2. 学会発表

(1) 江啓発、Singeo Jr Travis S、Ikerdeu Edolem、八谷寛、本庄かおり、三田貴、張燕、Hilawe Esayas、王超辰、川副延生、上村真由、崔仁哲、磯博康、Watson Berry Moon、青山温子：パラオ一般住民における生活習慣病リスク要因について。第 29 回 日本国際保健医療学会学術大会、東京 (2014)。

(2) 江啓発、八谷寛、本庄かおり、李媛英、崔仁哲、磯博康、張燕、王超辰、上村真由、青山温子：パラオ若年成人者層における生活習慣病リスク要因について。第 73 回日本公衆衛生学会総会、宇都宮 (2014)。

F. 知的財産権の出願・登録状況

1．特許取得　なし
2．実用新案登録　なし
3．その他　なし

図 1. 中国房山地区にある村

図 2. 調査前に説明する

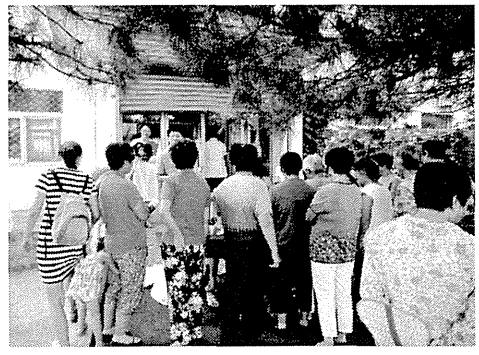


図 3. 血圧測定

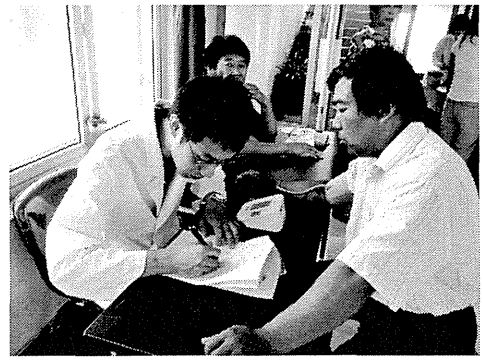


図 4. 採血する場面

表 1　国際セミナー •スケジュール

10 月 2 日（木）		会場：大阪大学銀杏会館 3 階会議室	
	9:00～9:30	受付	
オリエンテーション	9:30～9:45	セミナーの主旨	座長：大阪大学 磯博康 教授 名古屋大学 青山温子 教授
講演 1	9:45～11:00	パラオ研究: ①NCD と予防対策 (30 分) ②パラオ研究と STEPS プロファイル (30 分) 討議 (15 分)	パラオ保健省　Berry Moon Watson、 名古屋大学　江啓発 助教
	11:00～11:10	休憩	
講演 2	11:10～12:00	生活習慣と中国房山コホート研究　(40 分) 討議 (10 分)	北京大学公衆衛生学院　Peiyu Wang 教授
	12:00～13:30	昼休み	
講演 3	13:30～14:20	タイコホート研究 (40 分) 討議 (10 分)	オーストラリア国立大学　Adrian Sleigh 教授 スコータイ・タマティラット公開大学　Sam-ang Seubsman 准教授
講演 4	14:20～15:10	タイにおける NCD と予防対策 (40 分) 討議 (10 分)	タイ保健省　Thaksaphon (Mek) Thamarangsi
	15:10～15:30	休憩	
講演 5	15:30～16:20	NCD と予防対策：バングラデシュ (40 分) 討議 (10 分)	バングラデシュ・ナショナル心臓財団病院研究所 Sohel Reza Choudhury 教授
一般討議	16:20～17:00	アジア、ミクロネシアでの NCD 対策と共同研究に関する討論	座長：磯博康 教授 青山温子 教授 コメンテーター：北京大学　Yonghua Hu 教授 パラオ保健省　Sherilyn Madraisau 藤田保健衛生大学　八谷寛　教授.
	17:00～17:30	懇親会場へ移動	
懇親会	17:30～19:30	会場：銀杏会館 2 階「レストラン　ミネルバ」	
10 月 3 日（金）		会場：共同研究棟 7 階セミナー室	
研究成果と討議	9:00～12:00	北京研究、パラオの研究、タイ研究	司会：大阪大学　本庄かおり 特任准教授 発表者：張燕、王超辰、山中珠美、長谷川みゆき、佐田みずき、崔美善、若林真美
	12:00～	昼休み	
	午後	自由	
大学院セミナー	17:30～19:30	①生活習慣と NCD：北京房山コホート研究 ②生活行動パターンと NCD：タイコホート研究	座長：大阪大学　本庄かおり 特任准教授 演者：①北京大学：Peiyu Wang 教授 ②オーストラリア国立大学：Adrian Sleigh 教授 スコータイ・タマティラット公開大学 Sam-ang Seubsman 准教授

図 5　Meeting before field work

図 6　Field work (Focus group discussion)

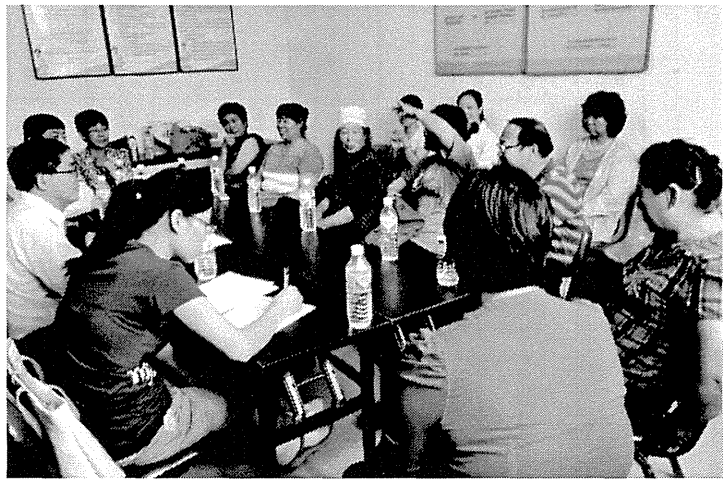


図 7　Field work (Personal interview)

表 2　Alcohol consumption according to age

Age	Men			Women		
	18-19 (n=57)	20-21 (n=65)	22-24 (n=51)	18-19 (n=89)	20-21 (n=61)	22-24 (n=30)
Alcohol						
Ever consumed, %	89.5	93.8	96.1	71.9	75.4	76.7
Consumed alcohol in past 12 months, %	80.7	76.9	86.3	55.1	57.4	66.7
Frequency of alcohol consumption in past 12 months						
Daily, %	0	0	5.9*	1.1	0	0
5-6 days per week, %	1.8	4.6	7.8	0	0	3.3*
1-4 days per week, %	21.1	23.1	19.6	6.7	6.6	6.7
1-3 days per month, %	31.6	32.3	33.3	21.3	27.9	30.0
Less than once a month, %	45.6	40.0	33.3	70.9	65.6	60.0
Consumed alcohol in past 30 days, %	63.2	64.6	74.5	32.6	37.7	43.3
Ocations of alcohol consumption in past 30 days						
Daily, %	0	0	2.0	0	0	0
5-6 days per week, %	0	0	3.9	0	0	0
1-4 days per week, %	10.5	10.8	11.8	3.4	6.6	3.3
1-3 days per month, %	50.9	53.8	54.9	29.2	31.1	40.0
Less than once a month, %	36.8	35.4	25.5	67.4	62.3	56.7

*p<0.05, **p<0.01, ***p<0.001

表 3　Alcohol consumption according to ethnicity

Ethnicity	Men		Women	
	Palau (n=151)	Others (n=22)	Palau (n=157)	Others (n=23)
Alcohol				
Ever consumed, %	94.0	86.4	79.6	34.8***
Consumed alcohol in past 12 months, %	84.1	59.1**	61.8	30.4**
Frequency of alcohol consumption in past 12 months				
Daily, %	2.0	0	0.6	0
5-6 days per week, %	5.3	0	0.6	0
1-4 days per week, %	20.5	27.3	6.4	8.7
1-3 days per month, %	35.1	13.6*	28.0	4.3*
Less than once a month, %	37.1	59.1*	64.3	87.0*
Consumed alcohol in past 30 days, %	70.2	45.5*	38.9	17.4*
Frequency of alcohol consumption in past 30 days				
Daily, %	0.7	0	0	0
5-6 days per week, %	1.3	0	0	0
1-4 days per week, %	10.6	13.6	5.1	0
1-3 days per month, %	56.3	31.8*	33.8	17.4
Less than once a month, %	29.8	54.5*	61.1	82.6*

*p<0.05, **p<0.01, ***p<0.001

表 4　Rate of smoker in Palau state among age 18 to 24 years

			Total	Male	Female
Current smoker	Koror	n	235	163	72
		%	16.9	25.3	9.7
	Other	n	128	91	37
		%	15.8	23.0	8.9
Non-smoker	Koror	n	1154	482	672
		%	83.1	74.7	90.3
	Other	n	683	305	378
		%	84.2	77.0	91.1

表 5　Mean BMI and prevalence of overweight and obesity

Age	Sex	N	Mean BMI±SD	Overweight(%)	Obesity(%)	Total(%)
25-39	Male	323	28.88±6.60	32.82	36.22	69.04
	Female	351	29.37±7.31	26.78	41.88	68.66
	Total	675	29.13±6.97	29.78	39.11	68.89
40-54	Male	463	29.58±5.93	34.56	42.55	77.11
	Female	541	30.26±6.40	30.31	48.24	78.55
	Total	1004	29.95±6.19	32.27	45.62	77.89
55-65	Male	236	29.54±5.86	38.98	42.37	81.35
	Female	251	30.13±5.94	36.25	46.61	82.86
	Total	487	29.84±5.90	37.58	44.56	82.14

表 6 Means of total cholesterol and triglyceride

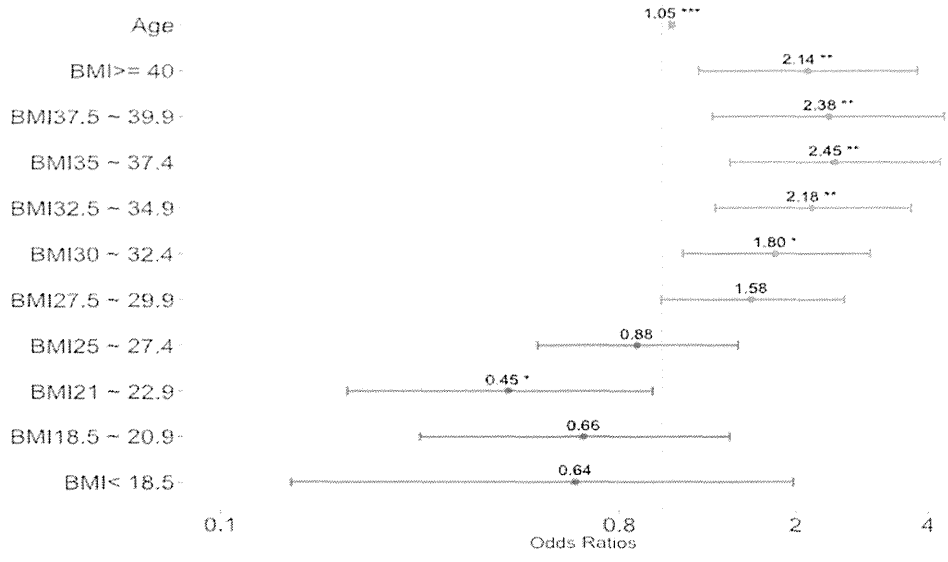
	Total		Men		Women	
Total cholesterol, mmol/L	No	Mean	No	Mean	No	Mean
Palauan	1406	3.75	655	3.7	751	3.79
Phillipino	351	4.00	170	3.98	181	4.01
Others	121	4.01	71	4.09	50	3.89
Triglyceride, mmol/L						
Palauan	1377	1.99	640	2.07	737	1.93
Phillipino	333	1.84	161	2.00	172	1.68
Others	121	1.83	72	1.99	49	1.60

表 7 Age- and sex-adjusted odds ratios for hypertension by BMI groups

BMI groups		n (affected/all)	Odds ratio	95% CI	Odds ratio	95% CI
Normal weight	< 18.5	9/51	0.49	(0.21,1.12)	1.00	---
	18.5 ~ 20.9	26/162	0.41	(0.25,0.70)***		
	21 ~ 22.9	53/209	0.68	(0.44,1.03)		
	23 ~ 24.9	104/282	1	---		
Overweight	25 ~ 27.4	187/386	1.45	(1.03,2.03)*	2.04	(1.62,2.58)***
	27.5 ~ 29.9	212/417	1.52	(1.09,2.12)*		
	30 ~ 32.4	183/348	1.66	(1.17,2.34)**		
Obesity	32.5 ~ 34.9	142/240	2.09	(1.43,3.05)***	2.96	(2.37,3.71)***
	35 ~ 37.4	97/165	2.30	(1.51,3.50)***		
	37.5 ~ 39.9	76/113	3.68	(2.24,6.04)***		
	>= 40	94/156	2.61	(1.70,4.01)***		

Notes: CI = confidence interval;
* p < 0.05, ** p < 0.01, *** p < 0.001

表 8　Age adjusted odds ratios for being diabetes according to BMI categories



Reference group: BMI 23 ~ 24.9 kg/m^2.

表 9　Alcohol consumption and incidence of metabolic syndrome

	Odds ratio (95% CI)
Never	1.00
Moderate drinker	0.89 (0.67-1.45)
Binge drinker	1.28 (0.92-1.17)
Heavy drinker	1.95 (1.48-3.27)
Ex- drinker	0.81 (0.54-1.21)

Adjusted age, gender, socioeconomic factors, exercise, sedentary behavior, food preference, smoking, stress

資料 12: 国際セミナーでの発表・討論

International Conference – Graduate Student Seminar

Orientation: Seminar Aim

Hiroyasu Iso

Professor Hiroyasu Iso greeted the audience and introduced the subject of the international conference with an overview of non-communicable diseases (NCDs) in Asian countries. Accumulating evidence have shown an increase in the prevalence of NCDs in Asian countries. The WHO have also recognized NCDs as the leading causes of death, especially in middle and high-income countries. The three major NCD diseases have been coronary heart disease, stroke, and COPD.

Professor Iso also introduced the ten speakers of the conference coming from China, Thailand, Bangladesh, Palau, and Australia to talk about the arising problems, future solutions, and prevention and control measures for NCDs. The conference was financially supported by the Japanese Ministry of Health, Labour and Welfare as well as by an interim grant of Osaka University. Osaka University was given an international university grant by the Japanese government with the purpose of broadening its international activities, such as exchange student and faculty programs, as well as increasing the ranking of Japanese universities.

Professor Iso expected the meeting to be a good opportunity for the University to increase the number of exchange students and to build international connections. The university have also expected young foreign researchers to stay for a month and exchange information on research and education.

Professor Iso pointed out that there were several attendees from Osaka University, including Dr. Honjou, an associate professor of Global Collaboration Center. The Global Collaboration Center was planning to expand in order to include other departments and to broaden its international activity using the grant from the Ministry of Education. There were also many international students attending from countries like China and Hungary, as well as short-term visitor medical students from Groningen University of the Netherlands, which have had a strong relationship with Osaka University since professors from Groningen University helped to build the foundations of Osaka University.

In conclusion, Professor Iso expressed his happiness for countries getting together to talk about the issue of NCDs, which needs to be tackled through research in many fields as well as through governmental work. He hoped the meeting would provide a breakthrough in the NCD situation of Asian countries.

Atsuko Aoyama

Professor Aoyama stated that non-communicable diseases were a global issue. She also added that NCDs represented a major disease burden and were the major causes of death not only in the industrialized countries, but also in low and middle income countries.

Professor Aoyama was working together with Professor Iso, Professor Yatsuya, and other partners from different countries on non-communicable disease projects. (Professor Iso and Professor Yatsuya are both well known in the field of non-communicable diseases in Japan.) The aim of such projects was to develop an effective, efficient, and feasible strategy based on scientific evidence. Scientific evidence included not only epidemiological data, but also qualitative data. Since the project aimed at primary and secondary prevention of NCDs, it was important to look into the lifestyles of the people, including diet, physical activity, traditional beliefs, and social character, to understand and to prevent NCDs.

Professor Aoyama mentioned that they were also working together with the Republic of Palau, represented by Ms. Berry Moon Watson, who was going to present about an epidemiological study. Dr. Chifa Chiang would also present about the Palau study. The next lecture would be on the Fangshan cohort study of China. Professor Iso, Professor Wang, and Professor Hu were already collaborating in the Fangshan study of epidemiology.

In the afternoon session, Professor Adrian Sleigh, Professor Sam-ang, and Dr. Mek would present their studies from Thailand. Their presentations would focus on the Thai epidemiological study as well as on interventions by the government. The last lecture would be held by Professor Sohel from Bangladesh, who had started an epidemiological study which would be the focus of his lecture. Bangladesh have been a low-income country, but have had a high non-communicable disease burden. Professor Aoyama concluded by adding that she, along with Professor Iso, and Professor Sohel and Dr. Zaman from Bangladesh had started working on a new epidemiological study in Bangladesh.

Lecture 1: NCD and Prevention

School Health Screening: Magnitude of and the Factors Associated with Overweight among Children in Palau

Berry Moon Watson

Ms. Berry Watson stated that she had been working for Palau's health system for 29 years, with the last 16 of those years spent in the field of public health, specifically working in the area of maternal and child health. That was also the area where she started paying attention to NCDs and its risk factors in Palau, especially risks in young children and pregnant women.

In Palau, the school health screening program began in 2005. In 2004, many experts were brought together in Palau who made a decision to begin a school health screening and intervention program in relation to health. This meeting included discussion on basic information about NCDs and its risk factors, leading to questions about how further primary preventive interventions in schools could be provided, and how this could lead to legislative and regulatory measures in the Island. In 2005, Palau was identified by the WHO as one of the top 10 leading countries with very high rate of NCDs. Most of the top 10 countries belong to the Pacific. The above mentioned reasons led to the development of a health screening program for children.

Children with overweight were at greater risk for type 2 diabetes, hypertension, sleeping difficulty, psychosocial problems, and obesity in their adult or pre-adult years. Palau had for a long time realized the costliness of NCD burdens. In the Pacific, the costs of NCDs were about half of the resources that went into supporting the Ministry of Health. Most of the hospital resources went into supporting hemodialysis units. In Palau, when hemodialysis units started off in the '80s, there were only four hemodialysis patients, whereas today there are about 30-40 patients.

The nationwide program have measured the burden of overweight on children and quantified the familial, social, and economic burden. The burden did not only include measures of diseconomies of scale in the government or in the nation, but it extended to familial and social responsibilities, too. Most of the highly obese people were coming from the Pacific Islands, and Palau could have different risks and vulnerabilities amongst Pacific Island races. These studies would help to determine those risks for Palauans. There was also a compelling need to establish vital information early on so that changes could be monitored along the years.

Ms. Berry pointed out that Palau have always compared itself with the United States since the US had for the longest time provided support and resources to the island. The literature review estimated that 6.4% to 18% of students in the United States were either obese or overweight. In Palau this rate was

double. This increase of obesity and overweight was similar in other countries such as Japan, UK, Spain, France, and Greece. The burden of NCD has become a global issue.

There was also literature connecting increased body mass index (BMI) to depression and psychosocial problems. Depression symptoms were significant predictors for increased body mass. Children who reported binge eating gained an additional 15% more in BMI compared to those who did not report binge eating. There was an association between self-reported depression, anxiety, and weight-related distress among those who were overweight or obese. The prevalence of elevated blood pressure among adolescents was 2.8%, while the risk of hypertension among overweight children was 3.76%. Also, bullying affected teens' self-esteem and feeling of self-worth, and adults who were bullied as teens were found to have higher levels of depression and poor self-esteem.

What were the reasons for health screening of children in Palau? Ms. Berry pointed out that there were some rationales looked at and discussed during the forum meeting where education, health, and other partners got together to discuss the reasons for health screening. In 1999, Palau implemented the Youth Risk Behavior Survey (YRBS). This was originally a CDC-developed surveillance in the US. It was noted that most of Palau's risks were comparable with what is indicated in children within the 50 states of the US, and all trends were rising despite of the intensive mass education and other activities in the schools and the community. Therefore, there was a need to target strategies and activities, as well as a need for population-wide education. The Island also needed baseline information to understand the reality of Palau for the health of its children. This could be looked at as a future cost containment measure for the island, and as a qualifier for longer and healthy life instead of the sickly life of the adults in Palau at present.

The program objectives were to identify children with health and psychosocial problems and those in the cycle of substance use and abuse, and to provide timely and appropriate interventions or referral. Ms. Berry stated that the objectives of today's presentation were to look at the information obtained from that program, to measure the burden of overweight among schoolchildren, to determine associations between overweight and risk factors like physical activity, eating pattern, and ethnicity, and to determine the relationship of overweight among children and health/social outcomes like hypertension, depression, being bullied, and academic performance. These objectives were introduced, because the hardest thing while conducting research was to get the buy-in from the school leadership. The common opinion in Palau is that schools are academic institutions. They don't have many things to do with health issues. However, the researchers wanted to communicate to the schools that academic performance was also a determinant of health risk factors.

The information came from the screening tool that was designed in 2004 for the program. The sampled children for this study were in 3rd, 5th, 7th, 9th, and 11th grades. Since then, 1st graders have also been included. The definitions used for weight measurements and BMI came from CDC and Prevention's 2000 Growth Charts. In the US, children's weight problems are given in percentile and defined as underweight for less than 5th percentile, healthy weight between 5th and 85th percentile, at-risk-of-overweight for 85th to 95th percentile, and overweight for over 95th percentile. The classification for hypertension also followed standards set by the National High Blood Pressure Education Program Working Group based in the US. Normal blood pressure was less than 90th percentile, pre-hypertension from 90th to 95th percentile, stage 1 hypertension from 95th to 99th percentile, and stage 2 hypertension from over 99th percentile. Data collection was based on face to face interviews. Physical examination of the children was also conducted, including weight measurement, blood pressure measurement, and lab work for urine analysis. The analyses conducted were prevalence, crude odds ratio, and logistics regression.

The screening was administered in 24 schools in Palau, both government and private. Children for this project had the same gender profile as Palau's, which is a little bit more male than female. In terms of ethnicity, 91-92% were Palauans, and the rest were from other ethnic groups.

The result showed a reduction of overweight from 16.3% in 2006 to 13.4% in 2013. In obesity, there was about 0.5% increase, which means that 0.5% of the children who were overweight in 2006 became obese by 2013.

Regarding physical activity, in 2006 the screening tool had self-reported physical activity response questions. However, in 2010 these questions were changed to a more rigid form. Hence, a child who reported light physical activity or physical inactivity was further asked questions to determine whether the child was really physically active or not. The definition of vigorous, moderate, and light physical activities came from CDC definitions.

The school health screening program have also included a 24-hour diet recall by the child. Fruit and vegetable intake was measured at 5.2% in 2006, which increased to 14.7% in 2010. This was important, because at the start of the study the researchers knew that fiber intake of people in Palau was very low. With regard to the prevalence of hypertension in these children, in 2006 stage 1 and 2 hypertension was observed in 18.7% and 2.7% of the children, respectively. However, in 2013 stage 2 hypertension disappeared, and only a small number of stage 1 hypertension cases were observed.

With regard to psychosocial issues, most of the issues that had been observed to be highly prevalent in 2006 improved by 2013, except for the number of children talking to counselors, and children who felt they needed help in dealing with their psychosocial issues. This meant the children were realizing their problems and also knew they could talk to people when they needed help. There was also a sharp decrease in 2013 compared to 2006 in the level of other factors such as a 3% decrease in the number of children having grade problems, and an 11% reduction in the number of children being bullied at school.

Turning to inferential analysis, Ms. Berry stated that ethnicity was not an issue in Palau, and children from all ethnic background had equal chance of developing an issue. Sedentary lifestyle or lack of physical activity was the greatest risk factor for obesity. Additionally, eating pattern was an issue in 2006, but not in 2013. Eating pattern was one of those risk factors which have improved a lot in the last 7-8 years. Also, children in Palau were three to four times more at risk for overweight if they were not physically active compared to any other thing. Hence, Ms. Berry inferred that targeting physical activity in Palau would be one good thing to reduce problems of obesity and overweight.

The researchers also looked at the relationship between physical activity and overweight. In 2006, physical activity was an issue and it continues to be an issue. The children were twice at risk for overweight if they were not physically active, and this could be also true for other countries. Ms. Berry felt this was a problem which could be changed by adopting health promotion legislation in the schools. However, political parties were not interested in supporting such legislation. As for the eating habits, the eating pattern of the children was okay with 15% of their diet being fruits and vegetables and the rest being carbohydrates, fats, proteins, and others. Hence, increasing physical activity in schools and in the community could have a more positive relationship with lowering down BMI in the Island's children population.

Every child in Palau loved eating and hence their risk for obesity was the same. Showing odds ratio for three contributing factors, she pointed out that for overweight and hypertension the odds ratio was 0.000. She also noted, that during the health screening blood pressure was automatically measured for any child who was screened to be overweight or obese. Those children in school who were overweight were found to be more at risk for bullying than their non-overweight peers. Similarly, children who were overweight or obese were more depressed than their non-overweight peers. However, this was not a risk factor for poor academic performance.

In conclusion, Ms. Berry showed a summary table of crude and adjusted PORs of selected health and psycho-social outcomes of overweight among children comparing 2006 and 2013 values.

Lecture 1: Palau Study and STEPS Profile

NCD Risk Factors in Palau

Dr. Chifa Chiang

Dr. Chiang began his presentation by stating that he would be providing some figures about the joint study project of Nagoya University, Osaka University, the Ministry of Health of Palau, and the USA.

Palau was not as far from Japan as some people thought. Also, the Palauan islands were quite close to the Philippines. The estimated Palau population was only 21000 since it was a small island country. Something special about the population was that there were large numbers of foreigners, especially Filipinos. One data estimated that close to 20% of the Filipinos were living in Palau, most of them migrant workers who came from the Philippines after the 1990s.

Regarding non-communicable diseases in Palau, there was no previous survey to provide a comprehensive data. Hence, the WHO and Japan conducted a joint project to provide some useful information on the Palauan population. Explaining about the STEPS program, Dr. Chiang stated that STEPS was a tool from the WHO, which had three basic components; behavioral, physical measures, and biochemical tests. It is a standardized survey for eight key NCD indicators.

Dr. Chiang explained that previous surveys had failed to provide a comprehensive data on Palau, so this project was launched. It was also called as Palau National STEPS. The sample size consisted of 50:50 men and women from the target population aged 25 to 64 years. In the behavioral component the use of betel nut and tobacco was surveyed. A big proportion of people in Palau chewed betel nut with tobacco. Betel nut itself was a problem, but when people added tobacco to it, it became a bigger NCD risk factor. There was another survey done, a joint project between Japan and Palau to focus on the younger age groups from 18 to 24. The methodology used was a modified WHO STEPS Instrument. The survey was not conducted nationwide, but it covered a big proportion of the young people in Palau.

Pointing to the WHO STEPS data of the 25 to 64 age group, Dr. Chiang stated it was difficult to focus on any one number as all data showed high prevalence of NCD risk factors. It showed that the majority of the people were overweight with stage 2 hypertension in higher than 20% of the sample. This meant a health situation crisis in Palau. Fasting glucose above 126 mg/dL were found in more than 20% of the sample. However, an interesting find was that smoking tobacco was 25% only, but tobacco use including chewing was almost 60%.

The ethnic background risk factors for the 25-64 age group showed that not only Palauan but other nationalities were equally at risk for NCDs. Many of the migrant workers living in Palau, especially Filipinos, came to Palau to find a job. The data showed something different between Palauans and Filipinos. Overweight/obesity was higher in Palauans compared to Filipinos. The same was true for hypertension. This meant being a Palauan itself was a risk factor. However, tobacco use data revealed that while most Filipinos smoked tobacco cigarettes, 70% of the Palauans preferred both chewing and smoking tobacco.

Next, analyzing the younger generation between 18 and 24 years showed that overweight/obesity was present. However, hypertension showed a marked gender difference with only 1.7% of females having hypertension compared to 17.6% of males, which could not be explained. Dr. Chiang added that graduate students at Osaka and Nagoya Universities were having a discussion about the data analysis, and the audience could join that discussion. As for tobacco, this young group was using more tobacco than the WHO STEPS survey groups. This implied young people preferred smoking, maybe because chewing made their teeth look red and dirty. The fruit and vegetable intake was also low among young people.

Combining the two surveys to make it into one 18 to 64 years age group showed that higher age groups had higher prevalence of each risk factors, with tobacco use being a big problem for all age group. Therefore, currently steps are being taken, for tobacco control was not effective at all. People started smoking or using tobacco at a young age. One thing to remember about the combined group was that in the 25 to 64 age group around 20% were Filipinos, while in the 18 to 24 age group not many were Filipinos. The data also showed that most people in other Pacific Islands were also chewing tobacco.

Next, Dr. Chiang introduced the data for the Pacific Islands, since the Pacific Islands were a huge family and their genetic background factors could be close. The Pacific Islands were mostly small countries with small population and limited resources. To give a better comparison among the Islands, Papua New Guinea (PNG) was also included, though it was not from that region. Interestingly, the data showed that all other islands had high prevalence of obesity and hypertension, excluding PNG. Dr. Chiang also remarked that there were not many surveys of the Pacific Islands covering the young population, and while for Palau the young age group surveyed was 18 to 24, for other islands it was the 15 to 24 age group.

In conclusion, Dr. Chiang showed some of the discussion points based on the findings of the prevalence data. This included obesity, eating pattern, and other factors which could be blamed for obesity. Perhaps Palauans and other Pacific islanders easily gained weight. Other major worries were the high prevalence of hypertension, undiagnosed hypertension, and diabetes. Many people were not aware of their hypertension or diabetes, and hence failed to manage their blood pressure or blood glucose. Another important discussion point was the chewing of betel nut, which was in fact a cultural issue. Close to 100% of the people chewed betel nut adding tobacco to it. As for the tobacco control in Palau, there was only some commercial advertisement ban from the government side, but to be effective, Palau needed a very different tobacco control.

Question and Answer Session

Question #1
Mami Wakabayashi wanted to know how Ms. Berry chose the 24 schools for the health screening survey in Palau, since Palau has many remote areas where schools are difficult to access. Also, these remote areas might have different health situations. She also asked whether there were different health trends among the 24 schools.

Ms. Berry replied that the 24 schools that were part of the study covered all the schools in Palau, including private and public schools, and schools from the remote islands as well as from the central part of Palau. Regarding the differences among the schools, the schools on remote islands, especially Peleliu, Angaur, and Kayangel, had to be accessed by boats, and those schools tended to have better health profile than the schools in the center. Also, the schools that were in the north of Palau had better profile during the initial health screening in 2006-2007, when they didn't have roads. However, in the last 7-8 years with the recent opening of roads their profiles were getting much closer to the schools on the central islands. This meant stores and goods were becoming more accessible to these schools in the outlying areas.

Question #2
Mami Wakabayashi asked Dr. Chiang about the issue of tobacco chewing. In Palau, tobacco chewing was everywhere, since betel nuts were easily accessible. In relation to the tobacco access of the young population there was a very stringent law in Palau, but young people still found ways to get it, since the law was not enforced strongly.

Dr. Chifa Chiang replied that people did buy betel nuts everywhere, but it was in higher percentage in the Palauan Islands. It was sold everywhere, including small shops, and it was relatively cheap. Also, the problem with betel nut chewing was that it was an acceptable cultural behavior, even in the government's perception.

Dr. Chifa explained that betel nut was found not only in the Palau region, but also from South Asia to the South Pacific Islands. It was country specific, and Chinese were not familiar with betel nuts since it was limited to the South Asian region. The Betel nut is a small-sized fruit similar to coconut. Some people chew it, while others combine it with a variety of things. In Palau, people combined it with tobacco, but in Bangladesh they had different practices.

Question #3
Md Khalequz Zaman asked how the prevalence data of NCD risk factors in young people from 18 to 24 showed that current tobacco use was 79.9% for males and 61% for females, but for the 25 to 64 age group it decreased to 59% and 58%, respectively.

Dr. Chifa answered his understanding was that some of the people quit chewing tobacco later on. In the 18 to 24 age group 60% were college students, who do not think too much about their health when they are young. However, people started to chew tobacco from a very young age in school. This was a more important issue to think about.

Question #4
Yonghua Hu asked Ms. Berry if elderly people were just chewing betel nuts, while the younger generation was adding cigarette to it. He guessed this might be the reason why the younger generation used more tobacco than the older generation.

Ms. Berry Watson replied there was some truth in that. The difference in the use pattern was that as one got older, one tended to have more health problems, and thus cut down on cigarette use, but in younger years, kids were using them more. These kids were also changing the way they used the betel nut, removing the betel leaves for esthetic reasons and mixing tobacco, lime, and betel nut together. Hence, there would be some changes in the disease pattern of betel nut use in the future, which needed to be monitored over the years.

Question #5
Dr. Sohel Reza Choudhury commented that although cardiovascular risk factor levels were high in Palau, the life expectancy in both men and women was quite high at 69 years in men and 76 years in women compared to other low-income countries. He wondered, if it was because the body's physiology had adapted to the unfavorable risks. As a result, what was unfavorable for others may not be unfavorable for Palauans. He also wondered about the quality of life in Palau, and if there were premature deaths from cardiovascular disease occurring at the age of 40-50, or people were having heart attack beyond 70 or 75 years.

Ms. Berry responded that Dr. Chiang's data were official data based on the findings of 2005. However, another mini-census done in 2012 showed that life expectancy had drastically lowered with male life expectancy being in the late 50s and female in 60s. Hence, in just about 15 years, the life expectancy of Palau had drastically reduced. In the past, the Palauan officials had not paid attention to this fact. In 2007, the past minister of health and Ms Berry officiated some of this life expectancy data, which was a real eye-opener for the officials, too.

Question #6
Yonghua Hu wanted to know whether a dietary survey was done in Palau, since Dr. Chiang's data revealed high prevalence of obesity, nearly 50%, in Palau. For the common people in the region this could be because either their food intake was too much, or their physical activity was low.

Dr. Chiang replied he does not have much information about dietary intake. However, some relevant papers on the dietary pattern in Palau had concluded that high prevalence of obesity in Palau was due to high carbohydrate intake. Additionally, Professor Iso concurred that probably there was no population-based nutritional data in Palau.

Question #7
Professor Peiyu Wang remarked that in Palau the prevalence of NCD risk factors were quite high; obesity, hypertension, and diabetes. He wanted to know the death rate of coronary heart disease, stroke, and other cardiovascular diseases in Palau, so it could be compared with other countries' data.

Ms. Berry replied that the five leading causes of death in Palau were related to NCD, including cancer. Dr. Chiang added that he did not have the exact number, but stated that around 70% of the deaths were NCD-related, with cardiovascular disease death at 24%, cancer at 21%, respiratory disease at 12%, and diabetes at 10%.

Question #8
Masayuki Teramoto asked Ms. Berry about the difficulty in getting the buy-in from school leaders for the screening survey, and the incentives given or steps taken by the researchers to overcome that difficulty.

Ms. Berry replied that Sherilyn Madraisau's presentation would provide an answer to that question. However, they made sure that the schools were part of the discussion from the beginning. The officials ensured that the schools were part of the review of the tools designed for implementation in the schools. Additionally, the results from the health screening were communicated with the schools every year. Also, when the screening was completed and the data was analyzed, the researchers went back to the school and its parent teacher association to present to them their school profile, and to show them how it compared with the national data in Palau. Besides, children who were found to have risk factors were given appointments and their parents were provided further information. Hence, the schools were always part of the communication and the collaboration throughout the whole period.

Lecture 2: NCD and Prevention: China's Fangshan Cohort Study

Fangshan Cohort Study on Cardiovascular Disease, Beijing, China

Professor Peiyu Wang

Professor Wang informed the gathering that his talk was on the cohort study of cardiovascular disease performed in Fangshan, in the suburb of Beijing.

The Fangshan study had three studies; the first was a population-based study, or the Fangshan cohort study. The second was a familial-based study, which was different than other studies, and the third study was the international collaborative study between Japan and Palau. Professor Wang stated he would first introduce the population study of Fangshan and then the collaborative study with Japan and Palau.

Starting with some general information of NCDs in China, he showed the latest data on the leading causes of deaths in China in 2011. Non-communicable diseases accounted for over 80% of the disease burden and mortality reasons with cancer on the top at 26%, followed by heart disease, mainly coronary heart disease, at nearly 23%, stroke at 21%, and lastly chronic obstructive pulmonary disease, accounting for over 12% of deaths.

Moving to data from the Cardiovascular Center of China in Beijing Fuwai Hospital, Professor Wang informed that this hospital had a center for disease calculations from 1985 onwards to the present. The data showed that stroke and coronary artery disease had increased steadily every year from 1985. Hence, although the Chinese economy was doing well, the situation of non-communicable diseases in China was worrisome to its people.

The incidence of cancer in Beijing was also increasing every year. The National Cancer Registration contained only 5 years of data, but Beijing had over 10 years of cancer statistics. The age-adjusted cancer

incidence in Beijing showed a horrible 2.6 increase in cancer every year compared with the previous year.

According to the CDC China, the non-communicable diseases and risk factor survey began in 2007 and is conducted once in every 3 years. The last survey was done in 2013, however, that data has not been published yet. The data was divided into urban and rural areas because of a big disparity between urban and rural populations in China. The data was also divided between men and women. One thing to note in the data was that the criterion in China for obesity was different. Overweight was when BMI was over 24, and obesity when BMI was over 28. About 36% of the people were overweight in urban areas in China. Also, about 15% were obese in urban areas, whereas in rural areas it was a little lower. The prevalence of hypertension was very high, over 30% in both areas, and the prevalence of diabetes was also over 10% in urban areas. Professor Wang explained that this hypertension percentage was higher compared to the results of other investigations, probably because the survey measured blood pressure by electronic blood pressure monitor and not by mercury.

Next, the data on the prevalence of dyslipidemia in China was shown. Over 50% of the men suffered from high total cholesterol, high LDL, low HDL cholesterol, and high triglyceride. However, women did little better than men in this regard.

One of the major risk factors in men was smoking, over 50% both in urban and rural areas. Although the drinking criteria was different than in other surveys, drinking was still near 10% among men. Regular exercise was about 20% in urban areas and 10% in the countryside, while sitting hours, meaning physical inactivity, was over 3 hours per day.

Looking at the diet in China, vegetable and fruit consumption was good, but red meat intake was every day around 80 grams. Salt intake was about 9 grams, while salad oil was about 50 grams, which was very high. Professor Wang recalled that when he was a university student in China, meat intake was only 15 grams per day and oil intake about 10 grams. Hence, oil and meat intake had increased about five times. Another risk factor in China was stress due to long working hours, low income, and high prices. Hence, the pressure from living in China was very high. Working time in China was about 2000 hours every year, even more than the 1800 hours in Japan.

Because of such background, Professor Wang explained, they were concerned about chronic diseases or NCDs, and hence they designed the cohort study. First, one of the research objectives of the study was to analyze the prevalence, change, treatment, and control of chronic diseases in rural areas. Rural areas lacked data compared to cities. The area chosen for the cohort study was the suburb of Beijing. Secondly, they wanted to explore the genetic and environmental reasons of chronic diseases. Thirdly, the researchers wanted to gather evidence to advice the local government and local hospitals to provide some effective preventive and control strategies.

Showing the basic information of the Fangshan study, Professor Wang introduced the location of the cohort study. The Fangshan district was located in the southeast of Beijing. Fangshan was comprised of different places; some were cities, some were the mixture of city and countryside, and others were countryside. It had eight subdistricts, four towns, and six townlets or villages, covering about 2000 square kilometers. The district covered different kinds of socioeconomic area.

The Fangshan district has a total population of about 1 million, comprising of permanent residents and a transient population. The transient population is about 220,000 people who come to Fangshan to live and work there for several months or years, then go back to their home town. The Fangshan district represents the rural areas in north China. China has over 50 ethnic groups, the majority being Han, which accounts for over 90% of the Chinese people. In the Fangshan district ethnic groups are major ethnic groups. This district was selected, because the population is quite stable with 80% being permanent residents, unlike downtown Beijing, where out of every three people one is from outside Beijing. Regarding the economic situation, Fangshan's rural residents' per capita income was about half of its urban residents' per capita income.

Another advantage of doing a cohort study in Fangshan was the already established three-tier prevention and healthcare network at district level, township level, and village level. Since during the cohort study there was a need for follow-up, this network provided fast follow-up and record-keeping. Also, the district had a high prevalence of cardiovascular disease with over 47% of the people aged 40 and above suffering from hypertension, 3.7% from stroke, and 5.6% from coronary heart disease.

Next, Professor Wang explained that the research objectives of the cohort study were to provide longitudinal epidemiological data on cardiovascular disease risk factors, to provide a disease profile of the rural population of China, and to find effective preventive and control methods to make the disease prevalence stable or decrease.

As for the methods and study design of the baseline survey, the inclusion criterion for target population was local residents over 40 years old, while the exclusion criteria were people with very severe physical/mental diseases and people with very severe health conditions, who could not come to the community hospital. As for the sampling method, stratified, multistage, and cluster-sampling design was used. First, based on geographic location and socioeconomic situation the participants were divided into different groups. Clusters were also used; when the location area was decided, the whole community was selected as a sample because they were relatively easy to survey.

As for the time, place, and sample size, three places were selected; Zhoukoudian, a plain area, then Dashiwo, a mountain area, and Qinglonghu, a hill area. These three areas represented the countryside, the city, and the mixture of city and rural areas. The start year was different in the three selected areas; 2008, 2009, and 2010. The sample size for the cohort study was selected from the total population of 40 years or older. However, Professor Wang added that in the collaborative study with Japan and Palau the sample size selected was 500, only from two areas. This collaborative study started in August 2014 and would end by October this year. The examination part of the baseline survey contained general information such as age, gender, ethnic group, education, occupation, and income. Also, personal medical history as well as family medical history was obtained through questionnaires.

The questionnaire consisted of questions on health knowledge and health behaviors such as smoking, alcohol use, exercise, diet, and sleep, as well as questions on quality of life based on the EQ-5D scale. The demand and utilization of health services was also investigated in the questionnaire. However, Professor Wang remarked that this questionnaire was around 30% different than the questionnaire provided by Professor Iso and Professor Aoyama. In the physical examination portion blood pressure, height, weight, waist and hips circumference, and ECG was examined, while in the biochemical examination portion data on total cholesterol, lipase, glucose, etc. were obtained.

Professor Wang stated that the Fangshan cohort study had follow-up surveys every 2 years after the baseline survey. This follow-up survey also had a full physical examination portion, except for the family history. Regarding the surveillance system, there were three levels; city, town, and community medical center levels. These three levels would record the entire patient situation. The participants would go to the hospital to get their medication or physical examination, and these centers in turn would collect and record the information.

Proceeding to the progress part of the cohort study, Professor Wang explained that the Zhoukoudian and Dashiwo centers included around 6000 people in the study, while Qinglonghu admitted around 7000 people. The total participants accounted for 80% of the total local population.

As for the outcome portion of the cohort study, there were just some primary outcomes, since only the baseline survey and the first follow-up of the study was completed in most of the cases, except for a few places where the second follow-up was also completed. Outcome 1 was obesity and smoking prevalence. The results showed that the prevalence of both smoking and obesity was very high. Overweight for men was 40% and for women 47%, while obesity in men was over 10% and for women near 20%. Professor Wang remarked that this result was different from other places in China, where results for women were

better than for men, unlike in Fangshan. In Fangshan the percentage of current smokers was also very high, even in women. In China, 3% of women were smokers, but in Fangshan this was over 10%.

Outcome 2 was health-related quality of life. This part of the survey investigated chronic diseases such as hypertension, diabetes, cardiovascular disease, and stroke, and their relative risk for five factors; mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Outcome 3 was menopause in relation to cardiovascular disease and its risk factors. The results showed significant differences during the pre- and postmenopausal period in risk factors such as total cholesterol, high blood pressure, and LDL cholesterol. For analyzing the relation of menopause to cardiovascular disease and its risk factors, people 1-2 years, 3-6 years, and over 6 years after menopause were divided into different groups. The odds ratio for coronary heart disease was elevated for post-menopause women. The result for cardiovascular disease was the same, but for stroke there was no significant difference. The last outcome, outcome 4, was about the relationship between menopause and health-related quality of life. The results showed that mobility, self-care, and usual activities were different in ladies after menopause compared with the control group.

Finally, Professor Wang stated that the collaborative study was not completed, so there were no results to present.

Question and Answer Session

Question #1
Professor Hiroshi Yatsuya asked about the reason behind the higher prevalence of obesity in women in the Fangshan area. He also wanted to know if the definition of obesity was BMI above 28.

Professor Wang replied that obesity was indeed defined as BMI above 28, but as for the question about the obesity in women he stated that perhaps Professor Yatsuya, being the first PI of the study, could answer the question himself.

Professor Yonghua Hu reasoned that in Chinese villages most young men were strong since they prepared themselves to go to the city to work, while many women were left behind in the village. Another reason could be that in the past women worked hard in the village, but today they had no work to do, except for watching TV. As a result, they had very little exercise.

Professor Yatsuya thanked Professor Hu for the clarification and explained that he asked the question because Professor Wang had stated that it was strange to find higher prevalence of obesity in women than in men in Fangshan. He further stated that in some parts of the world obesity was seen in more women than men, although in Japan it was men who were more likely to be obese.

Professor Wang also speculated that in the international survey data men and women were usually in their 20s and 30s, whereas in the Fangshan data they were all above 40, and young women had a strong sense of beauty so they cared about their diet, but perhaps women over 40 years do not care. Professor Atsuko Aoyama agreed with Professor Yatsuya and added that according to the WHO data globally, such as in the Middle Eastern countries and South Asian countries, women are much fatter than men. It could be an East Asian thing, like women's social status, or it could be related to something genetic in Eastern Asia.

Question #2
Professor Aoyama asked if the findings from the sociological study including focus group interviews revealed anything about the reason why women were a bit fatter than men.

Professor Wang replied that he was doing serological analysis of the samples of 2013, but added that some women did mention that their lifestyle changed drastically over the years. Nowadays, they were not doing any kind of work involving physical activity. However, they didn't mention the prevalence and they didn't compare themselves with men. Hence, Professor Wang presumed that less physical

activity could be one of the reasons why in the rural area the prevalence of obesity was higher in women than in men.

Question #3
Professor Md Khalequz Zaman asked what was the definition of 'regular exercise', whether it meant exercise done during work, or in a gym, or doing free-hand exercise. Professor Wang answered that regular exercise meant 30 minutes of exercise at least 3 days a week.

Question #4
Professor Sohel asked two questions. The first one was how did the researchers plan to get the outcome of the cohort study; whether it was only from the hospitals, or the researchers themselves went to the community to get the outcomes. The second question was about the increased percentage of women smokers in Fangshan. While the national prevalence was 3% for women smokers, the Fangshan cohort study showed 11% women smokers.

Professor Wang stated that there were two ways of getting outcomes. The first way was when the researchers went to do a baseline survey or follow-up survey. However, beyond the survey period the outcome data was gotten through the help of the local healthcare system, since they kept the record of the medical examination. Every individual had a unique number, so when they went to the local community nurse or doctor it was recorded.

Regarding smoking, Professor Wang explained that in China traditionally the countryside's smoking rate was higher than the city's rate. Traditionally, women had the habit of smoking, but recently this rate had decreased. However, in the Fangshan area this smoking rate was higher in women because, first, it is countryside, and second, most of these women were over 40 years old, so they are relatively elderly. But for young women the smoking rate was still lower, at about 3%.

Lecture 3: Thai Cohort Study

Thai Health Risk Transition: A National Cohort Study (2004-2015)

Adrian Sleigh

Professor Sleigh started his presentation explaining the background of the cohort study. The study began about 10 years ago, when the Wellcome Trust encouraged the National Health and Medical Research Council in Australia to support an international health research in public health and there was a big grant issued, which the researchers won. Regarding the subject of the study, they decided to study the process of health-risk transition in Thailand, which was in fact happening throughout the Southeast Asian region. Dr. Sleigh then played a video which introduced the cohort and showed how much and for how long the work had been done.

Professor Sleigh stated that his presentation would reflect on population health transitions driven by NCDs, introduce the Thai cohort study again, and highlight some aspects of NCD in Thailand. The Thai-Australian Partnership began in 2003, was still ongoing, and the research topic was still about the Thai health-risk transition, and about health-risk factors and potential interventions for emerging diseases.

There were three main components to the Thai health risk transition project; first was a study looking back at the last 50 years through historical records in Thailand to see what had happened to health patterns, society, and social norms during that period. The second component was the cohort study itself, which started in 2005. The cohort had some retrospective data embedded within it. This retrospective exposure was then analyzed for its impact on diabetes or hypertension. The cohort study also has a follow-up component, which has been ongoing for the last 8 years. The second, or the 8-year follow-up, was recently completed and the data was made available last week. The cohort began with 87,151 people. There was some attrition, but it still has 40,000 people at the 8th year mark. This cohort study was

inspired by other famous cohorts such as the Framingham cohort in Massachusetts, and the Nurses' Health Study from Harvard. This cohort has been much more successful than it was hoped initially. The third component of the project was a capacity building component.

An Eco-Social Multilevel model was followed, thinking about what was driving the health transition in Thailand. There were external factors such as trade policy and the World Trade Organization, which constrained markets that impose food systems. There were upstream factors such as the environment and the infrastructure, midstream factors such as the social organization, and proximal factors such as personal behavior.

Transition theories existed since the early 1920s, when Notestein, and later on Thompson, theorized that demographic transition was a consequence of people gaining confidence in the survival of their children, and therefore limiting their fertility after observing infant mortality fall. This is called a demographic transition. Omran in the early 1970s put forward theories regarding how the composition of deaths would change as the population underwent transition, with a period of receding epidemics and receding infectious diseases to emerging chronic degenerative diseases, and that was indeed being seen today. Jack Caldwell, a very famous demographer from ANU, carried out studies in South Asia, in Kerala, in Sri Lanka, and in West Africa, and drew the conclusion that health transition was the most important transition. The external system and the health system itself was able to respond in ways which couldn't be done 100 years ago, and that was an important part of the transition, but another important part was the internal change that people experience as they embrace scientific explanations for illness and arrange their behavior accordingly such as fighting against illness, consulting with doctors, and acting autonomously within the family. That was Caldwell's theory of health transition.

With regard to Thailand's demographic transition, the stage where the cohort study began was already marked by the most dramatic fall in birthrate ever recorded, from 1965 to 1980, once family planning and primary health care became available. The death rate also had already fallen from the time that the census began in the early 1900s. This transition also showed that the population was going to stabilize at around 70 million.

The causes of death in the last 50 years have changed a lot with child diseases, child infections, malaria, pneumonia, TB, and diarrhea being the major causes of death in the 50s and 60s, but in the 70s and 80s accidents and violence, heart disease, nutritional deficits, and cancers became permanent. In the 90s, HIV and cardiovascular deaths appeared, and injury became a problem.

The Thai cohort study was started in 2005, but is different than the Framingham study. The Framingham study was a small cohort based in one location, and was therefore limited and intensive. Hence the study was able to carry out intense investigations. In comparison, the Thai cohort study is based on a large number of people, and self-reported questionnaire-based data from university students, who are thought to be good informants.

The Thai cohort study baseline survey broke all the rules by using a 20-page questionnaire with a nearly 50% response rate, instead of a standard full-page questionnaire with a 15-20% response rate. Therefore, the cohort study had a lot of information, which would require a lot of time to analyze it. The questionnaire included family structure, details about work, health services, foregone health services, health insurance, disease and injury in the last 12 months, self-reported health, social and psychological factors, environment, food and physical activity, tobacco, alcohol, and transport. In 2009, a 4-year follow-up was conducted, which was successful. By this time, a fair proportion of the cohort had left the university, but cooperated with the study by using all sorts of tools, including extensive telephoning and investigation. In 2013, the study completed the 8-year follow-up and got a 70% success rate. The baseline year was 2005, and from 2005 until now cohort mortality is being tracked, and that can be done forever now because of the unique citizen's ID number for every cohort member. The vital statistics were registered according to the citizen's ID number, and the Ministry of Interior had committed to report to the researchers if any of the cohort members die, including the cause of their death. Hence, all cause and cause-specific mortality investigation could be done on the cohort, and since there was