โครงการสำรวจสุขภาพประชาชนไทยโดยการตรวจร่างกาย ครั้งที่ 6 พ.ศ. 2562-2563

ศ. นพ. วิชัย เอกพลากร และคณะฯ

ภาควิชาเวชศาสตร์ชุมชน คณะแพทยศาสตร์ รพ. รามาธิบดี

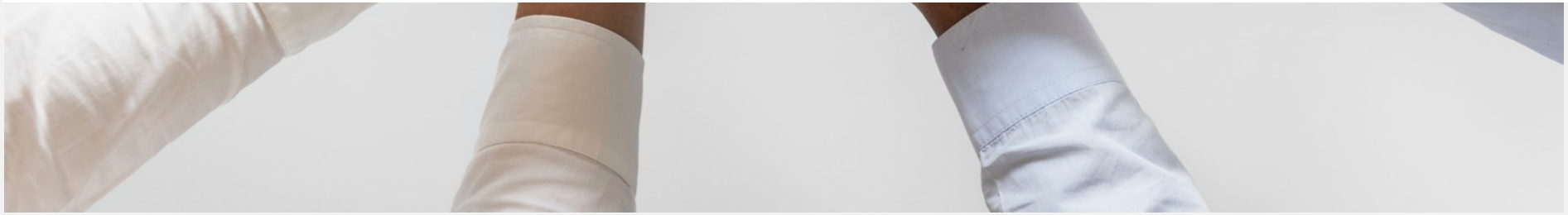
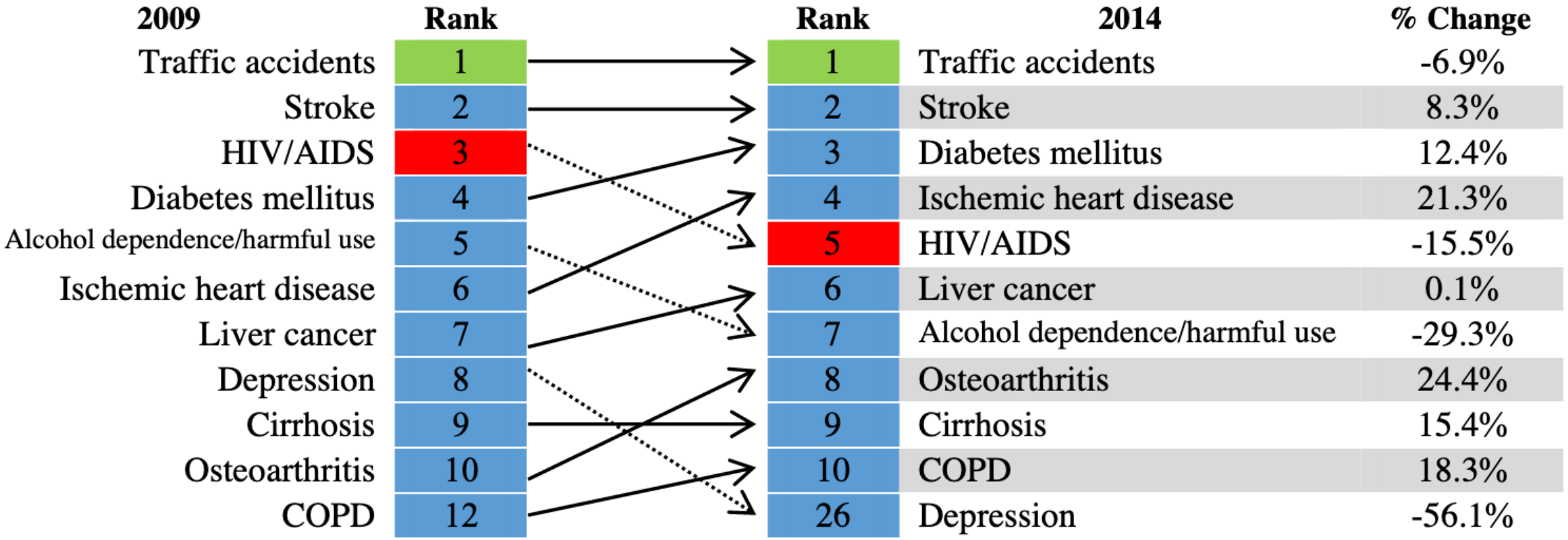


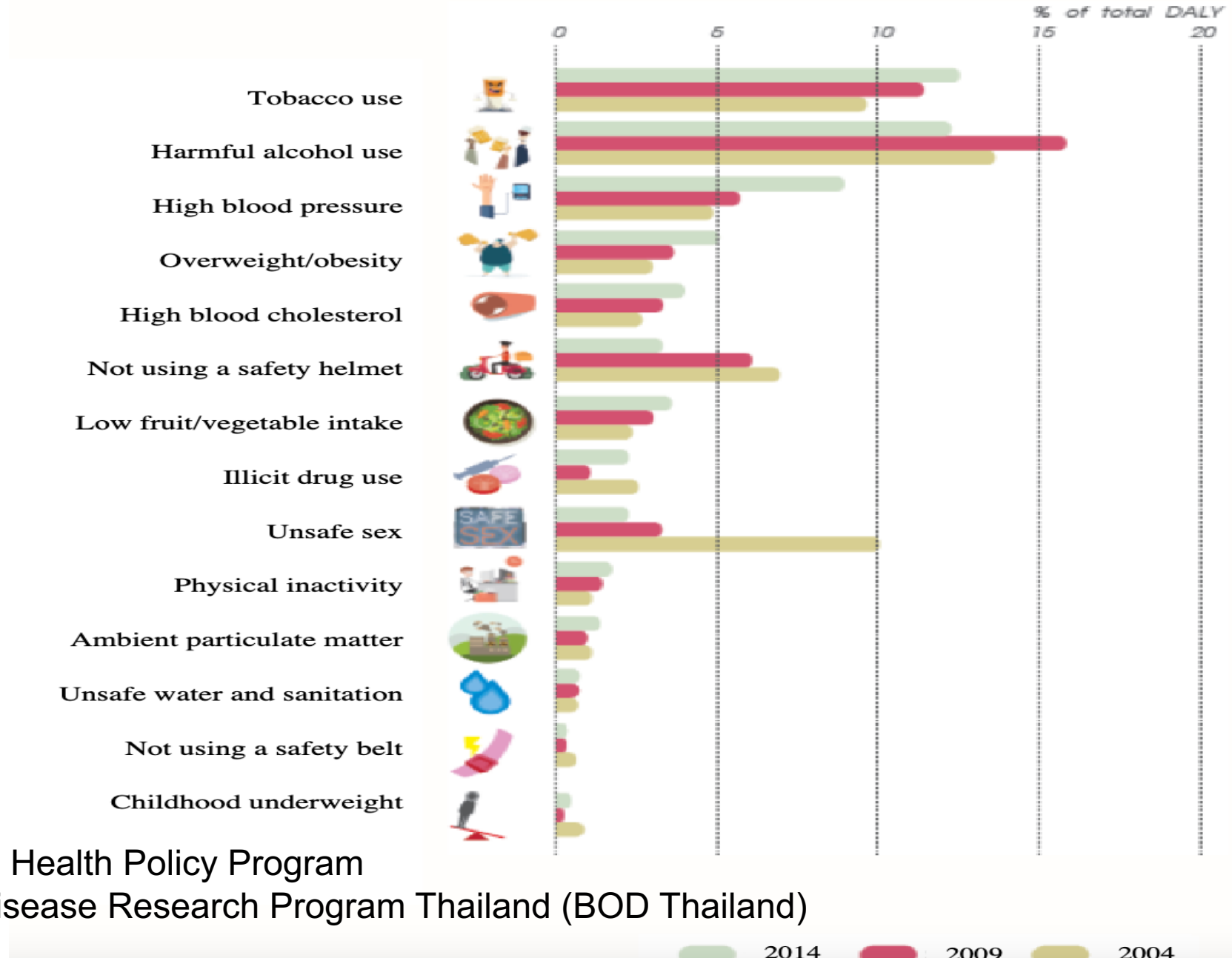
Figure 15 : DALY in 2009 and 2014



2009	Rank	Rank	2014	% Change
Traffic accidents	1	1	Traffic accidents	-6.9%
Stroke	2	2	Stroke	8.3%
HIV/AIDS	3	3	Diabetes mellitus	12.4%
Diabetes mellitus	4	4	Ischemic heart disease	21.3%
Alcohol dependence/harmful use	5	5	HIV/AIDS	-15.5%
Ischemic heart disease	6	6	Liver cancer	0.1%
Liver cancer	7	7	Alcohol dependence/harmful use	-29.3%
Depression	8	8	Osteoarthritis	24.4%
Cirrhosis	9	9	Cirrhosis	15.4%
Osteoarthritis	10	10	COPD	18.3%
COPD	12	26	Depression	-56.1%

International Health Policy Program Foundation
Burden of Disease and Injury of Thai Population in 20

Figure 7 BOD of the Thai population in 2004, 2009, and 2014

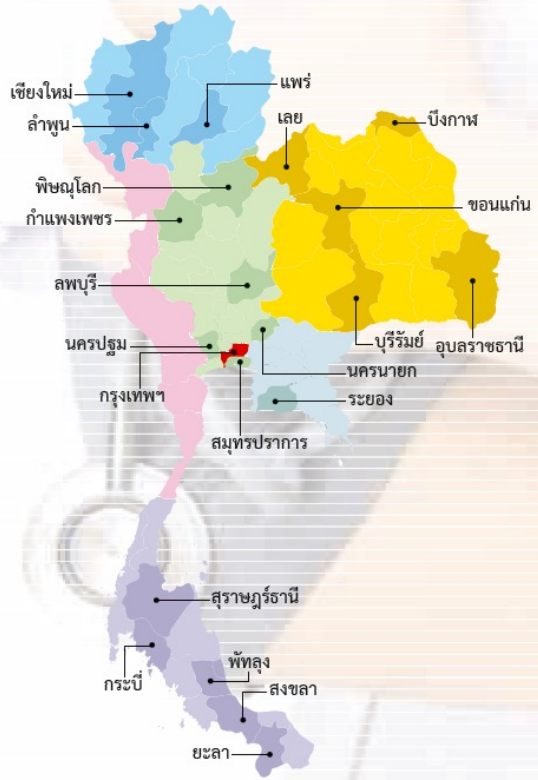


International Health Policy Program
Burden of Disease Research Program Thailand (BOD Thailand)

สสก.
การสำรวจสุขภาพประชาชนไทย

โครงการสำรวจสุขภาพประชาชนไทย โดยการสัมภาษณ์และตรวจร่างกาย

ครั้งที่ 6 พ.ศ. 2562-2563



ความเป็นมาของโครงการ

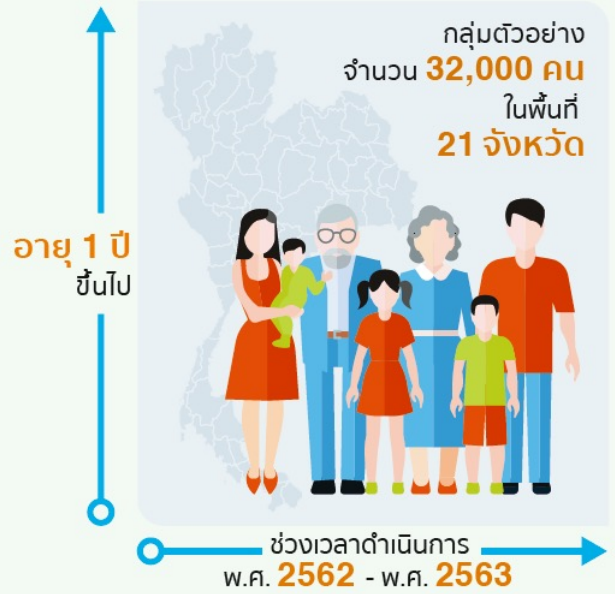
ประเทศไทยมีการสำรวจสภาวะสุขภาพประชาชนโดยการตรวจร่างกายในระดับประเทศมาตั้งแต่ปี พ.ศ. 2535 และต่อมาในปี 2540, 2547, 2552 และ 2557 มีการสัมภาษณ์ ตรวจร่างกาย ตรวจเลือด และปัสสาวะทางห้องปฏิบัติการ เพื่อให้ได้ข้อมูลสถานะสุขภาพของประชาชน ขนาดของปัญหาสุขภาพที่สำคัญ และปัจจัยเสี่ยงของปัญหาสุขภาพในประเทศไทยจำแนกตามพื้นที่ต่าง ๆ ของประเทศรวมทั้งตามลักษณะทางประชากรที่สัมพันธ์ต่อปัญหาสุขภาพ เช่น เพศ อายุ เป็นต้น ซึ่งข้อมูลเหล่านี้จะมีประโยชน์อย่างยิ่งต่อการพัฒนาและวางแผนสาธารณสุขของประเทศ นอกจากนี้ผู้รับการตรวจยังได้ทราบภาวะสุขภาพของตนเองอีกด้วย

วัตถุประสงค์ของการสำรวจ

1. เพื่อทราบความชุกของโรคที่สำคัญ ภาวะการเจ็บป่วย ภาวะความพิการ ตลอดจนปัจจัยเสี่ยงต่อสุขภาพของประชาชน
2. แสดงสภาวะสุขภาพของประชาชนไทยในระดับประเทศและภาคเป็นรายหมวด อายุ เพศ และเขตการปกครอง
3. แสดงแนวโน้มความชุกของปัจจัยเสี่ยง และโรคต่อเนื่องจากการสำรวจครั้งก่อน
4. ใช้ข้อมูลเหล่านี้เป็นประโยชน์และเป็นพื้นฐานสำหรับการติดตามระยะยาว
5. เป็นระบบข้อมูลสำหรับใช้ในการวางแผนป้องกันและควบคุมโรคในระดับประเทศ

กลุ่มอายุที่สำรวจ

โครงการสำรวจสุขภาพประชาชนไทยโดยการตรวจร่างกาย ครั้งที่ 6 (พ.ศ. 2562-2563) นี้จะดำเนินการสำรวจในกลุ่มตัวอย่าง 21 จังหวัด เพศชายและหญิงอายุตั้งแต่ 1 ปีขึ้นไป เพื่อครอบคลุมปัญหาสุขภาพในภาพรวมของประชาชนไทยทุกเพศและทุกกลุ่มอายุ จำนวน 32,000 คน ระยะเวลาดำเนินการภาคสนามตั้งแต่เดือนสิงหาคม 2562 เป็นต้นไป




การประชุมอบรมเชิงปฏิบัติการ
โครงการสัตวแพทย์ประชาชนไทย โดยการสงเคราะห์ต่างกาย
ครั้งที่ 6 (NHES VI)
ระหว่างวันที่ 3-4 สิงหาคม พ.ศ. 2562
ณ โรงแรมเอเชีย กรุงเทพฯ


การประชุมอบรมเชิงปฏิบัติการ
ครั้งที่ 6 (NHES VI)

จุดที่ 2 : ลงทะเบียนและเจาะเลือด

จุดที่ 3 : วัดความดันเลือดและชีพจร

ประเด็นสุขภาพที่สำรวจ

สุขภาพเด็กวัย 1-5 ปี และ 6-14 ปี

- **พฤติกรรมสุขภาพ**
  - การกินอาหาร / ผักผลไม้
  - การนอนหลับ / กิจกรรมทางกาย
  - เล่นคอมพิวเตอร์ / การใช้สมาร์ทโฟน
- พัฒนาการทางกาย อารมณ์ จิตใจ สังคม และจริยธรรม
- ภาวะโภชนาการ: ส่วนสูง น้ำหนักตัว ภาวะอ้วน

วัยรุ่น วัยแรงงาน และผู้สูงอายุ (15-59 ปี / 60 ปีขึ้นไป)

- **พฤติกรรมสุขภาพ**
  - การกินอาหาร / ผักผลไม้
  - การสูบบุหรี่ / ดื่มสุรา
  - กิจกรรมทางกาย / การใช้ยา / อาหารเสริม
- **ภาวะสุขภาพ**
  - เบาหวาน ความดันเลือดสูง
  - ภาวะอ้วน ไขมันในเลือดผิดปกติ
  - ประวัติโรคหัวใจ หลอดเลือดสมอง มะเร็ง โรคปอดเรื้อรัง
  - สุขภาพจิต คุณภาพชีวิต
- **สุขภาพผู้สูงอายุ**
  - คัดกรองภาวะสมองเสื่อม ภาวะพึ่งพาการทำกิจวัตรประจำวัน (ADL)
  - การหกล้ม โรคเรื้อรัง ฯลฯ

หน่วยงานที่รับผิดชอบ และเครือข่ายการสำรวจสุขภาพ

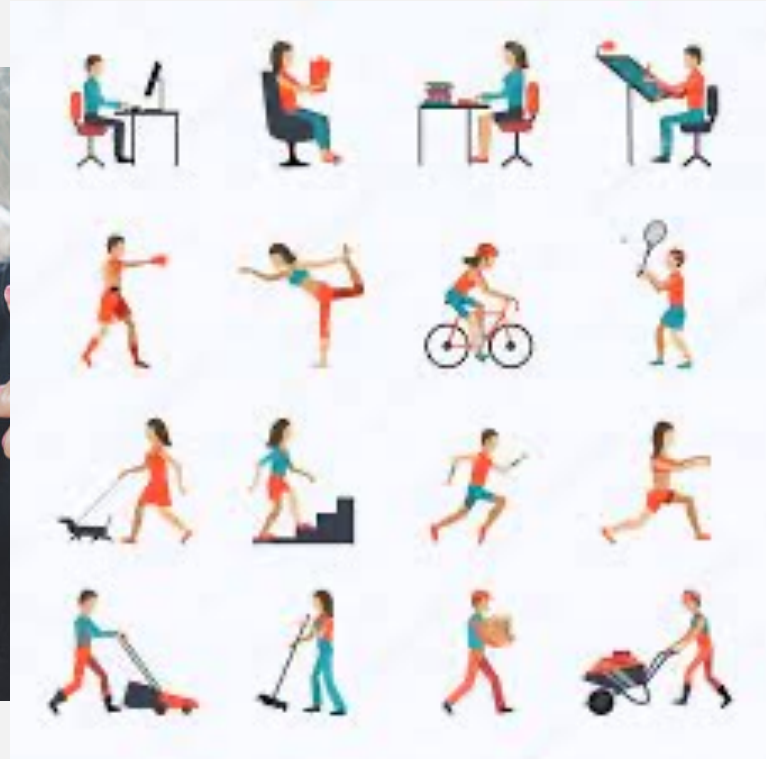
- แผนงานสำรวจสุขภาพประชาชนไทย คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล
- คณะสาธารณสุขศาสตร์ มหาวิทยาลัยเชียงใหม่
- คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น
- คณะแพทยศาสตร์ มหาวิทยาลัยสงขลานครินทร์
- วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย

สนับสนุนโดย : มหาวิทยาลัยมหิดล
กระทรวงสาธารณสุข
สถาบันวิจัยระบบสาธารณสุข

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี
270 ถนนพระราม 6 ราชเทวี กรุงเทพฯ 10400

รายการตรวจสุขภาพ

รายการ	อายุ (ปี)				
	1-5	6-9	10-19	20-59	>=60
1. วัดสัดส่วนร่างกาย	✔	✔	✔	✔	✔
2. วัดความดันเลือด			✔	✔	✔
3. พัฒนาการทางอารมณ์		✔	✔		
4. ตรวจระดับน้ำตาลในเลือด (FPG)			✔	✔	✔
5. ตรวจระดับไขมันในเลือด (Cholesterol, Triglyceride LDL, HDL)			✔	✔	✔
6. ตรวจการทำงานของตับและไต (Creatinine)			✔	✔	✔
7. ตรวจภาวะเลือดจาง (CBC, Hb, Hct, Red cell morphology)				✔	✔
8. ตรวจปัสสาวะ (โปรตีน, โซเดียม)	✔	✔	✔	✔	✔
9. ทดสอบความแข็งแรงของกล้ามเนื้อ				✔	✔
10. ทดสอบสายตา					✔
11. คัดกรองภาวะสมองเสื่อม					✔
12. ทดสอบการเดิน					✔
13. สอบถามประวัติสุขภาพ ● การบริโภคอาหาร ● การออกกำลังกาย ● ประวัติการป่วย	✔	✔	✔	✔	✔

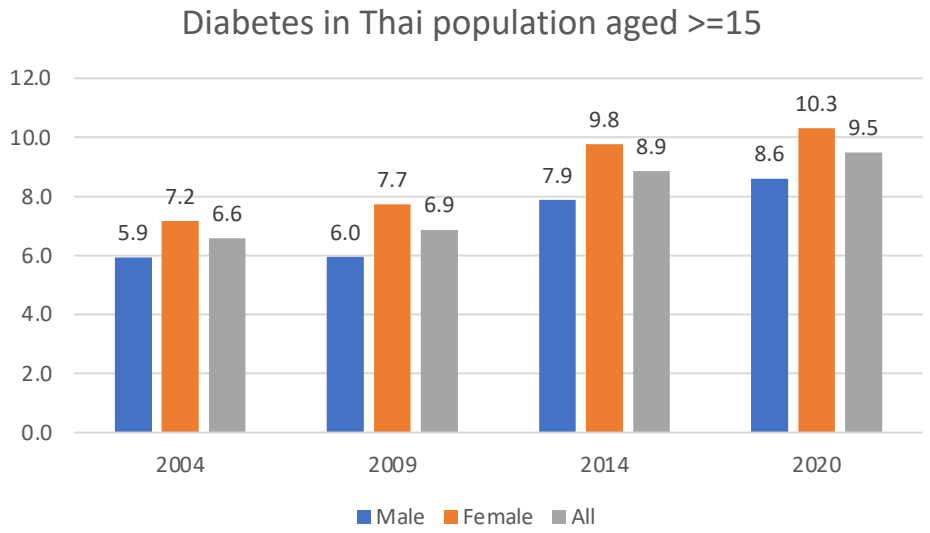


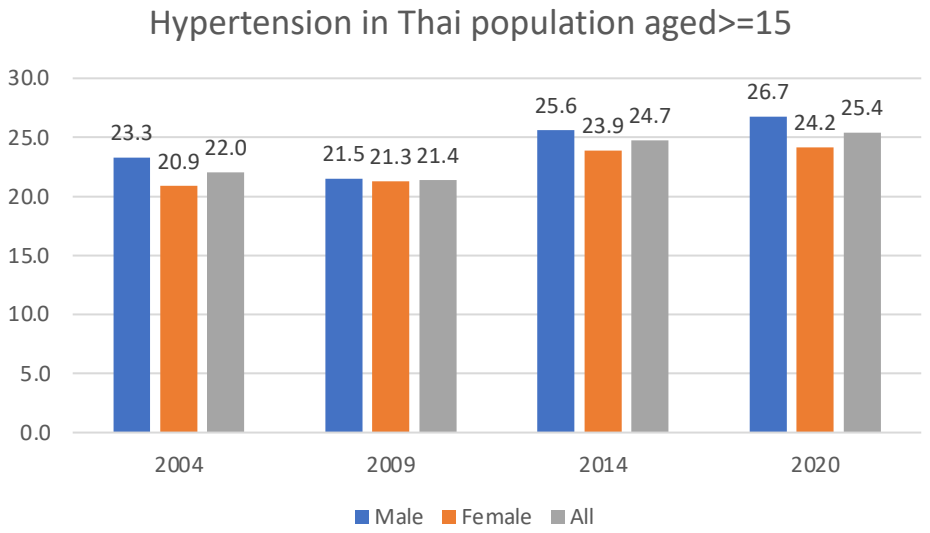

GLEN ROSSIE
Glenlogie

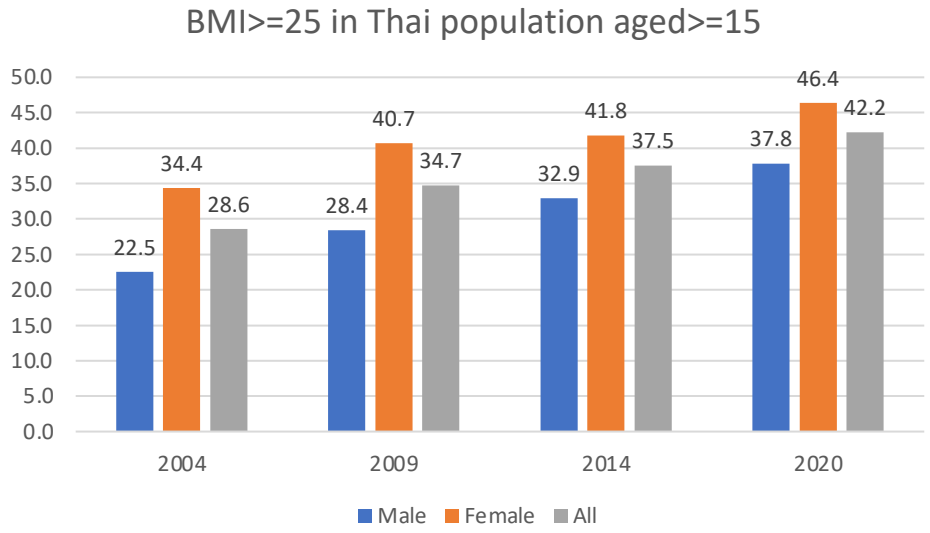

SINGHA
Light
SINGHA
LAGER BEER
Heineken
PREMIUM QUALITY
PAULANER
Chang
CLASSIC
LEO

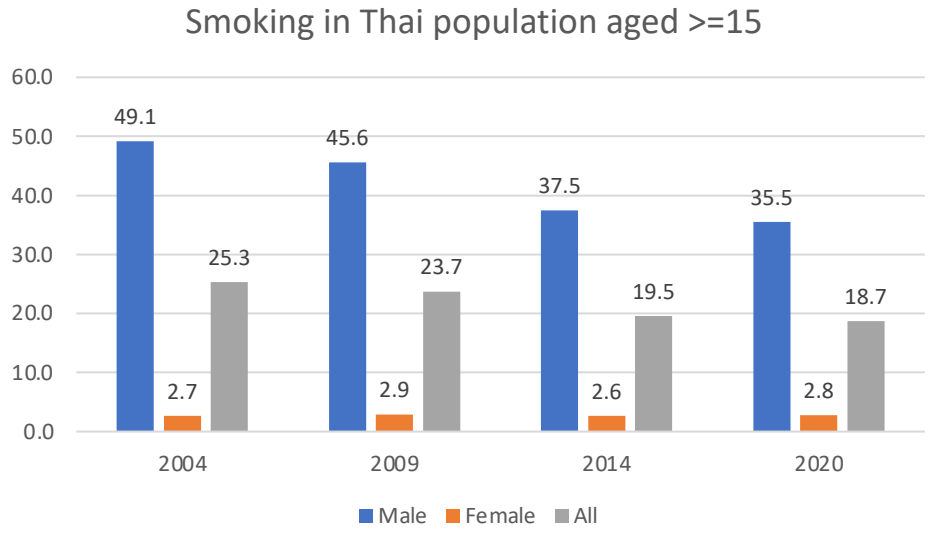
ข้อ

Prevalence and trends









เด็ก

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BMC Public Health

RESEARCH ARTICLE Open Access

Metabolic syndrome in Thai adolescents and associated factors: the Thai National Health Examination Survey V (NHES V)

Sirinapa Siwarom[1], Wichai Aekplakorn[2*], Kwanchai Pirojsakul[1], Witchuri Paksi[1], Pattapong Kessomboon[3], Nareemarn Neelapaichit[4], Suwat Chariyalertsak[5], Sawitri Assanangkornchai[6] and Surasak Taneepanichskul[7]

Abstract

Background: Presence of metabolic syndrome (MetS) in early life may influence cardiovascular outcome later in adulthood. There is limited data regarding MetS among Thai adolescents. This study aimed to estimate the prevalence of MetS and related factors in Thai adolescents.

Methods: Data on MetS components of 1934 Thai adolescents aged 10–16 years were obtained from the 5th National Health Examination Survey. Age at first screen time exposure, duration of screen time, frequency of food intake and physical activities were collected from interviews. MetS was defined according to 3 definitions: International Diabetes Federation (IDF), Cook's, and de Ferranti's.

Results: The prevalence of MetS was 4.1% by IDF, 8.0% by Cook's, and 16.8% by de Ferranti's definition. The overall prevalence was higher in male (19.0%) than female adolescents (15.3%). The most common MetS components composition among Thai adolescents was high waist circumference with high serum triglyceride and low HDL-cholesterol (40.0% for IDF, 22.6% for Cook's and 43.5% for de Ferranti's definition). Exposure to screen media during the first 2 years of life had a 1.3- fold increased odds of MetS by 1 out of 3 definitions (OR 1.30, 95% CI. 1.01–1.68). Duration of physical activity associated with decreased odds of MetS by Cook's definition (OR 0.96, 95% CI. 0.92–0.99).

Conclusions: The prevalence of MetS among Thai adolescents was higher than previously reported by other studies. Screen media exposure during the first 2 years of life should be discouraged and measures to promote physical activity among children and adolescents should be strengthen.

Keywords: Metabolic syndrome, Adolescents, Prevalence, Risk factors

Table 3 Risk factors and their association with metabolic syndrome

Factor	Odds ratio (95% CI)			
	MetS by any 1 of 3 definitions	MetS by IDF definition	MetS by Cook's definition	MetS by de Ferranti's definition
Age	**0.88**[a] (0.82–0.95)	**0.95** (0.83–1.09)	**0.91** (0.83–1.01)	**0.89**[a] (0.83–0.95)
Male sex	**1.44** (1.11–1.87)	**1.59** (0.95–2.65)	**1.46**[a] (1.01–2.10)	**1.44**[a] (1.11–1.87)
Screen exposure at age ≤ 2 y	**1.30**[a] (1.01–1.68)	**1.18** (0.72–1.94)	**1.29** (0.90–1.85)	**1.27** (0.98–1.65)
Total screen time (h/wk)	**1.00** (0.99–1.00)	**1.00** (0.99–1.02)	**0.99** (0.98–1.00)	**1.00** (0.99–1.00)
Physical activity time (h/wk)	**0.98** (0.96–1.00)	**0.96**[a] (0.92–0.99)	**0.98** (0.95–1.01)	**0.98** (0.97–1.00)
Frequency of food intake (> 3 vs ≤3 times/wk)				
- Sweetened milk	**0.84** (0.64–1.12)	**0.86** (0.49–1.48)	**0.88** (0.60–1.31)	**0.80** (0.60–1.06)
- Sugar sweetened beverages	**1.09** (0.83–1.44)	**1.16** (0.68–1.97)	**1.29** (0.88–1.88)	**1.09** (0.83–1.44)
- Dessert with coconut milk	**0.88** (0.56–1.39)	**1.12** (0.49–2.57)	**0.79** (0.41–1.52)	**0.91** (0.57–1.43)
Amount of fruit and vegetable intake (portion/day)	**1.05** (0.41–2.68)	**1.10** (0.98–1.24)	**1.02** (0.93–1.12)	**1.03** (0.96–1.10)

[a] $p < 0.05$

Original Article

Waist-to-Height Ratio Is a Good Predictor of Metabolic Syndrome in Adolescents: A Report From the Thai National Health Examination Survey V, 2014

Asia Pacific Journal of Public Health
2022, Vol. 34(1) 36–43

DOI: 10.1177/10105395211046474
journals.sagepub.com/home/aph
SAGE

Sirinapa Siwarom, MD[1], Kwanchai Pirojsakul, MD[1], Wichai Aekplakorn, MD[1], Witchuri Paksi, BNS[1], Pattapong Kessomboon, MD[2], Nareemarn Neelapaichit, PhD[1], Suwat Chariyalertsak, MD[3], Savitree Assanangkornchai, MD[4], and Surasak Taneepanichskul, MD[5]

Abstract

This study aimed to assess the performance of waist-to-height ratio (WHtR) in the prediction of metabolic syndrome and to determine the appropriate cutoff value in Thai adolescents. Demographic data, blood pressure, fasting blood glucose, and lipid profile were obtained from the Thai National Health Examination Survey V database. The performances of WHtR, waist circumference, body mass index (BMI), and BMI z-score were analyzed by the receiver operating characteristics. Among 2644 adolescents, metabolic syndrome was identified in 4.27%. The areas under the receiver operating characteristic curves of WHtR, waist circumference, BMI, and BMI z-score were comparable (0.924-0.960). Performance of WHtR was more constant across age groups compared with other parameters. Using the cutoff value of WHtR at 0.5 resulted in the sensitivity and specificity of 98.5%/83.4% and 88.9%/86.0% in males and females, respectively. In conclusion, the cutoff value of WHtR at 0.5 provided good sensitivity and specificity for identifying metabolic syndrome in both genders. However, the other clinical risk factors or more definite scores should be considered when further assessment.

Keywords
adolescents, metabolic syndrome, national survey, Thailand, waist-to-height ratio

		25.5	86.8	89.1
WHtR	0.955 (0.941-0.968)	0.49	100.0	80.2
		0.50	98.5	83.4
		0.51	97.1	85.0
		0.52	94.1	87.0
WC	0.96 (0.947-0.973)	86.5	91.2	89.8
		87.5	89.7	91.3
		88.5	88.2	92.3
		89.5	82.4	93
Female adolescents				
BMI z-score	0.924 (0.894-0.953)	1.0	91.1	81.0
		1.1	86.7	83.4
		1.2	86.7	83.9
		1.3	84.4	85.5
BMI	0.929 (0.905-0.952)	23	88.9	82.1
		23.5	84.4	84.4
		24	82.2	85.9
		24.5	80	88
WHtR	0.928 (0.949-0.948)	0.48	95.6	78.5
		0.49	93.3	82.3
		0.50	88.9	86.0
		0.51	84.4	87.7
WC	0.938 (0.921-0.956)	76.5	97.8	83.9
		77.5	95.6	85.9
		78.5	93.3	87.1
		79.5	86.7	88.5

Abbreviations: BMI, body mass index; CI, confidence interval; WHtR, waist-to-height ratio; AUROC, area under the receiver operating characteristic curve; WC, waist circumference.

PLOS ONE

RESEARCH ARTICLE

A Bayesian approach to combining multiple information sources: Estimating and forecasting childhood obesity in Thailand

John Bryant[1,2], Jongjit Rittirong[2]*, Wichai Aekplakorn[3], Ladda Mo-suwan[4], Pimolpan Nitnara[2]

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Abstract

We estimate and forecast childhood obesity by age, sex, region, and urban-rural residence in Thailand, using a Bayesian approach to combining multiple source of information. Our main sources of information are survey data and administrative data, but we also make use of informative prior distributions based on international estimates of obesity trends and on expectations about smoothness. Although the final model is complex, the difficulty of building and understanding the model is reduced by the fact that it is composed of many smaller submodels. For instance, the submodel describing trends in prevalences is specified separately from the submodels describing errors in the data sources. None of our Thai data sources has more than 7 time points. However, by combining multiple data sources, we are able to fit relatively complicated time series models. Our results suggest that obesity prevalence has recently starting rising quickly among Thai teenagers throughout the country, but has been stable among children under 5 years old.

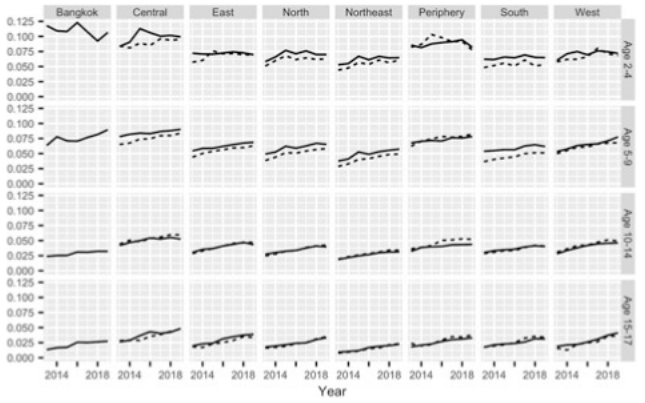

Fig 2. Direct estimates of obesity prevalence by age, region, and urban-rural residence for females, based on schools data.

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ผู้ใหญ่

Epidemiology/Health Services Research

ORIGINAL ARTICLE

Prevalence and Management of Diabetes and Associated Risk Factors by Regions of Thailand

Third National Health Examination S

Wichai Aekplakorn, PHD[1]
Jesse Abbott-Klafter, BA[2,3]
Amorn Premgamone, MD[4]
Bodi Dhanamun, MD[5]
Chalermchai Chaikittiporn, PHD[6]
Virasakdi Chongsu
Thanaruk Suwanpra
Weerayuth Chaipor
Siriwat Tiptaradol,
Stephen S. Lim, PHI

OBJECTIVE — The aim of this study was to determine the prevale
paired fasting glucose (IFG) and their association with cardiovascular ris
the management of blood glucose, blood pressure, and cholesterol in ir
by geographical regions of Thailand.

RESEARCH DESIGN AND METHODS — With the use of a str
pling design, data from a nationally representative sample of 37,138 indi
were collected using questionnaires, physical examination, and blood s

RESULTS — The prevalence of diabetes and IFG weighted to the na
was 6.7% (6.0% in men and 7.4% in women) and 12.5% (14.7% in men
respectively. Diabetes was more common in urban than in rural men b
was relatively uniform across geographical regions. In more than one-hal
the disease had not been previously diagnosed, although the majority of t

Prevalence and determinants

National Health Examination

Aekplakorn W, Chaiyapong
Suriyawongpaisal P.

J Med Assoc Thai. 2004 Jun;87(6):6

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Related citations

Epidemiology/Health Services Research

ORIGINAL ARTICLE

Prevalence and Management of Diabetes and Metabolic Risk Factors in Thai Adults

The Thai National Health Examination Survey IV, 2009

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Pattapong Kessomboon, MD, PHD[3]
Rassamee Sangthong, MD, PHD[4]
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the Thai National Health Examination Survey IV Study Group*

OBJECTIVE—To determine the prevalence of impaired fasting glucose (IFG) and undiagnosed and diagnosed diabetes in Thai adults in 2009 and examine the extent of changes in proportions of diagnosis, treatment, and control for blood glucose, high blood pressure, and high total cholesterol between 2004 and 2009.

RESEARCH DESIGN AND METHODS—Data from the multistage cross-sectional National Health Examination Survey (NHES) IV of 18,629 Thai adults aged ≥20 years conducted in 2009 were used to analyze and compare with the data from NHES III in 2004.

RESULTS—The prevalence of IFG and diabetes was 10.6 and 7.5%, respectively. Of all diabetes diagnoses, 35.4% were not previously diagnosed, and the proportion was higher in men than in women (47.3 vs. 23.4%, $P < 0.05$). Compared with those in year 2004, the proportions of individuals with diabetes and concomitant hypertension did not significantly decrease in 2009 in both sexes, but the proportions of women with diabetes who were abdominally obese or had

intake and low physical activity following the rapid economic growth and urbanization in this region (2).

In Thailand, a low-middle income country, diabetes has been a major cause of morbidity and mortality in the past decade (3). Diabetes alone is responsible for 3.3 and 8.3% of total deaths in Thai men and women, respectively (3). A high prevalence rate of diabetes in Thailand makes it among the top ten in Asia (2). In 2004, the National Health Examination Survey (NHES) III reported a prevalence of 6.7% in adults aged ≥15 years, of whom 53.3% went undiagnosed. The prevalence of impaired fasting glucose (IFG) is 12.5% (4). Undiagnosed diabetes increases the risk of complications as a result of being untreated, and about

Research Article

Prevalence of Diabetes and Relationship with Socioeconomic Status in the Thai Population: National Health Examination Survey, 2004–2014

Wichai Aekplakorn,[1] Suwat Chariyalertsak,[2] Pattapong Kessomboon,[3] Savitree Assanangkornchai,[4] Surasak Taneepanichskul,[5] and Panwadee Putwatana[6]

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Academic Editor: Janet H. Southerland

Objective. To determine the prevalence and trend of diabetes, related glycemic control, and influential socioeconon
factors in the Thai population aged ≥20 years during 2004–2014. *Methods.* Data from the Thai National Health Exa
Survey 2004, 2009, and 2014 were used. Age-adjusted prevalence was calculated, and the associations of education le
prevalence of diabetes and glycemic control were examined using logistic regression. *Results.* Age-adjusted preva
diabetes increased from 7.7% in 2004 to 7.8% in 2009 and 9.9% in 2014 (8.9% among men and 10.8% among
Proportions of undiagnosed diabetes were slightly decreased but remained high in 2014 (51.2% for men and 4
women). Diabetes prevalence was higher among those with primary education in both sexes; however, undiagnosed
was higher among women with secondary and university educations. The percentages of those treated and controlle
improved among men (45.9%) but not among women (36.4%). Unmet glycemic control was also higher among wor
secondary education levels and among men with university-level educations. *Conclusions.* Epidemic diabetes cont
grow in the Thai population, particularly in individuals with lower educational attainment. Measures to detect new c
strengthen glycemic control should be scaled up.

ผู้ใหญ่

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BMC Psychiatry

RESEARCH ARTICLE Open Access

Socio-economic inequalities in the association between alcohol use disorder and depressive disorder among Thai adults: a population-based study

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Abstract

Background: Previous evidence indicates significant associations between depressive disorders and alcohol use disorder (AUD) and their strong links with social conditions. This study aims to investigate the association between major depressive episode (MDE) and AUD across various socio-economic groups.

Methods: We analysed data from the 2014 Thai National Health Examination Survey containing a random sample of 13,177 adults aged ≥ 20 years from the general population. The Alcohol Use Disorder Identification Test was used to classify respondents into non-problem drinking (score 0–7), hazardous drinking (score 8–15), and harmful-dependent drinking (score 16–40). MDE was identified using questions based on the DSM-IV. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were calculated using multinomial logistic regression to determine the strength of associations between MDE as a predictor and AUD as an outcome variable across different socio-economic levels.

Results: The prevalence of MDE, hazardous, and harmful-dependent drinking was 2.5, 10.3, and 1.9%, respectively. The association between MDE and AUD was modified by wealth index, education level and area of residence. AORs for the association between MDE and harmful-dependent drinking were high among those in the highest (AOR = 8.68, 95% CI: 5.34, 14.11) and lowest (AOR = 7.14, 95% CI: 3.71, 13.73) levels of wealth index but not significant among those in the middle level (AOR = 1.78, 95% CI: 0.74, 4.25). Education had the strongest effect on the relationship between MDE and harmful-dependent drinking (AOR = 16.0, 95% CI: 10.30, 24.90 among those completing secondary school or higher and AOR = 1.44, 95% CI: 0.63, 3.33 among those completing primary school only). The association between MDE and harmful-dependent drinking was higher among people who lived in urban areas (AOR = 8.50, 95% CI: 5.50, 13.13) compared to those living in rural areas (AOR = 4.73, 95% CI: 3.31, 6.77).

Conclusion: Socio-economic factors modify the association between alcohol use disorder and major depressive disorder among Thai people.

Keywords: Alcohol use disorder, Depressive disorder, Socio-economic status, wealth index, National survey

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BMC Health Services Research

RESEARCH ARTICLE Open Access

Assessment of population coverage of hypertension screening in Thailand based on the effective coverage framework

Kulpimol Charoendee[1], Jiruth Sriratanaban[1], Wichai Aekplakorn[2] and Piya Hanvoravongchai[1*]

Abstract

Background: Hypertension (HT) is a major risk factor, and accessible and effective HT screening services are necessary. The effective coverage framework is an assessment tool that can be used to assess health service performance by considering target population who need and receive quality service. The aim of this study is to measure effective coverage of hypertension screening services at the provincial level in Thailand.

Methods: Over 40 million individual health service records in 2013 were acquired. Data on blood pressure measurement, risk assessment, HT diagnosis and follow up were analyzed. The effectiveness of the services was assessed based on a set of quality criteria for pre-HT, suspected HT, and confirmed HT cases. Effective coverage of HT services for all non-HT Thai population aged 15 or over was estimated for each province and for all Thailand.

Results: Population coverage of HT screening is 54.6%, varying significantly across provinces. Among those screened, 28.9% were considered pre-HT, and another 6.0% were suspected HT cases. The average provincial effective coverage was at 49.9%. Around four-fifths (82.6%) of the pre-HT group received HT and Cardiovascular diseases (CVD) risk assessment. Among the suspected HT cases, less than half (38.0%) got a follow-up blood pressure measurement within 60 days from the screening date. Around 9.2% of the suspected cases were diagnosed as having HT, and only one-third of them (36.5%) received treatment within 6 months. Within this group, 21.8% obtained CVD risk assessment, and half of them had their blood pressure under control (50.8%) with less than 1 % (0.7%) of them managed to get the CVD risk reduced.

Conclusions: Our findings suggest that hypertension screening coverage, post-screening service quality, and effective coverage of HT screening in Thailand were still low and they vary greatly across provinces. It is imperative that service coverage and its effectiveness are assessed, and both need improvement. Despite some limitations, measurement of effective coverage could be done with existing data, and it can serve as a useful tool for performance measurement of public health services.

Keywords: Hypertension, Screening, NCDs, Measure, Effective coverage, Access, Thailand

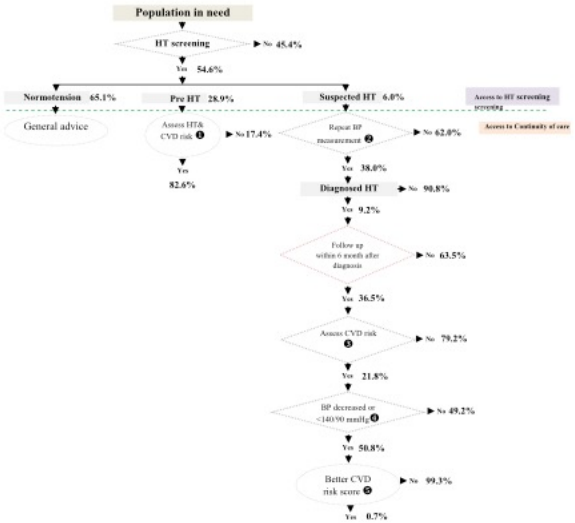

Fig. 4 Pathway of HT screening and prevention and control service coverage, showing proportion of population in each subgroup and the services they received

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ORIGINAL RESEARCH
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Cigarette Smoking Increased Risk of Overall Mortality in Patients With Non-alcoholic Fatty Liver Disease: A Nationwide Population-Based Cohort Study

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Charatcharoenwitthaya P, Karaketklang K and Aekplakorn W (2020) Cigarette Smoking Increased Risk of Overall Mortality in Patients With Non-alcoholic Fatty Liver

Background: The evidence suggests a detrimental effect of cigarette smoking on the progression of chronic liver disease. However, the impact of cigarette smoking on mortality among patients with non-alcoholic fatty liver disease (NAFLD) remain unclear.

Methods: We used the National Health Examination Survey data collected during 2008–2009 to link the National Death Index to follow-up respondent survival. Diagnosis of NAFLD was based on a lipid accumulation product in participants without significant alcohol use or other liver diseases.

Results: During 64,116 person-years of follow-up, 928 of 7,529 participants with NAFLD died, and the cumulative all-cause mortality was 14.5 per 1,000 person-years. In a Cox regression model adjusted for age, body mass index, alcohol intake, exercise, comorbidities, lipid profiles, and handgrip strength, current smoking increased the risk of mortality by 109% (adjusted hazard ratio (aHR): 2.09, 95% confidence interval [CI]: 1.18–3.71) compared with never smoker status in women, but showed only a trend toward harm among men (aHR: 1.41, 95% CI: 0.96–2.08). After controlling for potential confounders, smoking ≥10 pack-years continued to show a significant harmful effect on all-cause mortality among women (aHR: 5.40, 95% CI: 2.19–13.4), but not in men. Among women who drink alcohol ≥10 grams per day, current smoking (aHR: 13.8, 95% CI: 1.66–145) and smoking ≥ 10 pack-years (aHR: 310, 95% CI: 78–1,296) also significantly increased risk of death.

Conclusion: This nationwide population-based study highlight a detrimental effect of

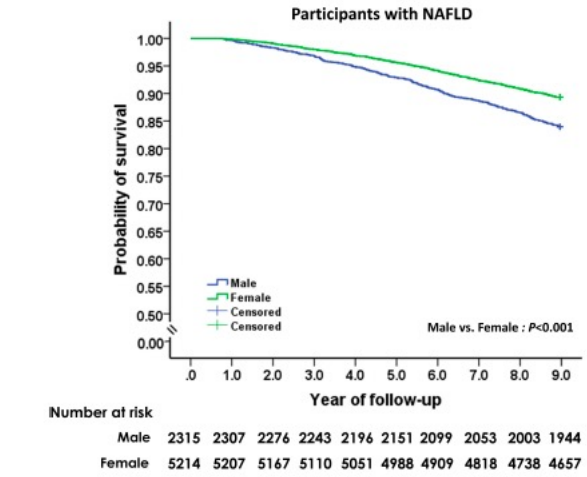

FIGURE 2 | Unadjusted Kaplan-Meier survival analysis of men and women with non-alcoholic fatty liver disease.

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Women and other risk factors for chronic kidney disease of unknown etiology in Thailand: National Health Examination V Survey

Wichai Aekplakorn[1], Suwat Chariyalertsak[2], Pattapong Kessomboon[3], Sawitri Assanangkornchai[4], Surasak Taneepanichskul[5], Nareemarn Neelapaichit[6], Anchalee Chittamma[7] & Chagriya Kitiyakara[8]✉

There are limited data on chronic kidney disease of unknown etiology (CKDu) from Southeast Asia. Initially described in working age men, a common approach to detect CKDu that includes all adults has recently been proposed. We determined the prevalence, and risk factors for CKDu using data from a cross-sectional, nationally representative survey of the adult population of Thailand. We used a proxy for CKDu as age < 70 with impaired kidney function (eGFR < 60) in the absence of diabetes and hypertension (CKDu1) and heavy proteinuria (CKDu2). Prevalence estimates were probability-weighted for the Thai population. The associations between risk factors and CKDu or elderly subjects with eGFR < 60 without traditional causes were assessed by multivariable logistic regression. Of 17,329 subjects, the prevalence were: eGFR < 60, 5.3%; CKDu1 0.78%; CKDu2, 0.75%. CKDu differed by 4.3-folds between regions. Women, farmers/laborers, older age, gout, painkillers, rural area, and stones were independent risk factors for CKDu. Women, age, rural, gout, painkillers were significant risk factors for both CKDu and elderly subjects. These data collected using standardized methodology showed that the prevalence of CKDu in Thailand was low overall, although some regions had higher risk. Unlike other countries, Thai women had a two-fold higher risk of CKDu.

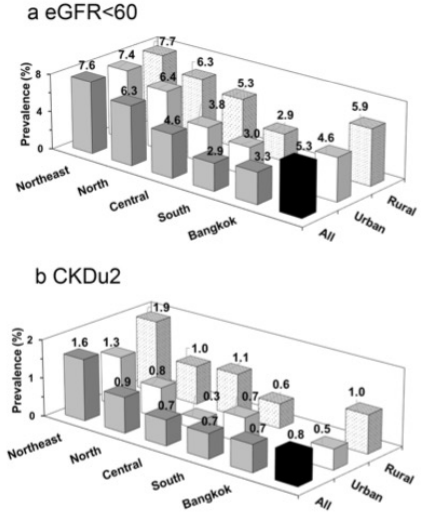

Figure 2. Regional and area distribution of (**a**) eGFR < 60; (**b**) CKDu2. Black column represents total

PLOS ONE

RESEARCH ARTICLE

Universal coverage but unmet need: National and regional estimates of attrition across the diabetes care continuum in Thailand

Lily D. Yan[1], Piya Hanvoravongchai[2], Wichai Aekplakorn[3], Suwat Chariyalertsak[4,5], Pattapong Kessomboon[6], Sawitri Assanangkornchai[7], Surasak Taneepanichskul[8], Nareemarn Neelapaichit[9,10], Andrew C. Stokes[11]*

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Abstract

Background

Diabetes is a growing challenge in Thailand. Data to assess health system response to diabetes is scarce. We assessed what factors influence diabetes care cascade retention, under universal health coverage.

Methods

We conducted a cross-sectional analysis of the 2014 Thai National Health Examination Survey. Diabetes was defined as fasting plasma glucose ≥126mg/dL, or on treatment. National and regional care cascades were constructed across screening, diagnosis, treatment, and control. Unmet need was defined as the total loss across cascade levels. Logistic regression was used to examine the demographic and healthcare factors associated with cascade attrition.

Findings

We included 15,663 individuals. Among Thai adults aged 20+ with diabetes, 67.0% (95% CI 60.9% to 73.1%) were screened, 34.0% (95% CI 30.6% to 37.2%) were diagnosed, 33.3% (95% CI 29.9% to 36.7%) were treated, and 26.0% (95% CI 22.9% to 29.1%) were controlled. Total unmet need was 74.0% (95% CI 70.9% to 77.1%), with regional variation ranging from 58.4% (95% CI 45.0% to 71.8%) in South to 78.0% (95% CI 73.0% to 83.0%) in Northeast. Multivariable models indicated older age (OR 1.76), males (OR 0.65), and a higher density of medical staff (OR 2.40) and health centers (OR 1.58) were significantly associated with being diagnosed among people with diabetes. Older age (OR 1.80) and

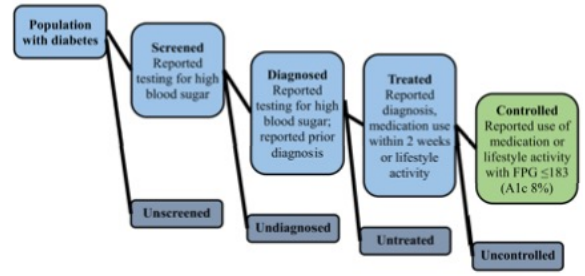

Fig 1. Diabetes care cascade framework.

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ผู้สูงอายุ

scientific reports

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Prevalence of anemia and association with mortality in community-dwelling elderly in Thailand

E. Karoopongse[1], V. Srinonprasert[1], C. Chalermsri[2] & W. Aekplakorn[3]✉

Anemia is one of the most common health problems in the elderly in low and middle income countries. Evidence from studies in high income countries suggests that the presence of anemia may predict mortality. We aimed to estimate the prevalence of anemia and the determine the relationship of hemoglobin, mean corpuscular volume (MCV) and mortality in community dwelling Thai elderly. Data from subjects aged ≥ 60 years from the Fourth Thai National Health Examination Survey were analyzed. Comorbidity and hematologic indexes including MCV were obtained. The Cox proportional hazard model was applied to explore associations with mortality. Data from 8,935 subjects were obtained. The mean age of participants was 69.2 years (SD 6.8). 3446 (38.2%) of subjects had anemia; 1931(56%) of these were classified as mild and normocytic. With a total 51,268 person-year of follow up, 753 participants with anemia died, and the cumulative all-cause mortality was 38.5 per 1,000 person-years. The presence of anemia was associated with an increased risk of mortality with HR of 1.66 (95% CI = 1.50–1.84 , p < 0.001). Among subjects with low MCV, hemoglobin level < 10 g/dl in men and < 9 g/dl in women significantly increased the risk of mortality (HR of 2.71, 95% CI = 1.88–3.91 and HR of 3.14, 95%CI = 2.11–4.67, respectively) Persons with anemia and normal MCV, the association with mortality was evident at hemoglobin levels below 11 g/dl for both males and females. (HR of 1.98, 95% CI = 1.67–2.35). Anemia is a moderate to severe public health significant in the population for community dwelling elderly in Thailand. At the same level of Hemoglobin, low MCV population seem to have lower mortality rate than normal MCV. Systematic screening for anemia should be implemented to identify patients at increased risk of mortality. The future research should be focus on causes of anemia and factors contributing to increased mortality in normal to high MCV would be of interest. If this could lead to identifying modifiable causes, it would be beneficial for improving mortality risk among older people.

Chalermsri et al. BMC Public Health (2022) 22:377
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BMC Public Health

RESEARCH Open Access

Socio-demographic characteristics associated with the dietary diversity of Thai community-dwelling older people: results from the national health examination survey

Chalobol Chalermsri[1,2*], Syed Moshfiqur Rahman[1], Eva-Charlotte Ekström[1], Weerasak Muangpaisan[2], Wichai Aekplakorn[3], Warapone Satheannopakao[4] and Shirin Ziaei[1]

Abstract

Background: Dietary diversity (DD) is an indicator of nutrient intake and is related to health outcomes in older people. Currently, limited research exists regarding factors associated with DD in older people in developing countries, such as Thailand, despite rapid growth in this population. Therefore, this study aims to examine the association between socio-demographic characteristics and DD in Thai older people.

Methods: A cross-sectional study based on the fifth Thai National Health Examination Survey (NHES-V) conducted between 2013 and 2015 was performed. A total of 7,300 nationally representative older participants aged ≥ 60 years were included. The individual-level dietary diversity score (DDS) was assessed as the frequency of consumption of eight food groups using food frequency questionnaires. Each food group was scored from 0 to 4 according to the frequency of consumption. The DDS was calculated as the sum of the scores, ranging from 0 to 32. Socio-demographic characteristics, including age, sex, highest education level, wealth index, living conditions, and residential area, were assessed. Data were analyzed using multiple linear regression and adjusted for complex survey design.

Results: The participants had a mean age of 69.7 (SD 7.6) years. The mean DDS of participants was 18.4 (SD 3.9). In the adjusted model, a higher educational level, a higher wealth index, and living in an urban area were positively associated with DDS, with adjusted β (95% CI) values of 1.37 (1.04, 1.70) for secondary education or higher, 0.81 (0.55, 1.06) for the richest group, and 0.24 (0.10, 0.44) for living in an urban area. Nevertheless, living alone had negative associations with DDS, with a β (95% CI) of - 0.27 (- 0.53, - 0.00).

Conclusions: This study showed that a higher educational level, a higher wealth index, and living in an urban area had a positive association, whereas living alone had a negative association with DD among Thai older participants. Interventions aiming to improve dietary diversity among older people might benefit from targeting more vulnerable groups, particularly those with less education and wealth, those living alone, or those in rural areas.

Keywords: Dietary diversity, Socio-demographic, Older people, Thailand

PLOS ONE

RESEARCH ARTICLE

Extent of aging across education and income subgroups in Thailand: Application of a characteristic-based age approach

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Data Availability Statement: Data used in this study is not publicly available because of the restrictions imposed by data providers and the ethical approval that governs the survey. Access to data would only be granted upon request and subject to an assessment by the research team and certain agreement provisions of Human Research Ethics Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University.

Abstract

Aim

This study aimed to identify differences in physical performance across various socioeconomic groups within an older population and to convert those differences into a common metric to facilitate comparisons of aging speed across socioeconomic subgroups.

Methods

We employed data from the 2009 National Health Examination Survey of Thailand. Physical performance was assessed using three health characteristics: grip strength, as a measure of upper body strength; walking speed, as a measure of lower body strength; and a combined measure of grip strength and walking speed, to capture the strength of the whole body. Education level and income were used to distinguish socioeconomic subpopulations. We followed a characteristic-based age approach to transform these population characteristics, which were measured in different units, into a common and comparable aging metric, referred to as $\alpha - age$.

Results

Physical aging trajectories varied by sex and socioeconomic status. Some education, particularly secondary or higher education levels, was significantly associated with greater physical strength in older age for both men and women, whereas higher income was significantly associated with physical strength only for men. Across the three health characteristics, having a primary education slowed age-related declines by up to 6.3 years among men and 2.8 years among women, whereas being in a higher income group slowed age-related declines by 8.2 years among men and up to 4.9 years among women.

Chailurkit *et al. BMC Public Health* 2011, **11**:853
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BMC Public Health

RESEARCH ARTICLE Open Access

Regional variation and determinants of vitamin D status in sunshine-abundant Thailand

La-or Chailurkit[1,3*], Wichai Aekplakorn[2] and Boonsong Ongphiphadhanakul[1]

Abstract

Background: Vitamin D insufficiency is highly prevalent. Most of the studies concerning vitamin D status were generated from countries situated at temperate latitudes. It is less clear what the extent of vitamin D insufficiency is in countries situated in the tropics and how geographical regions within country would affect vitamin D status. In the present study, we investigated vitamin D status in Thais according to geographical regions and other risk factors.

Methods: Subjects consisted of 2,641 adults, aged 15 - 98 years, randomly selected from the Thai 4th National Health Examination Survey (2008-9) cohort. Serum 25 hydroxyvitamin D were measured by liquid chromatography/tandem mass spectrometry. Data were expressed as mean ± SE.

Results: Subjects residing in Bangkok, the capital city of Thailand, had lower 25(OH)D levels than other parts of the country (Bangkok, central, northern, northeastern and southern regions: 64.8 ± 0.7, 79.5 ± 1.1, 81.7 ± 1.2, 82.2 ± 0.8 and 78.3 ± 1.3 nmol/L, respectively; $p < 0.001$). Within each region, except for the northeastern part of the country, subjects living inside municipal areas had lower circulating 25(OH)D (central, 77.0 ± 20.9 nmol/L vs 85.0 ± 22.1 nmol/L, $p < 0.001$; north 79.3 ± 22.1 nmol/L vs 86.8 ± 21.8 nmol/L, $p < 0.001$; northeast 84.1 ± 23.3 nmol/L vs 87.3 ± 20.9 nmol/L, $p = 0.001$; south, 76.6 ± 20.5 nmol/L vs 85.2 ± 24.7 nmol/L, $p < 0.001$). Overall, the prevalence of vitamin D insufficiency was 64.6%, 46.7%, and 33.5% in Bangkok, municipal areas except Bangkok, and outside municipal area in other parts of the country, respectively. In addition, the prevalence of vitamin D insufficiency according to geographical regions was 43.1%, 39.1%, 34.2% and 43.8% in the central, north, northeast and south, respectively. After controlling for covariates in multiple linear regression analysis, the results showed that low serum 25(OH)D levels were associated with being female, younger age, living in urban and Bangkok.

Conclusions: Vitamin D insufficiency is common and varies across geographical regions in Thailand.

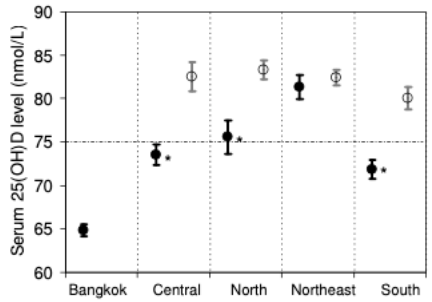

Figure 3 Vitamin D status inside (closed circle) and outside (open circle) the municipal area in each region. Values are mean ± SE. * = significant compared to outside the municipal area within region

THYROID
Volume 23, Number 1, 2013

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ORIGINAL STUDIES
THYROID FUNCTION AND DYSFUNCTION

High Vitamin D Status in Younger Individuals Is Associated with Low Circulating Thyrotropin

La-or Chailurkit,[1] Wichai Aekplakorn,[2] and Boonsong Ongphiphadhanakul[1]

Background: Vitamin D is an immunomodulator and may affect autoimmune thyroid diseases. Vitamin D has also been shown to influence thyrocytes directly by attenuating thyrotropin (TSH)-stimulated iodide uptake and cell growth. However, it is unclear how vitamin D status is related to TSH at the population level. The goal of the present study was to investigate the relationship between vitamin D status and TSH levels according to thyroid autoantibodies in a population-based health survey in Thailand.
Methods: A total of 2582 adults, aged 15–98 years, were randomly selected according to the geographical region from the Thailand 4th National Health Examination Survey sample. By study design, the sexes were equally represented. Serum levels of 25-hydroxyvitamin D [25(OH)D], TSH, the thyroid peroxidase antibody (TPOAb), and the thyroglobulin antibody (TgAb) were measured in all subjects.
Results: The mean age was 55.0±0.4 (SE) years. In subjects positive for serum TgAb, serum TSH levels were higher, whereas total serum 25(OH)D levels were lower. In addition, the prevalence of vitamin D insufficiency in TgAb-positive subjects was significantly higher than that observed in TPOAb- and TgAb-negative subjects, whether based on cutoff values of 20 or 30 ng/mL: 8.3% vs. 5.6%, $p<0.05$; or 47.6% vs. 42.0%, $p<0.05$, respectively. However, vitamin D status was not associated with positive TPOAb and/or TgAb after controlling for sex and age. To explore the probable interaction between vitamin D status and age on serum TSH, analyses were performed according to age tertiles; it was found that higher 25(OH)D levels were independently associated with lower TSH, but only in subjects in the lowest age tertile.
Conclusions: This population-based study showed that high vitamin D status in younger individuals is associated with low circulating TSH.

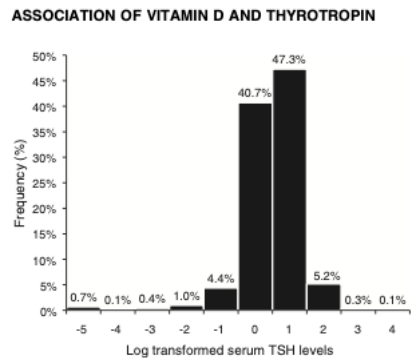

FIG. 1. Distribution of log-transformed serum thyrotropin (TSH) levels.

International Journal of *Environmental Research and Public Health*

MDPI

Article

The Association of Serum Bisphenol A with Thyroid Autoimmunity

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Abstract: *Introduction*: Data on the association of bisphenol A (BPA) exposure and autoimmunity in humans is unclear. *Objective*: To elucidate the influence of BPA on thyroid autoimmunity, in the present study we assessed the association between serum BPA and thyroid autoantibodies. *Methods*: Serum samples from 2361 subjects, aged ≥15 years, from the Thai 4th National Health Examination Survey were measured for BPA, antithyroglobulin (TgAb), antithyroperoxidase (TPOAb) and antithyrotrophin receptor (TRAb) antibodies. *Results*: The proportion of subjects positive for TgAb, TPOAb and TRAb were 11.1%, 14.9% and 1.9%, respectively. With regard to BPA, 51.9% had serum BPA levels exceeding the detection limit of the assay (0.3). There was a significant increasing trend for subjects with TgAb ($p < 0.05$) and TPOAb ($p < 0.001$) positivity as BPA quartiles increased, particularly in the highest quartile. In contrast, no relationship between BPA quartiles and TRAb was found. Logistic regression analysis showed that age, gender and BPA quartiles were determinants of TPOAb or TgAb positivity, independent of BMI. However, only the association between BPA and TPOAb positivity was consistent in both men and women. *Conclusions*: BPA was independently associated with TPOAb positivity. However, its mechanism related to TPOAb positivity, subsequently leading to autoimmune thyroid disease, needs further investigation.

Keywords: bisphenol A; antithyroglobulin antibody; antithyroperoxidase antibody; antithyrotrophin receptor antibody; autoimmunity

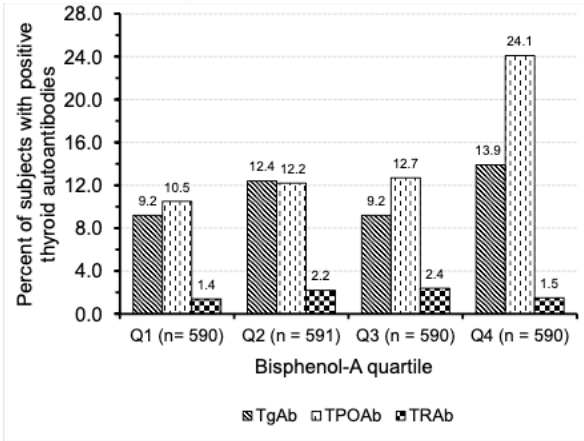

Figure 1. Percent positive rate of thyroid autoantibodies in relation to BPA quartiles.

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ORIGINAL ARTICLE

EPIDEMIOLOGY, CLINICAL PRACTICE AND HEALTH

Vitamin D insufficiency predicts mortality among older men, but not women: A nationwide retrospective cohort from Thailand

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Aim: Previous studies on the association between low vitamin D level and increased mortality mainly came from high-income countries. The primary objective of the present study was to examine the effect of sex on the association between 25-hydroxyvitamin D_2 and D_3 and mortality among community-dwelling older people in Thailand.

Methods: A cohort of individuals aged ≥60 years from the Thai 4th National Health Examination Survey carried out in 2008 were followed and linked to a vital registry in 2015. Data regarding comorbid diseases, physical activity and serum vitamin D were obtained at the baseline assessment. Factors associated with all-cause mortality were determined using Cox proportional hazards models.

Results: A total of 1268 participants with a median age of 74.0 years (interquartile range 67.0–81.0) were included. The prevalence of vitamin D insufficiency was 24.5% and 43.9% in men and women, respectively. Vitamin D insufficiency was significantly associated with all-cause mortality only among men (adjusted HR 1.77, 95% CI 1.25–2.51), but not women. Analysis of 25-hydroxyvitamin D3 divided into tertiles also showed an association with an adjusted HR of 1.83 (95% CI 1.23–2.72) for the lowest tertile in men. Diabetes was an effect modifier for low serum vitamin D and male sex, with HR 3.34 (95% CI 1.76–6.33, $P < 0.001$) in diabetic men with vitamin D insufficiency.

Conclusions: Low serum vitamin D is an independent risk factor for increased mortality in community-dwelling Thai older men. Further randomized controlled study to investigate the benefit of vitamin D3 supplementation in older persons, particularly men, is warranted. **Geriatr Gerontol Int 2018; 18: 1585–1590.**

Keywords: mortality, older persons, serum 25-hydroxyvitamin D_3, Thailand, vitamin D insufficiency.

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Frailty index to predict all-cause mortality in Thai community-dwelling older population: A result from a National Health Examination Survey cohort

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ABSTRACT

Background: Frailty is a clinical state of increased vulnerability from aging-associated decline. We aimed to determine if a Thai Frailty Index predicted all-cause mortality in community-dwelling older Thais when accounting for age, gender and socioeconomic status.
Methods: Data of 8195 subjects aged 60 years and over from the Fourth Thai National Health Examination Survey were used to create the Thai Frailty Index by calculating the ratio of accumulated deficits using a cut-off point of 0.25 to define frailty. The associations were explored using Cox proportional hazard models.
Results: The mean age of participants was 69.2 years (SD 6.8). The prevalence of frailty was 22.1%. The Thai Frailty Index significantly predicted mortality (hazard ratio = 2.34, 95% CI 2.10–2.61, p < 0.001). The association between frailty and mortality was stronger in males (hazard ratio = 2.71, 95% CI 2.33–3.16). Higher wealth status had a protective effect among non-frail older adults but not among frail ones.
Conclusions: In community-dwelling older Thai adults, the Thai Frailty Index demonstrated a high prevalence of frailty and predicted mortality. Frail older Thai adults did not earn the protective effect of reducing mortality with higher socioeconomic status. Maintaining health rather than accumulating wealth may be better for a longer healthier life for older people in middle income countries.

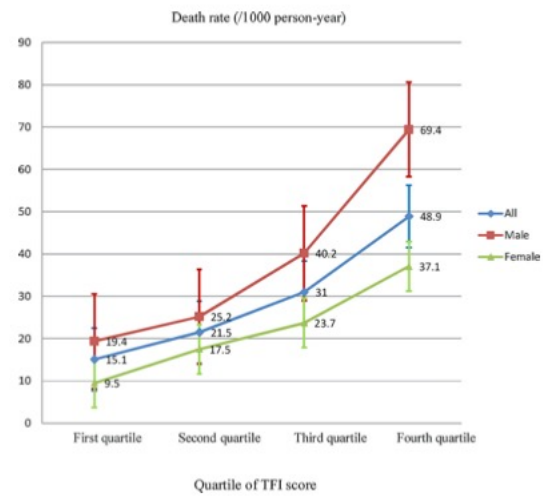

Fig. 1. Deaths per 1000 person-years according to quartile of TFI score comparing between genders.

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Original Article

Original Article

Seroprevalence of anti—*Pythium insidiosum* antibodies in the Thai population

Tassanee Lohnoo[1], Wanta Yingyong[1], Yothin Kumsang[1], Penpan Payattikul[1], Chalisa Jaturapaktrarak[1], La-or Chailurkit[2], Wichai Aekplakorn[3] and Theerapong Krajaejun[4,*]

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Abstract

Pythiosis is a life-threatening disease of humans and other animals in tropical and subtropical countries. The causative agent is *Pythium insidiosum*. Diagnosis of pythiosis can be missed due to the lack of awareness in the medical community. Treatment of the disease is difficult and challenging. Most pythiosis patients end up losing an infected organ (i.e., eye or leg), and many die from uncontrolled infection. In 2006, the largest series of human cases of pythiosis (~100) was reported from Thailand, highlighting the nationwide distribution of this high morbidity and mortality disease. The global distribution of *P. insidiosum* is demonstrated by its detection in several regions around the world. Epidemiological studies of exposure to the pathogen in the general population are lacking. Here we used a combination of two established diagnostic tools (i.e., ELISA and Western blot) to explore the seroprevalence of anti–*P. insidiosum* antibodies in 2641 individuals, aged ≥ 15 years, sampled from Thailand. Four individuals were identified with anti–*P. insidiosum* antibodies in their sera, thus providing a statistically-estimated prevalence of ~7 in 10000 or ~32000 in the entire Thai population. The detection of the anti–*P. insidiosum* antibodies in healthy people with no history of pythiosis suggests that subclinical infections can occur. Taking into account the seroprevalence of anti–*P. insidiosum* antibodies, the global distribution of the organism, the nationwide distribution of patients, and the high morbidity and mortality of the disease, awareness of pythiosis should be raised as a public health concern in Thailand and other countries.

Key words:

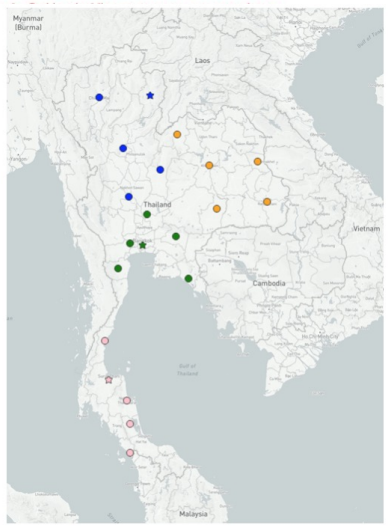

Figure 1. Map of Thailand shows geographic locations of 21 provinces, in the northern (blue), northeastern (orange), central (green), and southern (pink) regions of Thailand, where from the serum samples of 2641 randomly selected participants were derived. The map was generated by the Microreact program,[29] which can be visualized as an online interactive map at https://microreact.org/project/rke.0ETsb. The "star" sign indicates the provinces that four participants with anti–*P. insidiosum* antibodies were identified. This Figure is reproduced in color in the online version of *Medical Mycology*.

frontiers in Pharmacology

ORIGINAL RESEARCH
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Genetic Diversity of *HLA* Class I and Class II Alleles in Thai Populations: Contribution to Genotype-Guided Therapeutics

Patompong Satapornpong[1,2,3], Pimonpan Jinda[1,2], Thawinee Jantararoungtong[1,2], Napatrupron Koomdee[1,2], Chonlawat Chaichan[1,2], Jirawat Pratoomwun[1,2], Chalitpon Na Nakorn[4], Wichai Aekplakorn[5], Alisa Wilantho[6,7], Chumpol Ngamphiw[6,7], Sissades Tongsima[6,7] and Chonlaphat Sukasem[1,2,8]

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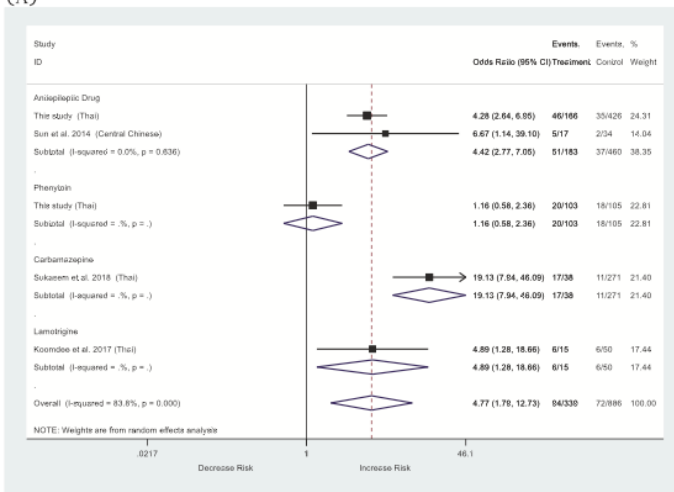
Human leukocyte antigen (HLA) class I and II are known to have association with severe cutaneous adverse reactions (SCARs) when exposing to certain drug treatment. Due to genetic differences at population level, drug hypersensitivity reactions are varied, and thus common pharmacogenetics markers for one country might be different from another country, for instance, *HLA-A*31:01* is associated with carbamazepine (CBZ)-induced SCARs in European and Japanese while *HLA-B*15:02* is associated with CBZ-induced Stevens–Johnson syndrome/toxic epidermal necrolysis (SJS/TEN) among Taiwanese and Southeast Asian. Such differences pose a major challenge to prevent drug hypersensitivity when pharmacogenetics cannot be ubiquitously and efficiently translated into clinic. Therefore, a population-wide study of the distribution of HLA-pharmacogenetics markers is needed. This work presents a study of Thai *HLA* alleles on both *HLA* class I and II genes from 470 unrelated Thai individuals by means of polymerase chain reaction sequence-specific oligonucleotide (PCR-SSO) in which oligonucleotide probes along the stretches of *HLA-A*, *-B*, *-C*, *-DRB1*, *-DQA1*, and *-DQB1* genes were genotyped. These 470 individuals were selected according to their regional locations, which were from North, Northeast, South, Central, and a capital city, Bangkok. Top ranked *HLA* alleles in Thai population include *HLA-A*11:01* (26.06%), *-B*46:01* (14.04%), *-C* 01:02* (17.13%), *-DRB1*12:02* (15.32%), *-DQA1*01:01* (24.89%), and *-DQB1*05:02* (21.28%). The results revealed that the distribution of HLA-pharmacogenetics alleles from the South had more HLA-B75 family that a typical *HLA-B*15:02* pharmacogenetics test for SJS/TEN screening would not cover. Besides the view across the nation, when compared *HLA*

(A)



Clinical Study

Association between HLA-B Alleles and Carbamazepine-Induced Maculopapular Exanthema and Severe Cutaneous Reactions in Thai Patients

Chonlaphat Sukasem[1,2,3,4] Chonlawat Chaichan,[1,2] Thapanat Nakkrut,[5,6] Patompong Satapornpong,[1,2] Kanoot Jaruthamsophon,[7] Thawinee Jantararoungtong,[1,2] Napatrupron Koomdee,[1,2] Suthida Sririttha,[1,2,8] Sadeep Medhasi,[9] Sarawut Oo-Puthinan,[5] Ticha Rerkpattanapipat,[4,10] Jettanong Klaewsongkram,[4,11] Pawinee Rerknimitr,[4,12] Papapit Tuchinda,[4,13] Leena Chularojanamontri,[4,13] Napatra Tovanabutra,[4,14] Apichaya Puangpetch,[1,2] and Wichai Aekplakorn[15]

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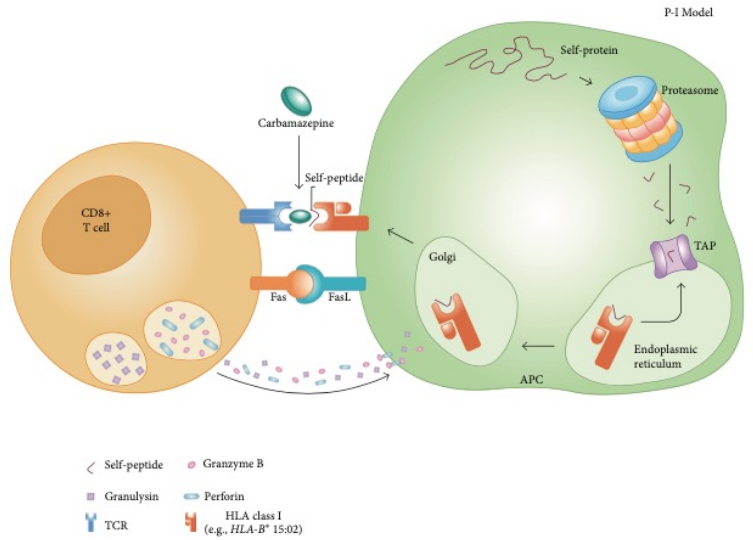

FIGURE 1: The "pharmacological interaction with immune receptors (p–i)" model of immune activation during carbamazepine-induced hypersensitivity reactions.

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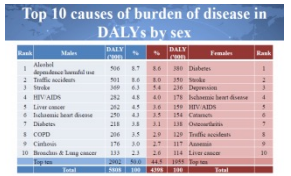
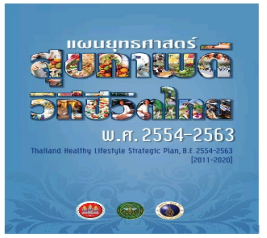
Utilization

- การกำหนดเป้าหมายการยุทธศาสตร์
- การคำนวณภาระโรค (DALY)
- ประเด็น สุขภาพในสมัชชาสุขภาพแห่งชาติ เช่น โรคอ้วน สุขภาพเด็ก เกลือ
- การนำไปใช้ในการขับเคลื่อน
  - สสส. กท สธ. โครงการคนไทยไร้พุง
  - สสส. การรณรงค์กินผักและผลไม้
  - สปสช. ผลการสำรวจความครอบคลุมของการตรวจรักษา โรคเบาหวา
  - เบาหวาน ความดันโลหิตสูง และไขมันผิดปกติ
- การจัดทำสื่อเผยแพร่สำหรับบุคลากรสุขภาพ
- การเผยแพร่ทางสื่อต่างๆทางสาธารณะให้ประชาชน
- Further Research





Research

- Epidemiology study
- Specific Topics
  - Child health
  - Adult health
  - Elderly health
- Cohort study:
  - Longitudinal study
- Genetic research
  - Microbiome
  - SNPs
  - WGS

"Without data, you're just another person with an opinion.”

W. Edwards Deming

“If we knew what were doing it wouldn’t be called research.”

Albert Einstein

Thank You

สถาบันวิจัยระบบสาธารณสุข

วช. NRCT