recherche en santé

**ACKNOWLEDGEMENTS:**  
 This work was carried out with support from the Canadian Institutes of Health Research (CIHR), Grant No. 106693, and does not necessarily reflect the opinions CIHR.



Name: Elias F. Onyoh & Hsien-Ho Lin

Title: Disease burden across Africa and APRU member states: – the shape of the population well-being



## Disease burden across Africa and APRU member states: – the shape of the population well-being

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**Background:** Africa is vast and the second largest continent in terms of population and landmass on planet earth after Asia, however, it has been the poorest and the last in health and development in the world despite its enormous natural and human resources. The well-being of any population remains the one and most important aspects of life that is supposed to be pursued by every government; but this is not the case in most African countries. We aimed to evaluate the burden of disease, risk factors and injuries across some selected African nations and Asia Pacific Rim Universities (APRU) member states in 1990 and 2010 by making use of the available data from the Global Burden of Diseases, Injuries and Risk Factors Study (GBD) 2010.

**Methods:** We randomly selected 20 nations from the 5 United Nations African sub-regions - Eastern Africa, Middle Africa, Northern Africa, Southern Africa and Western Africa. We evaluated the population health across these African countries with that of the 16 APRU member states (Australia, Canada, Chile, China, Taiwan, Indonesia, Japan, South Korea, Malaysia, Mexico, New Zealand, Philippines, Russia, Singapore, Thailand and USA). Within each group and both groups combined, we measured the causes of death, disability adjusted life years (DALYs), years of life lost due to disability (YLDs), years of life lost as a result of premature death (YLLs), age-standardized death rate (ASDR) and health-adjusted life expectancy (HALE) at birth.

**Results:** Globally in 1990, lower respiratory infections (LRIs) were the topmost cause of death and ischemic heart disease (IHD) was the 5<sup>th</sup> but twenty years later, the picture was different with IHD at the top. In 2010, IHD was amongst the first 3 causes of death in 13/16 APRU member states (81.3%) and 3/20 African states (15%); and IHD contributed the highest proportion of DALYS globally (5.2%) with 2.0% contributed by APRU member states. In 2010, overall 3 leading risk factors in APRU member states were dietary risks, high blood pressure and smoking while that in the African states were high blood pressure, dietary risks and household air pollution. The top 5 causes of YLDs in APRU countries were low back pain, major depressive disorder, neck pain, other musculoskeletal and anxiety disorders while that in the African nations were low back pain, major depressive disorder, iron-deficiency anaemia, COPD and HIV/AIDS. In 2010, Japan ranked 1<sup>st</sup> in HALE (73.1), 1<sup>st</sup> in ASD and 2<sup>nd</sup> in age-standardized YLDs within APRU community while Libya ranked 1<sup>st</sup> in HALE (62.9), 1<sup>st</sup> in ASD and 3<sup>rd</sup> in age-standardized YLDs among comparator nations. Overall, the Central African Republic ranked 36<sup>th</sup> in HALE (39.5).

**Conclusions:** Non-communicable diseases (NCDs) and injuries are generally on the increase, while communicable, maternal, neonatal, and nutritional causes of DALYs are generally on the decline, with African nations already on the road towards the state of population well-being as seen in APRU member states. However, appropriate and effective strategies (including training of more global health professionals) are needed to mitigate the rising trends of NCDs in these nations.

**Keywords:** APRU, Africa, Ischemic heart disease, DALYs, HALE

### Acknowledgements:

a) National Taiwan University (NTU)

b) Organizers of the APRU Global Health Workshop 2014



## THE INFLUENCE OF AIR POLLUTION ON CIRCULATORY AND RESPIRATORY SYSTEM DISEASE MORTALITY AMONG RESIDENTS IN ULAANBAATAR CITY, MONGOLIA

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### INTRODUCTION

Air quality is a significant environmental problem in urban areas of Mongolia, particularly in Ulaanbaatar. The Global Burden of Disease study 2010 revealed that the main risk factors that accounted for the most disease burden in Mongolia and the result pointed out, leading risk factors for children under 5 and adults aged 15–49 years were indoor air pollution from solid fuels and alcohol use, respectively (IHME, 2010).

A hypothesis has been postulated which residents live in *ger* area may receive higher exposure to air pollution and they are likely to suffer greater health effects from air pollution than non-*ger* area. To address this specific hypothesis, an analysis of the association between  $SO_2$ ,  $NO_2$ ,  $NO_x$  and  $PM_{10}$  and mortality was conducted in 2011, and age-adjusted mortality rate (AAMR) and standardized mortality ratio (SMR) of respiratory and cardiovascular diseases of the residents in two different areas in Ulaanbaatar were estimated over the period of 2008–2011.

### MATERIAL AND METHODS

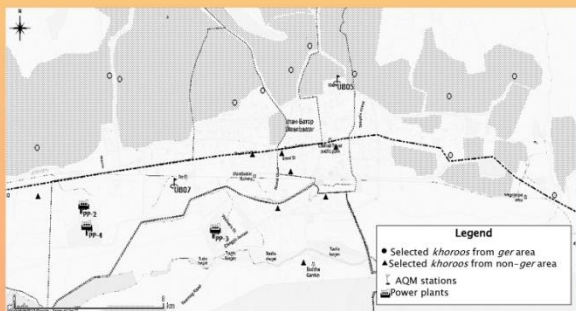


Fig.1. Selected air quality monitoring stations and *khoroos* in Ulaanbaatar city

We selected the six central districts of the city, the most city population resides (Fig. 1). UB05 and UB07 sites, on the basis of monitoring objectives and categorized into two areas to represent ambient community exposure in the city and excluded those with data available from less than 90% of intended records. 24-hour average concentrations of the  $SO_2$ ,  $NO_x$ ,  $NO_2$ , and  $PM_{10}$  were presented in Table 1.

Table 1. Summary statistics of air pollution concentrations of the *ger* and non-*ger* areas in Ulaanbaatar, in 2010–2012

Variables (unit)	<i>Ger</i>			Non- <i>ger</i>		
	N	Mean	SD <sup>b</sup>	N	Mean	SD
<b>Neighborhood measurements<sup>a</sup></b>						
$SO_2$ (mg/m <sup>3</sup> )	43	65.19	53.34	26	38.16	34.16
$NO_2$ (mg/m <sup>3</sup> )	45	41.95	25.53	29	39.67	20.56
<b>Ambient air quality<sup>a</sup></b>						
$SO_2$ (mg/m <sup>3</sup> )	364	50.54	61.12	364	22.09	26.32
$NO_x$ (mg/m <sup>3</sup> )	364	87.55	100.10	364	35.80	38.31
$NO_2$ (mg/m <sup>3</sup> )	364	41.88	30.17	364	26.72	21.88
$PM_{10}$ (mg/m <sup>3</sup> )	364	294.27	427.93	364	171.35	233.29

<sup>a</sup>Ogawa sampling concentrations in 2011–2012, air quality monitoring site measurement, July 01, 2010–June 30, 2011; <sup>b</sup>Standard Deviation

<sup>c</sup>Significantly different between *ger* and non-*ger* areas, \* $p < 0.05$ , \*\* $p < 0.0001$

The database for 2008–2011 was coded according to the International Classification of Diseases, Revision 10 (ICD 10) and we were used mortality caused by respiratory (ICD 10, J00–J06, acute upper respiratory infections, J09–J18, influenza and pneumonia, and J40–J47, chronic lower respiratory diseases) and circulatory (ICD 10, I10–I15, hypertensive diseases, I20–I25, ischemic heart diseases, I26–I28, pulmonary heart disease and diseases of pulmonary circulation, I30–I52, other forms of heart disease, and I60–I69, cerebrovascular diseases) system diseases to investigate the relationship between air pollution and adverse health effect among these two cohorts.

### RESULTS

Table 2. Gender specific standardized mortality ratios of circulatory and respiratory system diseases (ICD10) of the *ger* and non-*ger* area of Ulaanbaatar city during 2008–2011

Gender	Year	Ger area					Non-ger area				
		O	E	SMR	95% CI		O	E	SMR	95% CI	
					LL	UL				LL	UL
<b><i>Circulatory system diseases (I10–I28, I30–I52, and I60–I69)</i></b>											
Male	2008	175	102	170.96	146.57	198.28	90	58	155.64	125.15	191.36
	2009	189	114	165.10	142.40	190.41	117	73	161.13	133.26	193.15
	2010	203	144	141.19	122.43	162.02	127	92	138.53	115.48	164.85
	2011	188	149	125.94	108.58	145.30	183	100	182.58	157.08	211.06
	2008–2011	755	509	148.31	137.92	159.28	435	321	135.47	123.04	148.82
Female	2008	158	96	164.78	140.09	192.60	99	63	157.51	128.01	191.82
	2009	160	104	153.71	130.82	179.49	98	67	145.88	118.42	177.82
	2010	165	110	149.41	127.49	174.06	93	73	126.63	102.20	155.18
	2011	154	109	141.47	120.00	165.68	102	78	130.01	106.00	157.86
	2008–2011	637	420	151.80	140.24	164.06	392	283	138.51	125.14	152.93
<b><i>Respiratory system diseases (J00–J06, J09–J18, and J40–J47)</i></b>											
Male	2008	34	14	243.61	168.60	340.74	15	7	223.84	124.89	370.09
	2009	24	17	141.07	90.28	210.20	11	9	128.81	63.93	231.27
	2010	39	18	219.54	156.04	300.35	19	9	203.80	122.46	318.85
	2011	27	17	160.84	105.89	234.30	14	10	143.93	78.41	242.12
	2008–2011	124	65	189.40	157.53	225.87	59	34	171.76	130.73	221.67
Female	2008	18	9	192.60	113.90	305.00	9	5	173.58	78.70	330.92
	2009	29	13	221.42	148.17	318.36	13	7	190.58	101.06	326.83
	2010	30	12	246.09	165.91	351.69	15	6	231.21	129.01	382.28
	2011	21	12	181.52	112.19	277.93	10	7	150.47	71.66	277.78
	2008–2011	98	46	212.18	172.25	258.65	47	25	186.47	136.97	248.12

Table 3. Correlation analysis of the respiratory system diseases crude mortality rates and air pollution concentrations in 2011

		Non- <i>ger</i> area	<i>Ger</i> area	$NO_x$	$NO_2$	$SO_2$	$PM_{10}$
Non- <i>ger</i> area	Pearson Correlation	1	0.803**	0.787**	0.851**	0.695*	0.565
	Sig. (2-tailed)		0.002	0.002	0.000	0.012	0.055
<i>Ger</i> area	Pearson Correlation		1	0.816**	0.841**	0.819**	0.777**
	Sig. (2-tailed)			0.001	0.000	0.001	0.003
$NO_x$	Pearson Correlation			1	0.850**	0.965**	0.902**
	Sig. (2-tailed)				0.000	0.000	0.000
$NO_2$	Pearson Correlation				1	0.826**	0.739**
	Sig. (2-tailed)					0.001	0.006
$SO_2$	Pearson Correlation					1	0.958**
	Sig. (2-tailed)						0.000
$PM_{10}$	Pearson Correlation						1
	Sig. (2-tailed)						

\*\*Correlation is significant at the 0.01 level (2-tailed).

\*Correlation is significant at the 0.05 level (2-tailed).

### STUDY LIMITATIONS

Socio-economic indicators such as living condition, poverty, food intake, health service usage, etc., other pollutants and meteorological variables, such as temperature should be consider.

### CONCLUSIONS

This study concludes that air quality is getting worse and health impact of air pollution is occurring in Mongolia. As population, traffic, industrialization and energy use continues increasing in Mongolia, where harsh climatic conditions make it even more vulnerable to air pollution, we expect health risks of air pollution will be increased in the future in a world threatened by climate change. In the urban environment such as Ulaanbaatar city which has high density of population in *ger* and other dwelling areas, air pollution becomes a serious public health concern and there is a need of improvement for air pollution monitoring and evaluation system.

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Escuela  
de Medicina y  
Ciencias de la Salud.  
TECNOLÓGICO DE MONTERREY



## IFOM: A STEP CLOSER TO A WORLD CLASS EDUCATION.

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### INTRODUCTION

Today in the 21st century, we live in a dynamic, interconnected world, where challenges grow at an accelerating pace where national borders are routinely crossed. The need for additional methods to identify medical students' suitability and potential for success in medicine in this highly competed world is gaining importance. This demands higher standards and more aggressive ways of assessing our students' progress, aiming in the creation of globally competent graduates that will later improve healthcare in our country and around the world.

In Mexico the only national evaluating system for higher education is CENEVAL (Centro Nacional de Evaluación Para Educación Superior), an autonomous organization that is independent of any educational institution. It evaluates the student's knowledge once they have completed their undergraduate studies, establishing whether they are capable of using what they have learned during their training to confront and successfully resolve health related problems and situations that are typically

encountered in our country. The fact is "in our country" is not enough in this decade. One of our goals as institution is to forge individuals with all the necessary tools to adapt to the breathtaking pace of constant change, giving then the opportunity to succeed anywhere they go. This scenario cannot help but create new and higher goals to organize and measure the skills of our current and future students with the correct assessments in order to detect the areas of opportunity where we are lagging.

Being aware of our weaknesses is crucial; it gives us the opportunity to face and strengthen them, leading us a step closer to our goal: to build competitive beings that are capable of facing the international world challenges.

The results of this assessment are not only useful for the school's international benchmarking but also as an internal diagnostic process, for the individuals who are seeking self-assessment against international standards, those who are willing to participate in exchange programs, apply for post-graduate training programs and professional positions, or as a practice for other exams like the USMLE.

With this new way of assessing our medical students, our Institution has a better picture of how prepared our students are compared to the rest of the world, giving us the opportunity to identify our strengths, weaknesses

### PROBLEM STATEMENT

Mexico has a health education system that lags behind other countries, being the lack of resources and assessment tools one of the main causes. We do not intend to stay behind; this reality makes our School of Medicine Ignacio Santos at Tecnológico de Monterrey (EMIS) take matters into satisfying this need by starting to apply the Clinical Science Examination (CSE) and the Basic Science Examination (BSE) to our fifth and sixth year medical students respectively, measuring their core knowledge expected internationally at those critical points of their undergraduate medical education.

### METHODOLOGY

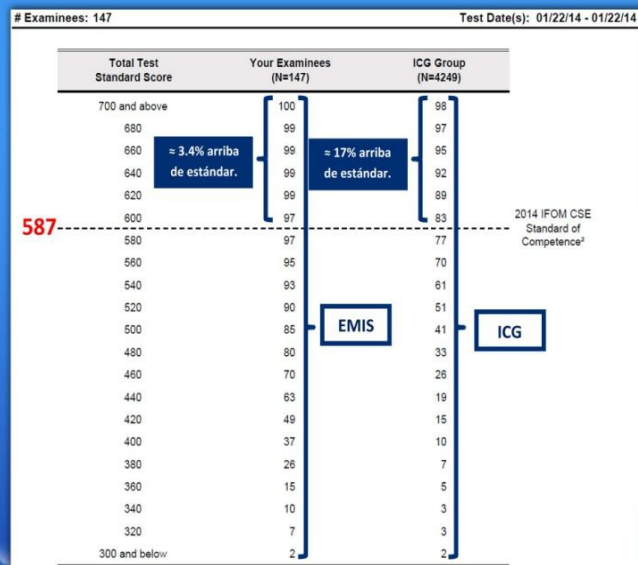
The IFOM was applied in web format, in English language to all 147 last year students of School of Medicine at Tecnológico de Monterrey in January 2014, consisting of 160 multiple-choice questions covering Family Medicine, Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry and Surgery, each with one best answer accepted as correct with a possible total range score of 200 to 800 standard points. Examinees had a time limit of 4 hours to complete the exam.

### RESULTS

Mean IFOM CSE score was 425.7, 25th percentile 420 and 75th percentile 469. The maximum score was 682 and the minimum 233.

Of the 147 students that took the IFOM CS, only 3.4% scored above the current recommended International Standard of Competence (RISC), 587 standard score points, which is based on the projected minimum passing score for the United States Licensing Examination® (USMLE®) Step 2 CK. Compared to the International Comparison Group (ICG), we are 13.6% behind in the total number of students that meet the RISC. 96.6% of the EMIS cohort did not meet the USMLE Step 2 CK minimum score. Correlation between IFOM scores and EMIS Cumulative GPA was  $r = 0.49$  and with TOEFL (Test of English as a Foreign Language)  $r = 0.45$ .

The areas in which the most points were obtained: Preventive Medicine & Health Maintenance and Musculoskeletal, Skin & Connective Tissue Diseases. The areas where the range of improvement is greatest is in Nutritional & Digestive Disorders and Gynecologic & Obstetric Disorders.



### CONCLUSION

International benchmarking is feasible and provides a variety of useful opportunities to grow and develop our student's potential, exploring and working in the areas of opportunity.

Part of the initial strategy to improve our student's scores in this type of assessments is to improve their English language and comprehension skills.

The challenge is to exceed 17% of the international reference group: At least 20% above the standard of competence.





# The Portrait of Filipina with Postnatal Depression: Effects of Aerobic Exercise and Parenting Education

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## INTRODUCTION

**TRENDS** Increasing **Pregnancy rate** in the Philippines (Tulali, 2010)  
**PROBLEM** Pregnancy **Complications** and **Postnatal Depression** (PND) (K. Iyengar & S.D. Iyengar, 2004)  
**ISSUE** Predictors of PND among Filipina mothers? Effect of aerobic exercise on PND?  
**SOLUTION** The objective of the study is to evaluate the **effect of parenting education and aerobic exercise** on Filipino mothers with postnatal depression.

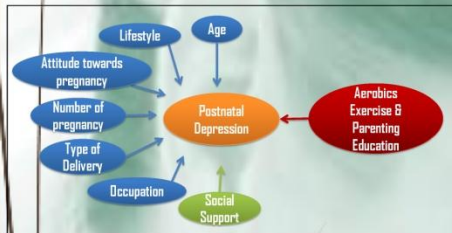


Figure 1. Research Simulacrum

**Transactional Analysis of Human Performance** between Person, Task & Environment Factors (Holmes, Rogers & Stone, 2010)

- The demographic characteristics of the subjects in this study reflect the typical Filipina mothers (age, breast feeding duration, and type of delivery), Filipino culture (more positive attitude toward pregnancy, strong social support, lesser level of stress and PND), and shifting paradigms (number of parity and working mother).
- The younger the mother, the higher risk of having postnatal depression.
- Mothers with age less than 30 tend to have greater chances of having postnatal depression mostly due to financial instability and poor social support (Hiltunen, 2003; Huntington, Banzon & Recidoro, 2011; Ross, n.d.).

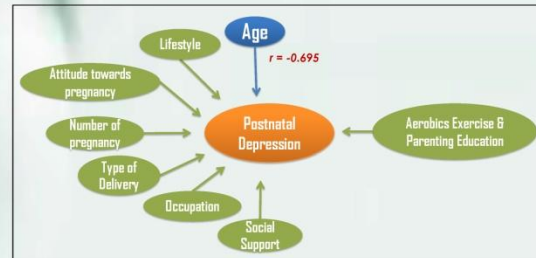


Figure 2. Predictors of Postnatal Depression

## METHODOLOGY

**Quantitative – Follow up Quasi – Experimental; Correlational Research Design Sampling**

- Purposive, Non-Probability Sampling
- Antipolo City & Angono, Rizal
- n = 14 (Epi-Info™7)
- Based on incidence rate of 10 – 13% (Thurgood, Avery & Williamson, 2009; Dennis, 2005) at 95% CI/ 10% Attrition Rate

**Outcome Measure**

- Primary OM: **Edinburgh Postnatal Depression Scale** (Cox, Holden & Sagovsky, 1987)
- Secondary: Family APGAR, Visual Analog Scale (VAS), Perceived Stress Scale, Borg Perceived Rate of Exertion (RPE)

**Statistical Analysis**

- Descriptive Statistics** – Demographic Characteristics
- Correlational Statistics** – Multiple Linear Regression Analysis
- Correlation between PTE factors to DV
- Inferential Statistics** – Kruskal Wallis Statistics
- Effects of Aerobics Exercise and Parenting Education on Postnatal Depression
- All statistical level of significance was set at  $p < 0.05$ .
- Data were analysed using Statistical Package for Social Sciences (SPSS) v. 21.0 (IBM, 2012)

- A reduction in PND was noted at 5 weeks and at 10-weeks follow up after aerobic exercise, although not statistically significant.
- The short duration and frequency of the study's aerobic exercise program along with the small sample size may have led to the findings opposite the studies which proved aerobic exercise to be effective in reducing PND (Daley, Jolly & MacArthur, 2009; Norman, Sherburn, Osborne & Galea, 2010).

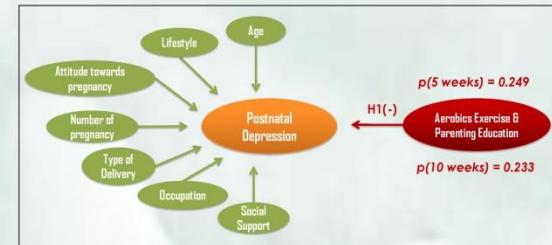


Figure 3. Effect of Aerobic Exercise on Postnatal Depression

## RESULT & DISCUSSION

Table 1. Demographic characteristics of Control Group & Experimental Group at Baseline

Characteristics	Control Group (n = 7)	Experimental Group (n = 7)	p-value
<b>Age</b> (mean ± SD, years)	20.57(1.39)	20.57(1.61)	1.000
<b>Breastfeeding</b> (mean ± SD, months)	6.71(3.25)	4.57(4.39)	.320
<b>Parity</b>	1.86(.37)	1.57(.53)	.273
<b>Attitude towards Pregnancy</b> (mean ± SD, VAS in cm)	5.57(.53)	5.29(.48)	.317
<b>Occupation</b>	1.43(.53)	1.43(.53)	1.000
<b>Type of Delivery</b> (Number of NVD)	7	7	.419
<b>APGAR score</b> (mean ± SD)	7.5714(1.90)	6.5714(1.27)	.270
<b>PSS score</b> (mean ± SD)	19.7143(2.36)	17.8571(3.43)	.261
<b>EPDS score</b> (mean ± SD)	15.8571(2.54)	14.1429(4.37)	.388

## CONCLUSION & IMPLICATION TO PRACTICE

- Younger mothers tend to have higher risk of PND indicating the need to build better support systems to prevent risk of PND.
- Though not statistically significant, aerobic exercise can reduce PND; to be more effective, aerobic exercise must be instituted over longer periods and higher intensity.

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# Poverty eradication and health, is microcredit a good idea?

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## Introduction

In poverty-stricken Bangladesh, microcredit is regarded as one of the innovative ways to help the poor. Introduced and popularized in 1980s, this tool encouraged women to engage in income-generating activities and participate in the free market. Soon the world learned the lessons from Bangladesh and started replicating the model to eradicate poverty.

Apart from access to finance, health and education are integral to human development. Most of the microcredit providers, also called microfinance institutions (MFIs), also carry out health or/and education programs. Their health programs encompass a range of options including: health education and promotion, vaccination, access to health-related products like drugs, health micro-insurance and loans to private health providers, deployment of community health workers, and direct provision of health care. Provision of health care by MFIs has evolved over time, and expanded from preventive, primary care to hospital care. MFIs claimed that their service complemented the public sector by meeting the demands of the poor. To investigate the extent to which the poor were served, the author conducted a questionnaire survey among the public and MFI-supported hospitals.

## Methods and Materials

In this cross-sectional study, convenience sampling method was used to conduct an interviewer-assisted questionnaire survey among 347 female outpatients, with 170 in public hospitals and 177 in MFI hospitals. Independent variables were hospital characteristic (consultation fee) and patient characteristics categorized into predisposing factors (age, education and marital status) and enabling factors (microcredit membership and income). We evaluated how these factors contributed to MFI hospital use by performing bivariate and multivariate analyses.

## Results

Users of MFI hospitals were found to be younger (OR=1.80,  $p<.05$ ) and wealthier (OR=4.79,  $p<.0001$ ), compared with public hospital patients. Despite a higher utilization of preventive service in MFI hospitals, expenditure was significantly higher. Microcredit membership did not exhibit significant association with MFI hospital use.

Estimated odds ratios (and 95% CI) from multiple logistic regressions of MFI-hospital utilization on selected factors		
Indicator	MFI-hospital vs public hospital	
	OR (95% CI)	p
Age		
Old ( $\geq 31$ )	1	
Young (15~30)	1.80 (1.08-2.97)	*
Microcredit membership		
Non-member	1	
Member	1.38 (0.75-2.57)	
Income level (Bangladesh taka)		
Poor ( $\leq 4,500$ )	1	
Moderate (4,501-8,000)	2.35 (0.96-5.72)	
High ( $\geq 8,001$ )	4.76 (2.09-10.85)	***

\* $p<.05$ ; \*\* $p<.01$ ; \*\*\* $p<.001$ .

Controlled for level of urbanization, family size, marital status, and self-rated health.

## Discussion and Conclusion

MFI-hospitals served less poor patients and charged higher fees than public hospitals did. Their design seemed to exclude the poorest segment. The author argues that microfinance itself is a commercial product and has an inherent conflict with publicly-funded health service. Excluding the poorest is therefore a natural outcome.

The study has profound implications for two reasons. First, there is a huge population of microcredit clients, 21 million in Bangladesh alone and 200 million around the world. Second, the design of credit lending in Bangladesh has been followed by many development practitioners in other parts of the world. Problems that occurred in Bangladesh deserve attention because they affect many people not only in one country but many more in similar programs outside Bangladesh.

Finally, the author suggests a readjustment of health program in the microfinance sector to help it really benefit the poor in an affordable manner, and that foreign aid directly support the public health system in order to enhance accessibility as well as universal coverage.



Name: Hsiao-wei Yu

Title: Factors of the Disablement Process and Disability Trajectories among Older Adults in Taiwan:  
A Latent Class Growth Modeling Approach

1<sup>st</sup>

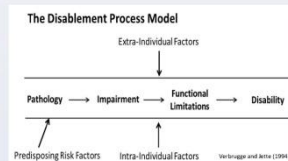
# Factors of the Disablement Process and Disability Trajectories among Older Adults in Taiwan: A Latent Class Growth Modeling Approach

Hsiao-Wei Yu, Ya-Mei Chen  
Institute of Health Policy and Management, National Taiwan University



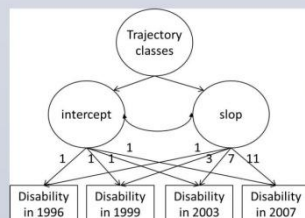
## BACKGROUND and OBJECTIVES

- Disability is a complex process interplayed with multiple factors. One of the dominant theoretic frameworks of disability, **the disablement process model** indicates that three sets of factors, named **predisposing, intra-individual, and extra-individual factors**, act in moderating the speed of progression toward disability.
  - In studying of progression of disability, a new concept of **disability trajectory**, becomes popular as statistics improvement and provides abundant information regarding the functional changes with time.
- The objectives of this study are:
- identify the distinct **subgroups of ADLs and IADLs disability trajectories** among older population in Taiwan.
  - examine whether the predisposing, intra-individual, and extra-individual **factors of the disablement process model** might predict Taiwanese older adults developing into different disability trajectories.



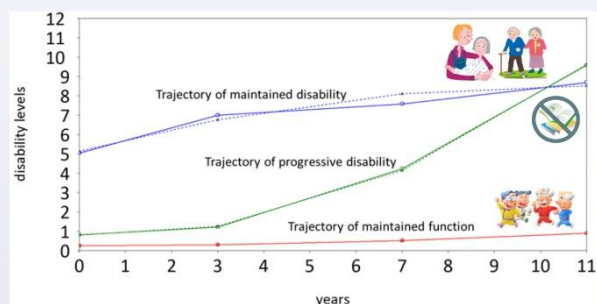
## Method

- Samples were from 4 waves of **Taiwan Longitudinal Study on Aging Survey** during 1996-2007 (n=3186).
- The main outcome variables, disability trajectories for activities of daily living (ADL) and instrumental activities of daily living (IADL) in each wave of survey, were identified by using **latent class growth curves modeling**.
- The other predicting variables at baseline included predisposing factors such as age, gender, educational levels, comorbidities and depressive symptoms; intra-individual factors such as health behaviors, social relations, and leisure time activities; extra-individual factors such as using assistive devices. The relationships between trajectories and factors of the disablement process model were examined by applying **hierarchical logistic regression**.



The conceptual framework of disability trajectories by using latent class growth curves modeling

## RESULTS Three Disability Trajectories among Older Adults in Taiwan



X-axis showed the survey time (years) and Y-axis showed the disability levels. The membership probabilities of three disability trajectories were:

### •Trajectory of Maintained Disability (3.95%)

- the characteristics of older adults in maintained disability trajectory were **in between** the other two trajectories in terms of the **age, the numbers of physiological and psychological illness**.
- people belonging to the trajectory of maintained disability were less engaging in leisure time activities and decreased their social network comparing with their counterparts, but they seemed to **use more of assistive devices** when started disabled.

### •Trajectory of Progressive Disability (11.27%)

- people in the progressive disability trajectory seemed to be the **oldest-old** and have the **highest number of comorbidities** than the rest people in other two trajectories.
- They were also noted to be **less educated** and **less use of assistive devices** comparing with the elderly in the maintained function and maintained disability trajectory, respectively.

### •Trajectory of Maintained Function (84.78%)

- older adults were more likely to be **younger**, with **less comorbidities, fewer depressive symptoms**, behaving **active leisure time activities**, but less satisfactory with social support than those in the progressive and maintained disability trajectories counterparts.

## Conclusion

Based on the systematic assessment in terms of the disablement process model, the findings suggested that **predisposing, intra-individual, extra-individual factors played different roles in predicting older adults' disability trajectories**.

We would like to thank to any comments for improving this study comprehensively. E-mail contact: d00848008@ntu.edu.tw



Name: Ming-Jui Yeh

Title: A sense of common: How Do People Recognize the National Health Insurance as a Public Health System?



# A SENSE OF COMMON:

## How Do People Recognize the National Health Insurance as a Public System?

葉明叡 MING-JUI YEH

Institute of Health Policy and Management, CPH, NTU

### Introduction

In modern democratic public policy making process, citizens require a higher level of responsiveness, accountability, and transparency toward the decision-makers. A broader inclusion of social values and public participation is needed to foster legitimacy of the public policies. Enabling the "affected" ones to have a say about the policies is often regarded as common sense. Yet the representative democracy seemed to fail the expectation, this could be observed by the prevailing of deliberative democracy since the 1990s. As Iris Young had noted, "Democracy is hard to love." Both participatory policy making and deliberative democracy are based on the presumption that citizens have the capabilities to be involved or to participate actively, that they have a sense of common that would urge them to put aside individual interests and pursue common good through social cooperation. In other words, citizens are presumed that they have recognition of the public system in the context. Using the National Health Insurance in Taiwan as an example, it was my attempt to verify this presumption.

### The NHI and It's Users in Taiwan

The National Health Insurance (NHI) in Taiwan is a public-funded single-payer health insurance system enacted in 1995. The system is a compulsory social insurance that all citizens and legal residents should join the program and pay for the redistributive-based premium. The coverage rate is up to 99% of legal residents in 2013.

### Objective

In this study, I would answer following questions: How do people recognize the National Health Insurance itself? How do people recognize the NHI's users? How do people interpret the meaning of a public system? Under what circumstances would people be willing to reduce their welfare to maintain the system's sustainability? Any deliberative democracy and other innovative public participation methods would not be applicable unless these questions are answered and the presumption verified. The experiences in Taiwan might provide some inspiration to the other countries which also attempt to enhance the public involvement and legitimacy of their healthcare system.

### Method

The descriptive ethics approach was adopted. It is an empirical branch of ethics research to explore what people think is right or wrong. I conducted qualitative semi-structured interview myself with five interviewees (Table 1). Also, a thought experiment was implemented in two of five the interviewees, using a fictitious story which was analogous to the real world decision condition to foster the clarification of their preferences and values (Table 2). Because of the nature of exploratory study, the five interviewees were selected with convenient sampling. The interviews were conducted, recorded, and transcribed in Chinese.

Gender	Age	Education	Occupation
Male: 2	18-30: 2	Master: 4	Master student
Female: 3	31-40: 3	Bachelor: 1	Internet marketing
			Urban renewal
			Freelancer
			Electronic manufacturing

Table. 1 The social-demographic information of the five interviewees

#### The Story

You are a villager of a distant village. One day a strange-looking merchant came to your village. She was selling a *magic drink*. She claimed that whoever drinks this *magic drink* she or he would recover from any kind of illness and disease right away. The *magic drink* is so rare that it costs the annual income of every villager. No one could afford it alone. The village head assembled all villagers to decide whether to buy the *magic drink*.

Question 1: Would you agree to raise a village fund to buy that *drink*? Why?

Because the drink was so valuable, villagers decided to buy a bottle of it. The next question is that: how to decide the priority to have the *drink*?

Question 2: How you make the decision? Why?

Other conditions:

The curative effect of the drink was as real as the merchant had claimed. There was no negative side-effect. The drink was for one person's serving only.

Table. 2 The story used in the thought experiment

### Results

There were three themes emerged from the data.

- (1) First, five interviewees all recognized that the NHI is system based on the presumption of social cooperation and its logic is to redistribute resources from the advantaged to the disadvantaged. The reasons to cooperate and redistribute might be reciprocity, national identity, or merely philanthropy. Most importantly, interviewees believed that the healthcare services are ones that government should provide to all citizens. Therefore it is a matter of fairness to guarantee healthcare accessibility by the NHI.
- (2) Second, five interviewees disagreed that any citizens could voluntarily abandon his/her entitlement to the NHI because it might undermine the maintenance of the system. "You don't join the NHI and any other social insurances, well then, you don't have to pay the taxes? Right? I never go to a park, why do I have to pay the taxes (for it)? I never drive a car, why do I have to pay for the air pollution fee?.....No, you can't do that, because you're living in the environment." Interviewees showed a rather stringent attitude toward the expatriates. Since the expatriates left their community in the first place, they had to compensate more once they attempted to rejoin the community and have their entitlement back.
- (3) Third, under limited resources, the interviewees said that if the government had taken actions on saving avoidable waste, they would be willing to pay more for the system. But this is not going to happen due to the distrust toward the government. The government in the context means not only the NHI Administration or the Ministry of Health and Welfare alone; it included the whole Taiwanese government body.

### Discussion and Conclusion

The interviewees seemed to have a weak notion of the NHI as a public system. They have recognized the public system with various motivations. However, they also agreed that no one could be excluded from the system. Therefore, it was necessary to acknowledge and support such a system. Is this an expression of some sort of social cooperation and a sense of common? Or is it just a temporal equilibrium of individual interests? Further researches are needed to answer these questions.



Name: Fang-Ying Li, Chiung-Chao Hung Lin, Sooning Zhou, Sandy King, Ting Lin  
 Title: We are Miss Condom fighting against AIDS! An AIDS Prevention Program among Sex Workers in Taiwan?

APRU

Association of Pacific Rim Universities

## We are Miss Condom fighting against AIDS! An AIDS Prevention Program among Sex Workers in Taiwan

Fang-Ying Li<sup>1</sup>, Chiung-Chao Hung Lin<sup>2</sup>, Sooning Zhou<sup>2</sup>, Sandy King<sup>2</sup>, Ting Lin<sup>2</sup>

<sup>1</sup>National Taiwan University, Institute of Health Policy and Management

<sup>2</sup> Taiwan AIDS Foundation



### Issues:

Unsafe sex between heterosexuals is one of the major causes of newly diagnosed HIV infection in Miaoli, Taiwan. Miaoli county is an agriculture-based plain, and the sex industry here were has a unique social-culture context. For more than 70 years, when Taiwan was a colony of Japan, "Sishihmei S." has developed as a famous red-light district in Miaoli. Untile today, there were over one hundred whorehouses that belong to different gangsters, and all of them are illegal. For this reason, it is hard for public health agencies to reach the female sex workers (FSWs), and do HIV/AIDS prevention.



### Project:

So it's time to bring in the force of scholars and NGOs to fight against HIV/AIDS. We started to proceed structural interventions that refers to alter physical, normative environments, and structural context to help people all at once in Sishihmei S. since 2011. Firstly, we collaborated and negotiated with government health agency, police, and local community leaders. And to build rapport with FSWs, brothel owners and bouncers, we went door to door to visit them, hand out free condoms, and provide HIV testing information to them actively. Moreover, we set up "She's beauty Café" for FSWs to relax and enjoy. Here, they can chat with us about their work, their life, and counsel about their health status freely. We also disseminated HIV/AIDS prevention and health promotion information, and held related entertainment activities there. Besides, we also contact with clients, because by understanding the importance of safe sex, they become disincentive to ask sex workers not to use condom.

### Results:

In the beginning, few brothel madams realized the importance of AIDS prevention, and some FSWs were afraid that we are secret agents of police, so most of them had no motivation to contact with us or participate in our interventions. After building rapport and trust with them over a period of time, they became familiar with us, and gave us a nickname "Miss Condom."

Now the FSWs attended the health promotion campaign enthusiastically, learned about HIV/AIDS related knowledge and skills to protect themselves, including how to use condom correctly, and the ways to let their customer use condom actively. The results of our evaluation survey indicated that knowledge about AIDS of the FSWs became more correct, the frequency of using condom raised, and the percentage of accepting HIV testing increased (Table 1). Table 2 shows results of logistic regression analysis that FSWs whose knowledge about AIDS were better (OR=3.37, 95%CI=1.41-8.03), have ever got HIV testing (OR=2.31, 95%CI=1.09-4.88) were more likely to use condoms during sex trade.

**Table 1 Demographic Trait and HIV/AIDS Related Knowledge and Behavior of Samples**

	2011 (n=101) (%)	2012 (n=39) (%)	2013 (n=48) (%)
Age (mean age)	49.6	48.5	46.6
Education			
Elementary school and below	36.6	33.3	39.6
Junior high school	33.7	28.2	18.8
Senior high school	25.7	30.8	25.0
College and above	4.0	7.7	16.7
Knowledge (mean score)	4.5	5.0	5.3*
Frequency of Condom Use			
Always	26.7	46.2	41.7**
Often	23.8	33.3	27.1
Sometimes	18.8	15.4	22.9
Seldom	9.9	5.1	6.2
Never	20.8	0.0	2.1
HIV Testing Experience			
Yes	72.3	84.6	89.6*
No	27.7	15.4	10.4

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

**Table 2 Logistic Regression of Factors Associated with Condom Use among FSWs**

Variable	Odds Ratio	95%CI
Age	1.00	0.98-1.04
Education Level (high vs low) <sup>a</sup>	0.61	0.32-1.20
Knowledge about AIDS (good vs not good) <sup>b</sup>	3.37	1.41-8.03**
Testing Experience (yes vs no)	2.31	1.09-4.88*

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

<sup>a</sup>"high education level" refers to "senior high school and above"; "low education level" refers to "junior high school and below"

<sup>b</sup>The total scores of AIDS Knowledge is 6 points. "Good" refers to "4 points and above"; "Not Good" refers to "3 points and below"

### Lessons Learnt:

To achieve the goal "get to zero new infections", one of the "Three Zeros" strategy proposed by UNAIDS to fight against AIDS, we should enlist and connect all the related stakeholders in the sex industry network while we proceeded HIV/AIDS prevention programs. In addition, to make programs successful, it is important for we scholars and NGOs to consider the culture and traits of local sex industry, build trust with target groups, and apply flexible characteristics to design and implement tailored interventions.



Name: Hon-Yen Wu, Chiao-Ling Peng, Pei-Chun Chen, Yu-Kang Tu, Chee-Jen Chang, Kuan-Yu Hung, Kuo-Liong Chien, Mei-Shu Lai  
 Title: Comparative Effectiveness of Different Renin-angiotensin System Blockers in Diabetic Patients: A Nationwide Cohort Study



## Comparative Effectiveness of Different Renin-angiotensin System Blockers in Diabetic Patients: A Nationwide Cohort Study

Hon-Yen Wu<sup>1,2,3</sup>, Chiao-Ling Peng<sup>3</sup>, Pei-Chun Chen<sup>3</sup>, Yu-Kang Tu<sup>3</sup>,  
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<sup>2</sup>Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan.

<sup>3</sup>Graduate Institute of Epidemiology and Preventive Medicine, National Taiwan University, Taipei, Taiwan.

<sup>4</sup>Graduate Institute of Clinical Medical Sciences, Chang Gung University, Taoyuan, Taiwan

### Background

Diabetes is a global epidemic and a major cause of long-term dialysis and death. As guidelines indicate that angiotensin converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs) have similar cardiorenoprotective effects for diabetic patients, so far there has been no consensus about the priority for these treatments.

### Methods

We assessed the hypertensive patients in the Longitudinal Cohort of Diabetes Patients from the National Health Insurance Research Database of Taiwan since 1996. Enrolled participants should be 18 years or older, with continuous use of antihypertensives for at least 90 days. Cox's proportional hazard models were used to evaluate ACEIs versus ARBs for the outcomes of long-term dialysis, acute kidney injury, hyperkalemia, and all-cause death.

### Results

34043 (58.9%) patients received ACEI therapy and 23772 (41.1%) patients received ARB therapy, and were followed-up until the end of 2011. During a mean follow-up time of 8 years, a total of 1548 long-term dialysis, 393 acute kidney injury, 1751 hyperkalemia, and 506 deaths have occurred. Our analyses showed no differences among ACEIs versus ARBs for long-term dialysis (hazard ratio 0.92, 95% confidence interval 0.82 to 1.02), acute kidney injury (1.11, 0.88 to 1.39), and hyperkalemia (1.05, 0.94 to 1.17). ACEIs showed a significantly higher mortality (1.20, 1.01 to 1.44) than ARBs after multivariate adjustment.

### Conclusion

This study demonstrates no differences in the long-term renal outcomes between ACEI and ARB users, but a higher mortality among ACEI users. Because of the retrospective and observational nature of the study design, result should be interpreted conservatively.

Table. Incidence rates and hazard ratios for outcomes compared ACEI with ARB

Outcome	Events, No.		Incidence Rate per 1000 Patient-Years		Hazard Ratio (95% Confidence Interval)	
	ACEI	ARB	ACEI	ARB	Crude	Fully adjusted <sup>a</sup>
Long-term dialysis	975	573	3.45	3.26	1.04 ( 0.93 – 1.15 )	1.04 ( 0.93 – 1.15 )
Acute kidney injury	269	124	0.95	0.70	1.25 ( 1.01 – 1.55 ) *	1.11 ( 0.88 – 1.39 )
Hyperkalemia	1183	568	4.18	3.23	1.22 ( 1.11 – 1.35 ) *	1.05 ( 0.94 – 1.17 )
Death	263	243	0.92	1.38	0.65 ( 0.55 – 0.77 ) *	1.20 ( 1.01 – 1.44 ) *

Note.

Abbreviations: ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker.

<sup>a</sup>Cox proportional hazards model adjusted for age, sex, Charlson comorbidity index, geographic location, occupation, income, and year of index date.

\* $P \leq 0.05$ .



Name: Yun-Yi Chen & Ya-Mei Chen

Title: Multidimensional Health Status among Community-dwelling Older Adults in Taiwan:  
Do Unmet Needs Matter?

2<sup>nd</sup>



## Multidimensional Health Status among Community-dwelling Older Adults in Taiwan: Do Unmet Needs Matter?

Yun-Yi Chen & Ya-Mei Chen, National Taiwan University

### Background

- Research has shown that unmet need can lead to a variety of negative consequences for disabled older adults.
- However, the influence of unmet need on health status has yet to be investigated.

### Method

- This study used a longitudinal sample of community-dwelling older adults ( $\geq 53$  y/o), representative of the overall population in Taiwan over an eight-year period (1999-2007).
- Measures of unmet needs: personal assistance in dealing with ADLs, personal assistance in dealing with IADLs, and access to healthcare.
- Measures of health status: self-rated health (SRH), psychological distress, cognitive function, and functional disability.
- Generalized estimating equations (GEE) were adjusted for socio-demographic factors psychosocial factors, number of chronic illnesses, and health status at baseline.

### Result

- The prevalence of unmet needs:

Unmet needs	Year 1999 (n=1389)		2003 (n=842)		2007 (n=559)	
	n	%	n	%	n	%
Unmet need in ADL	51	3.67	17	2.01	10	1.79
Unmet need in IADL	153	11.02	70	8.28	37	6.61
Difficulty in gaining access to healthcare	104	7.49	72	8.52	44	7.86

- The perception of unmet ADL need and difficulties in accessing healthcare were significantly associated with poorer SRH, and higher levels of psychological distress, ADL disability, and IADL disability, when controlled for covariates.
- Unmet IADL need was associated with poorer SRH and higher level of psychological distress.
- However, only the perception of difficulty in gaining access to healthcare was associated with reduced cognitive function.

- Impact of unmet needs on health:

	Poorer Self-Rated Health	Higher Psychological Distress	Higher ADL Disability Level	Higher IADL Disability Level	Reduced Cognitive Function
Unmet need in ADL	***	***	***	***	✓
Unmet need in IADL	***	***	✓	✓	✓
Difficulty in gaining access to healthcare	***	***	***	***	***

### Discussion & Conclusion

- As for reasons unmet need affects health:

- ✓ A lack of proper aid can prevent older adults from gaining access to resource.
- ✓ Unmet need may directly or indirectly cause stress.
- ✓ It is difficult for those with unmet need to maintain a safe environment or receive proper healthcare resources when lacking social support and social network.

- To the best of our knowledge, this is the first study to examine the influence of unmet need on various health aspects using longitudinal data from nationally representative samples.
- The limitations of this study include (1) attrition, (2) self-reported data, and (3) medical histories prior to the baseline not included in the scope of the analysis.
- With regard to policy implications, this study points out that disabled community-dwelling older adults with unmet needs may suffer from relatively degraded health. Therefore, satisfying the care may avoid the need to enter long-term care facilities early and reduce their dependence on public resources, thereby reducing the overall disease burden and medical expenditures for society.





# Adherence to Quality Indicators Can Narrow the Disparity in Mortality among Lung Cancer Patients

Yun-Yi Chen & Kuo-Piao Chung, National Taiwan University

## Background

- Concern has been raised over the disproportionate mortality among lung cancer patients with low socioeconomic status.
- Physician adherence to evidence has been shown to improve outcomes in cancer care.

## Aims of Study

- To determine whether compliance with core measures at the patient level is correlated to survival and whether socioeconomic differences exist in the survival of lung cancer patients
- To investigate whether compliance with core measures influences the survival of lung cancer patients from different socioeconomic backgrounds

## Data Resource

- National-wide databases: the Taiwan Cancer Database (2004-2007), the National Health Insurance database (2004-2007), the death registry (2004 to 2010)

## Participants

- Patients newly diagnosed with non-small cell lung cancer between 2004 and 2007 (Cases excluded: Stage 0, inconsistent timing between the treatment and time of death)

## Statistical Analysis

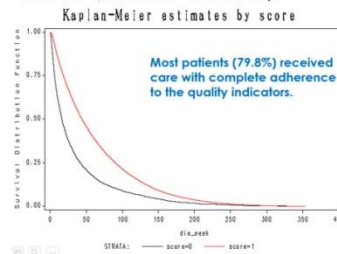
- Using Cox proportional-hazards regression model, controlling for the characteristics of patients and the characteristics of healthcare providers

## A Set of Quality Indicators – Core Measures of NSCLC

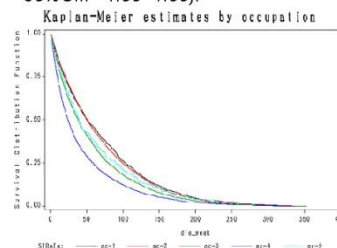
- The modified Delphi method was used to identify the core measures for lung cancer in Taiwan, including 16 indices.
- We then calculated the core measure achievement rates of the patients and used composite scores for the calculation of compliance (100% adherence or not).

## Result

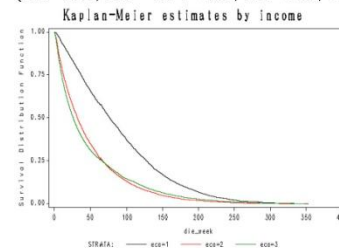
- Multivariate analysis revealed that 100% adherence was associated with better overall survival (Cox Regression: HR=0.54, 95% C.I.= 0.52-0.56).



- The unemployment patients were at highest risk of mortality (HR=1.44, 95% C.I.= 1.35 -1.55).



- Patients with lower income were at high risk of mortality (HR=1.81, C.I.= 1.74 -1.89; HR=1.68, C.I.= 1.61 -1.75).



- 100% adherence to quality indicators significantly moderate the relationship between socioeconomic factors and survival conditions.

Interaction	HR	95% C.I.	
Compliance*Middle level income	0.56	0.53	0.59
Compliance*Low level income	0.55	0.51	0.58

## Discussion

- The correlation between survival rates and socioeconomic factors of lung cancer patients highlights the issue of health disparity.
- It is worth noting that in this study, full compliance with core measures during the diagnosis and treatment was proved to have moderating effects on the influence of patient income and occupation on survival.
- The influence of compliance with core measure on survival was even more pronounced among patients from a low socioeconomic background, compared to those with high socioeconomic status.
- The results of this study imply that changing medical practices could alter the influence of socioeconomic factors and reduce the risk of death for cancer patients with low socioeconomic status.

## Conclusion

- Although socioeconomic differences of survival exist in non-small cell lung cancer, complete adherence to quality indicators may narrow the disparity.



# Older Adults' Functional Disability and Social Accommodation Trajectories: An Application of Parallel Process Modeling Using a National Sample from Taiwan

Chen, Y. M., Chiang, T. L., Chen, D. Z, Yu, H. W., Tu, Y. K.  
 Institute of Health Policy and Management, National Taiwan University  
 Institute of Epidemiology and Preventive Medicine, National Taiwan University



## BACKGROUND AND OBJECTIVES

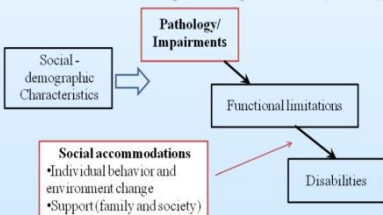
Successful aging and less functional disability has become a key public health priority in Taiwan as well as in many other fast-aging societies. Studies have pointed out the importance of social accommodations on older adults' ability to maintain physical function. It was not clear in the literature that to what extent the initial level and rate of change of older adults' social accommodation factors would affect the rate of change in older adults' functional disability.

Past studies used accommodation factors at a single time point to examine the effect of a single type of functional status may not fully understand the relationships in older adults

**This study assessed the trajectories of late-life functional disability in Taiwan from 1996 to 2007, and explored how social accommodation factor trends interplayed with disability trajectories.**

## METHODS

- Data Source: Health and Living Status of the Middle Aged and Elderly in Taiwan. Four waves of survey data—year 1996, 1999, 2003, and 2007



- Sample: 3186 older adults who have completed 2007 survey and at least 2 surveys among 1996 to 2003 surveys
- Theoretical framework: Martin's Disablement Process Model

- Analysis: **Parallel process latent growth curve modeling**
- Three functional disability measures were used to model the functional disability trajectory: (1) Nagi's functional limitations, (2) activities of daily living, and (3) instrumental activities of daily living.
- Social accommodation trajectories were examined for their influence on the functional disability trajectories: (i) leisure time activity and (ii) support from family and friends (ex. physical contact and emotional support)

## RESULTS

- The parallel process model had good fit to the data:  $\chi^2 [137, N = 3,080] = 1,753.636, p < .001$ ; CFI = .95; TLI = .94; RMSEA = .062; SRMR = .045.
- Higher baseline level of leisure time activity predicted lower baseline level of functional disability ( $B = -.21, p < .001$ ) and a slower rate of developing functional disability over time ( $B = -.10, p < .01$ ).
- Developing more types and greater frequency of leisure time activities predicted a slower rate of functional disability over time ( $B = -.92, p < .001$ ).
- The trajectories of other factors were not found to be significantly associated with functional disability trajectories.



## CONCLUSION

Through parallel latent growth curve modeling, we emphasized:

- The importance of encouraging older adults to start engaging in leisure time activities early on and to continue to increase their leisure time activity participation over time.
- The increase in leisure time activity has as much as 3 times the effect on disability as the baseline level of participation.
- Although it is never too late to start engaging in leisure time activities, the current study findings would strongly suggest starting early.

**Never Too Early to Increase Leisure Time Activity !!**

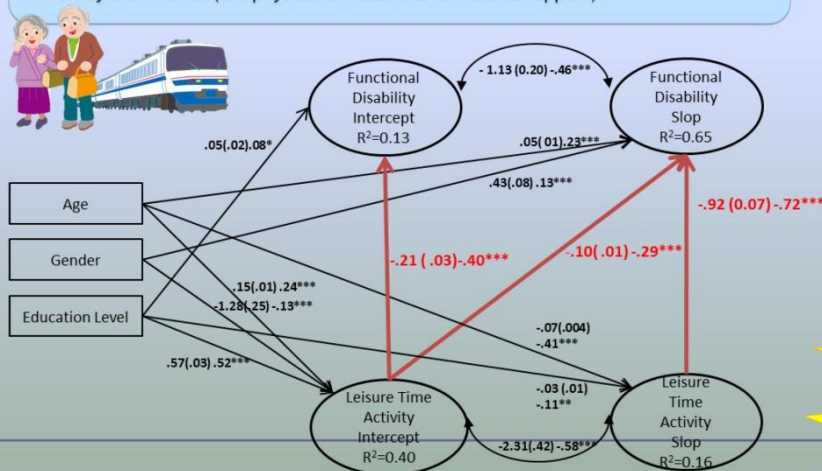


Figure. Parallel Latent Growth Curve Model for Leisure Time Activity and Functional Disability  
 Note. Parameter estimates are reported as unstandardized (standard error) standardized