Concept note

A cost-utility analysis of policy options for dietary sodium intake control in Thailand

Contact information

Name of focal point	Dr. Pritaporn Kingkaew
Full address	Health Intervention and Technology Assessment Program (HITAP) Department of Health, Ministry of Public Health, Tiwanon road, Nonthaburi 11000, Thailand
Telephone number	+66-2-590-4549
Fax number	+66-2-590-4369
Mobile number	-
Email address	pritaporn.k@hitap.net

Background

Excess dietary sodium intake is a risk factor that contributes to non-communicable diseases such as hypertension, chronic kidney disease, and cardiovascular diseases. Excessive intake of sodium is associated with elevated blood pressure which was ranked as the leading risk factor of global disease burden [1]. In 2010, the Global Burden of Disease study estimated that excess dietary salt intake was ranked as the 11th risk factor of the global disease burden; the higher burden was observed in the Southeast Asia Region (7th rank) [1]. The World Health Organization has recommended that adults should consume sodium less than 2 grams a day (5 grams of salt per day) [2]. In order to meet this recommendation, around 50% reduction in daily salt intake from current levels is in need for most counties [3]. In Thailand, it was estimated that Thai people consume over 10 grams of salt per day on average. From the Thai National Health Examination Survey IV, the median sodium intakes were 3.3 grams per day for adults aged over 16 years old [4]. Concerning over their population health, Thailand has set the target of 30% reduction of population sodium intake by 2025.

A wide range of public health intervention to reduce sodium consumption has been shown to be effective and cost-effective; theses interventions include product reformulation, relabelling, sodium tax, and health promotion campaign [3]. However, the majority of these economic evaluation studies were conducted in high-income countries where the sources of diet sodium differ from low- and middle-income countries. In Thailand, around one-third of Thai population consume salty products—such as fish sauces or soy sauces—during cooking or at the table. Therefore, it is uncertain that public health policies from developed setting will be cost-effective and applicable to the Thai context. There is a need to develop economic models that estimate the impact of public health policies in terms of effectiveness and cost-effectiveness of policy options for dietary sodium intake control to inform decision-makers in Thailand.

Objective

To estimate the cost effectiveness of policy options for dietary sodium intake control in Thailand

Methods

Study design

A cost-utility analysis will be conducted using a population-based Markov model to estimate the costs and benefits in terms of quality-adjusted life year (QALY) of policies to reduce salt intake comparing with no policy in Thai population. **Table 1** summaries important aspects of the study design. Policy options (e.g. tax on sodium used for processed food, food labelling, reformulation, mass media campaign, etc.) will be identified and prioritised for evaluation from a stakeholder consultation meeting, a recommended Health Technology Assessment (HTA) process in Thailand. The total costs and incremental costs of policies to reduce salt intake includes costs of policy implementation and also healthcare costs saving from diseases preventions. The study will be conducted using costs not only incurred from the health system perspective but also from the societal perspective. The lifetime horizon will be considered to capture all possible costs and outcomes that might occur. All future costs and benefits will be discounted at the rate of 3% per annum following the recommendation of the Thai health technology assessment guideline. Distributional cost-effectiveness analysis (DCEA) framework [5] will be used for incorporating health inequality concerns about the effects of the financial burden from the tax policy into the economic evaluation.

Table 1 Summary of important aspects of the study design

No.	Item	Details
1	Type of economic evaluation	Cost-utility analysis (CUA)
2	Population of interest	Thai population aged 18 and above

No.	Item	Details
3	Interventions	Policy options for dietary sodium intake control, to be identified and prioritised from a stakeholder consultation meeting
4	Comparator	No policy implementation
5	Analytical approach	Population-based Markov model (see **figure 1** for the conceptual framework of modelling approach)
6	Perspective	Societal perspective
7	Time horizon for costs and outcomes	Lifetime time horizon
8	Discount rate	An annual discount rate of 3% for both costs and outcomes
9	Health impact	Hypertension, cardiovascular diseases and chronic kidney diseases
10	Primary outcome	Quality-adjusted life year (QALY)
11	Result presentation	Incremental cost-effectiveness ratio (ICER), in THB per QALY gained and cost-effectiveness plane
12	Cost-effectiveness threshold	160,000 THB per QALY gained
13	Uncertainty analysis	One-way (Tornado diagram) & probabilistic sensitivity analysis (Cost-effectiveness acceptability curves)
14	Equity implication	Distributional cost-effectiveness analysis (DCEA) framework

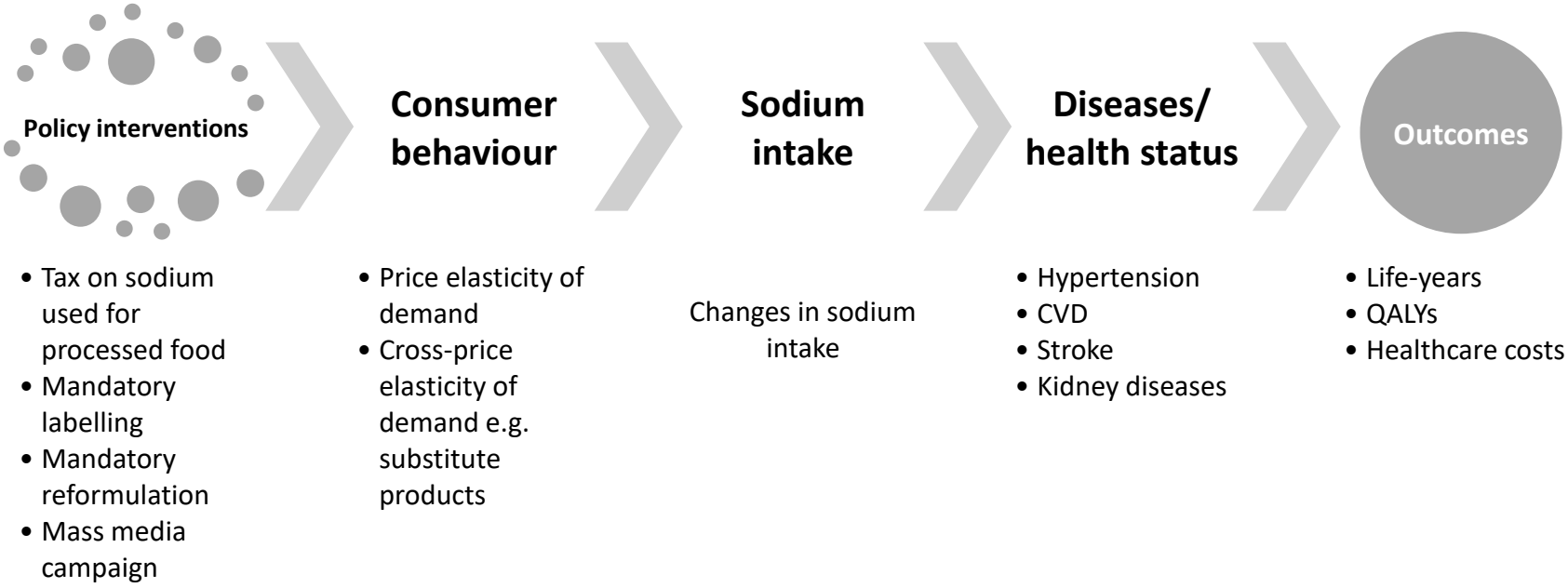

Figure 1 Conceptual framework for modelling approach

Data sources

Model input parameters will be reviewed from existing literature, focusing on the Thai context when applicable. **Table 2** summarises the plan for data collection and data sources.

Table 2 Planned for data sources

Types of data	Details	Planned data sources
Consumer behaviour	Food consumption	- The Thai 2017 Food Consumption Behaviour Survey - The Thai Food Composition database (Thai FCD)
	Price elasticity of demand	Literature review
	Cross-price elasticity of demand e.g. substitute products	Literature review
Sodium intake	Baseline sodium intake among the Thai population	The Thai National Health Examination Survey IV [4]
Transitional probability	Baseline transitional probability of disease progression for CVD, stroke and chronic kidney diseases	Previous economic evaluation study and literature review
Risk reduction	Risk reduction of diseases	Literature review, focusing on the most recent meta-analysis studies
Costs and healthcare utilization	Programme cost for policy implementation	Literature review
	OPD and IPD visits for CVD, stroke and chronic kidney diseases	National Health Security office
	Non-health items (transportation, food and accommodation related to healthcare seeking)	Thailand costing menu
Utility	Utility values of patients with diseases attribute from excess sodium intake	Literature review, focusing on the utility values measured from EQ-5D

Data analysis and presentation of results

The incremental cost-effectiveness ratio (ICER) of each policy option will be calculated based on the incremental cost and incremental QALY of each policy option compared to 'no policy implementation'. The results will be presented using the cost-effectiveness plane where the x-axis is incremental QALYs and the y-axis is incremental costs. The cost-effectiveness threshold of 160,000 THB per QALY gained will be used as the threshold to determine the value for money of each policy option as recommended by the Subcommittee for Development of Benefits Package and Service Delivery, the National Health Security Office (NHSO).

One-way sensitivity analysis and probabilistic sensitivity analysis of parameters used in the model will be conducted to capture parameter uncertainty in the model. The discount rate of 0 – 6% will be used to observe any changes in the conclusion of results as recommended in the Thai health technology assessment guideline.

Expected outcomes of this study

Policy recommendation on the 'best buy' options to reduce sodium intake among the Thai population

Timeline

Project Activities	Time Frame (Month)					
	1	2	3	4	5	6
Literature review	↔					
Stakeholder consultation meetings with key informants: protocol development	↔	↔				
Planning for data collection	↔	↔				
Constructing an economic model		↔	↔	↔		
Data collection		↔	↔	↔		
Conducting economic analysis			↔	↔		
Stakeholder consultation meetings with key informants: model validations and critique on preliminary findings					↔	
Report and policy brief writing					↔	→
Producing and disseminating reports						↔

Research team

Name	Affiliation and contact details	Qualification	Position
Dr. Pritaporn Kingkaew	Health Intervention and Technology Assessment Program (HITAP) **Email:** pritaporn.k@hitap.net	B.Pharm, MSc (Health Economics), PhD	Principal investigator
Dr. Pattara Leelahavarong	Health Intervention and Technology Assessment Program (HITAP) **Email:** pattara.l@hitap.net	BSc (Pharmacy), MSc (Pharmacy administration), PhD (Health Economics)	Co-researcher
Miss Wilailak Saengsri	Health Intervention and Technology Assessment Program (HITAP) **Email:** wilailak.s@hitap.net	B.Sc. (European Public Health)	Co-researcher
Miss Phorntida Hadnorntun	Health Intervention and Technology Assessment Program (HITAP) **Email:** phorntida.h@hitap.net	Pharm.D	Co-researcher
Miss Juthamas Prawjaeng	Health Intervention and Technology Assessment Program (HITAP) **Email:** juthamas.p@hitap.net	Pharm.D	Research assistant

Health Intervention and Technology Assessment Program (HITAP)
6th floor, 6th building, Department of Health, Ministry of Public Health, Tiwanon road, Nonthaburi 11000, Thailand
Tel: +66-2-590-4549
Fax: +66-2-590-4369

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