

5th Emerging Health Policy Research Conference

Cost-effectiveness of tobacco control policies in Vietnam

~ Population vs. individual approaches ~

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- ❑ Developing countries are facing changes in disease patterns
 - Communicable disease → Non-communicable disease
- ❑ Top 10 causes of global deaths in 2030 is projected to be dominated by non-communicable diseases
 - 1st Ischemic heart disease
 - 2nd Stroke
 - 3rd COPD
 - 4th Lower respiratory infections
 - 5th Road traffic accident
 - 6th Lung cancer
 - 7th Diabetes
 - 8th Hypertensive heart disease
 - 9th Stomach cancer
 - 10th HIV/AIDS
- ❑ One common risk factor stands out among many leading causes of death, which is tobacco smoking

World Health Statistics 2008. Geneva: WHO; 2008

- ❑ Male smoking prevalence is one of the highest in the world

Male: 50–60% Female: 1–5%

- ❑ National tobacco control policy 2000-2010

- ❑ Tobacco control interventions

Intervention	Level of implementation
Excise tax on cigarettes	Ad valorem, 65% since 2008
Total advertisement ban	Comprehensive, well observed
Warning label on cigarette packs	Text only
Media campaign	Limited
Smoke-free legislation	Limited, weak compliance
Smoking cessation support	Limited (almost non-existent)

To provide the policy makers with the evidence on the cost-effectiveness of interventions to reduce tobacco related morbidity and mortality in Vietnam

- ❑ Research design: **Economic evaluation (cost-effectiveness)**
- ❑ Base population: **≥ 15 years of age in 2006**
- ❑ Perspective: **Government perspective (and healthcare perspective for individual cessation support)**
- ❑ Model: **Markov (multiple cohort, multi-state life table)**
- ❑ 10 interventions were examined

Population-level interventions	Individual cessation support
Excise tax increase	Physician brief advice
Pictorial warning label on cigarette packs	Nicotine replacement (patch)
Mass media campaign	Nicotine replacement (gum)
Smoking ban (public place)	Bupropion
Smoking ban (work place)	Varenicline

- Diseases include:
 - Cardiovascular disease (ischemic heart disease, stroke)
 - Cancer (lung, mouth/oropharynx, oesophagus, pancreas, bladder, stomach)
 - Chronic Obstructive Pulmonary Disease
 - Lower respiratory tract infection
- Population-level interventions:
 - Discourage smoking uptake
 - Encourage smoking cessation
- Individual smoking cessation support:
 - Encourage smoking cessation

- ❑ Population: **Census 1999, population change survey 2006**
- ❑ Smoking rate: **Living standard survey 1993, 1998, 2006**
- ❑ Outcome measure: **Disability-adjusted life year (DALY)**
- ❑ Intervention effect: **Literature**
- ❑ Intervention cost: **State budget regulation, government expenditure, literature**
- ❑ Disease parameter: **Burden of disease study 2006**
- ❑ Cost-effectiveness measurement: **Incremental cost-effectiveness ratio (ICER) expressed as cost per DALY averted**
- ❑ Discount rate: **3% for both cost and effect**
- ❑ Uncertainty analysis: **Monte Carlo simulation (2,000 iterations)**

RESULTS (Population level)

Unit: VND per DALY averted

Intervention	ICER	
	Median	95% UI
Pictorial warning label on cigarette packs	500	300 – 1,200
Excise tax increase (55% to 75%)	4,200	1,700 – 9,900
Smoking ban in public places	67,900	28,200 – 332,000
Mass media campaign	78,300	43,700 – 176,300
Smoking ban in work places	336,800	169,300 – 822,900

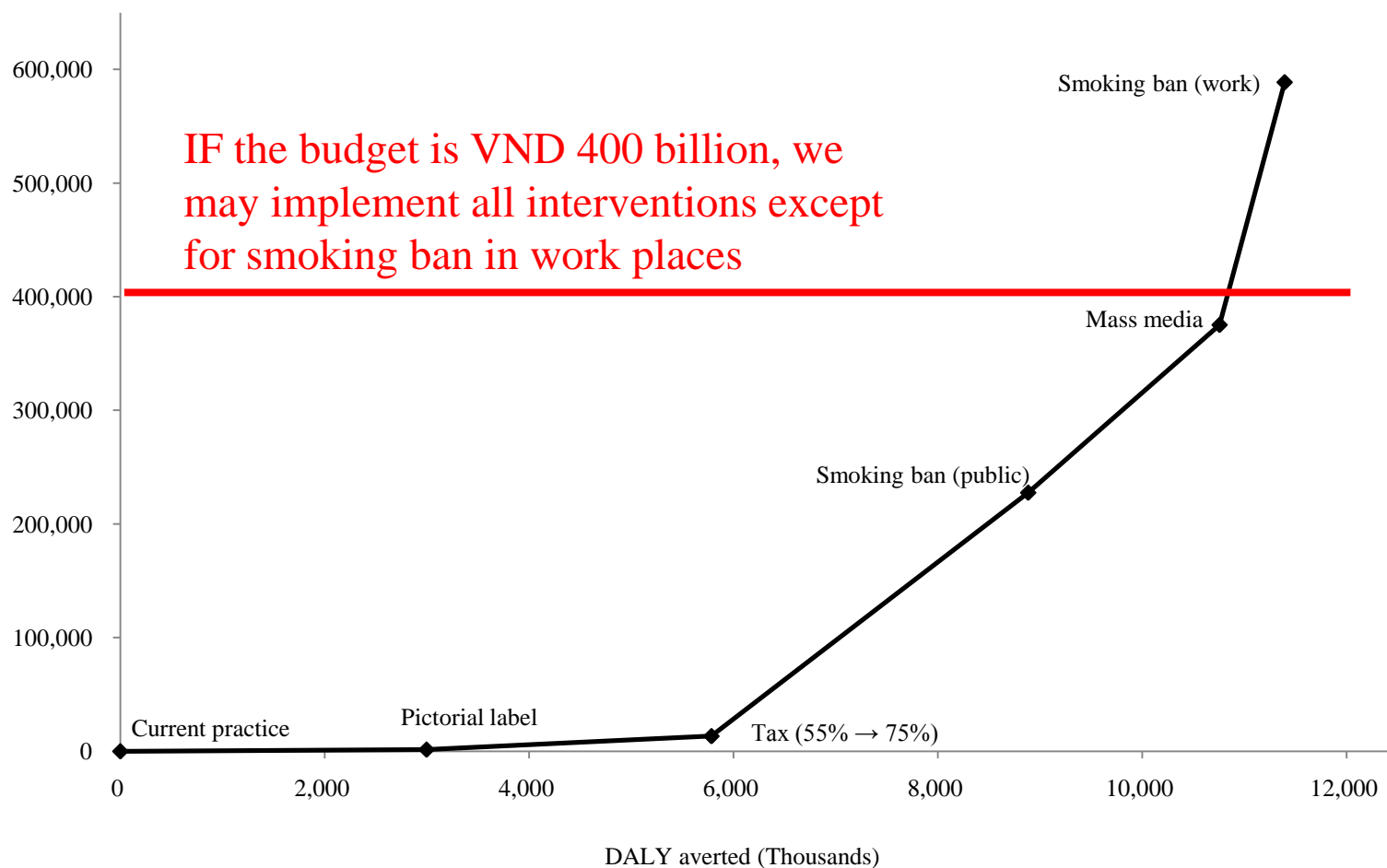
UI: uncertainty interval; AUD 1 \approx VND 11,600 (2006)

Threshold: very cost-effective (<GDP/capita)

VND 11,500,000 per DALY averted
 \approx AUD 990 per DALY averted

EXPANSION PATHWAY (Population level)

Cost (VND Millions)



PRELIMINARY RESULTS (Individual level)

Unit: VND Thousands per DALY averted

Intervention	ICER (Scenario 1)		ICER (Scenario 2)	
	Median	95% UI	Median	95% UI
Physician brief advice	670	410 – 1,100	–	–
Varenicline	41,600	25,300 – 69,100	26,300	13,300 – 43,400
Bupropion	64,900	40,200 – 104,000	21,600	12,900 – 33,400
Nicotine replacement (patch)	108,000	68,000 – 166,000	106,000	65,800 – 167,000
Nicotine replacement (gum)	143,000	88,700 – 223,000	40,800	24,600 – 64,000

Scenario 1: Australian Pharmaceutical Benefit Scheme 2006 price (N/A for brief advice)

Scenario 2: price from MIMS online or Thailand MOPH data base

(NRT patch - Hong Kong; NRT gum - Thailand; Bupropion - Vietnam; Varenicline - Thailand)

UI: uncertainty interval; AUD 1 ≈ VND 11.6 thousand (2006)

Threshold: very cost-effective (<GDP/capita)

VND 11,500 thousand per DALY averted

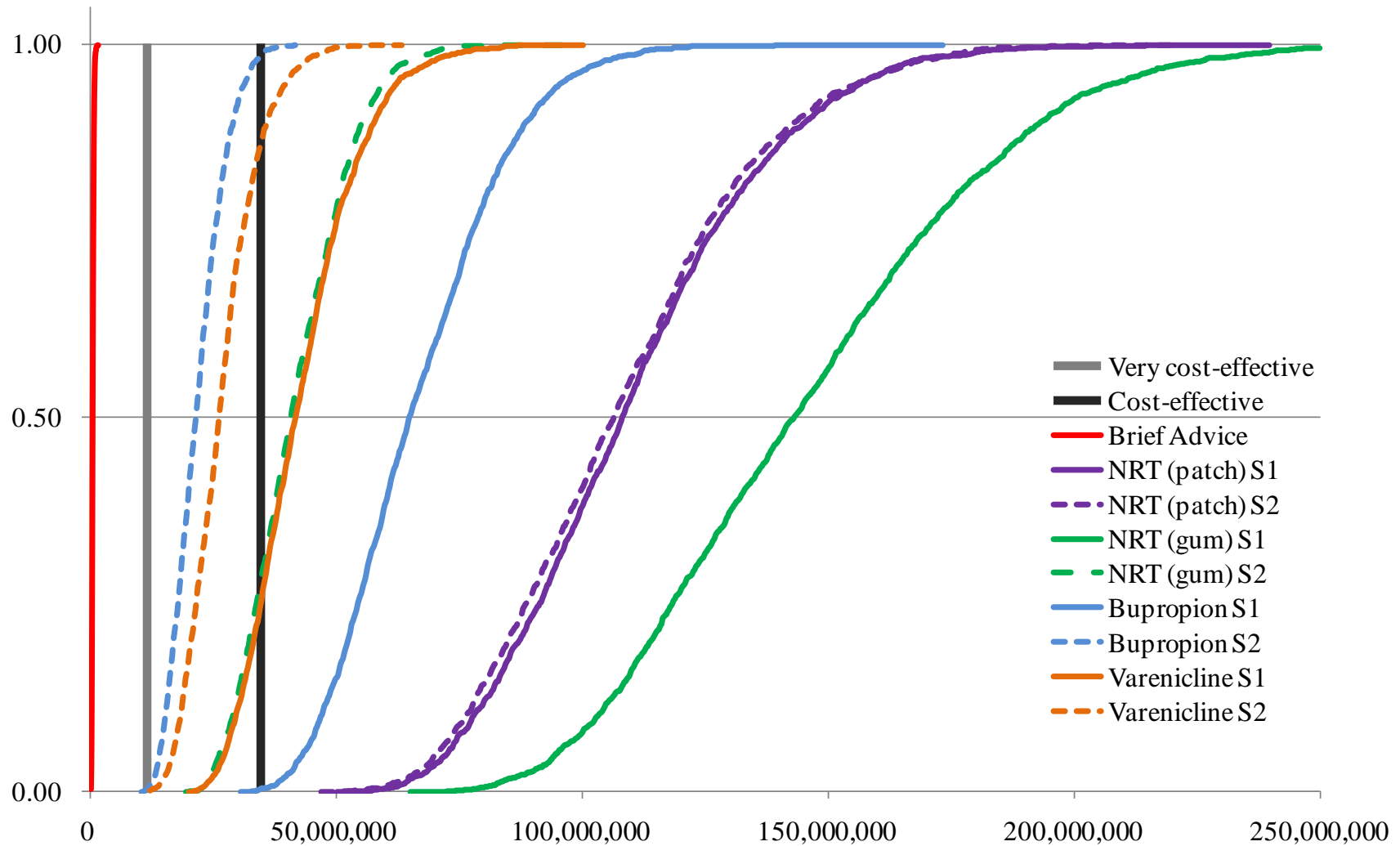
≈ AUD 990 per DALY averted

Threshold: cost-effective (<GDP/capita*3)

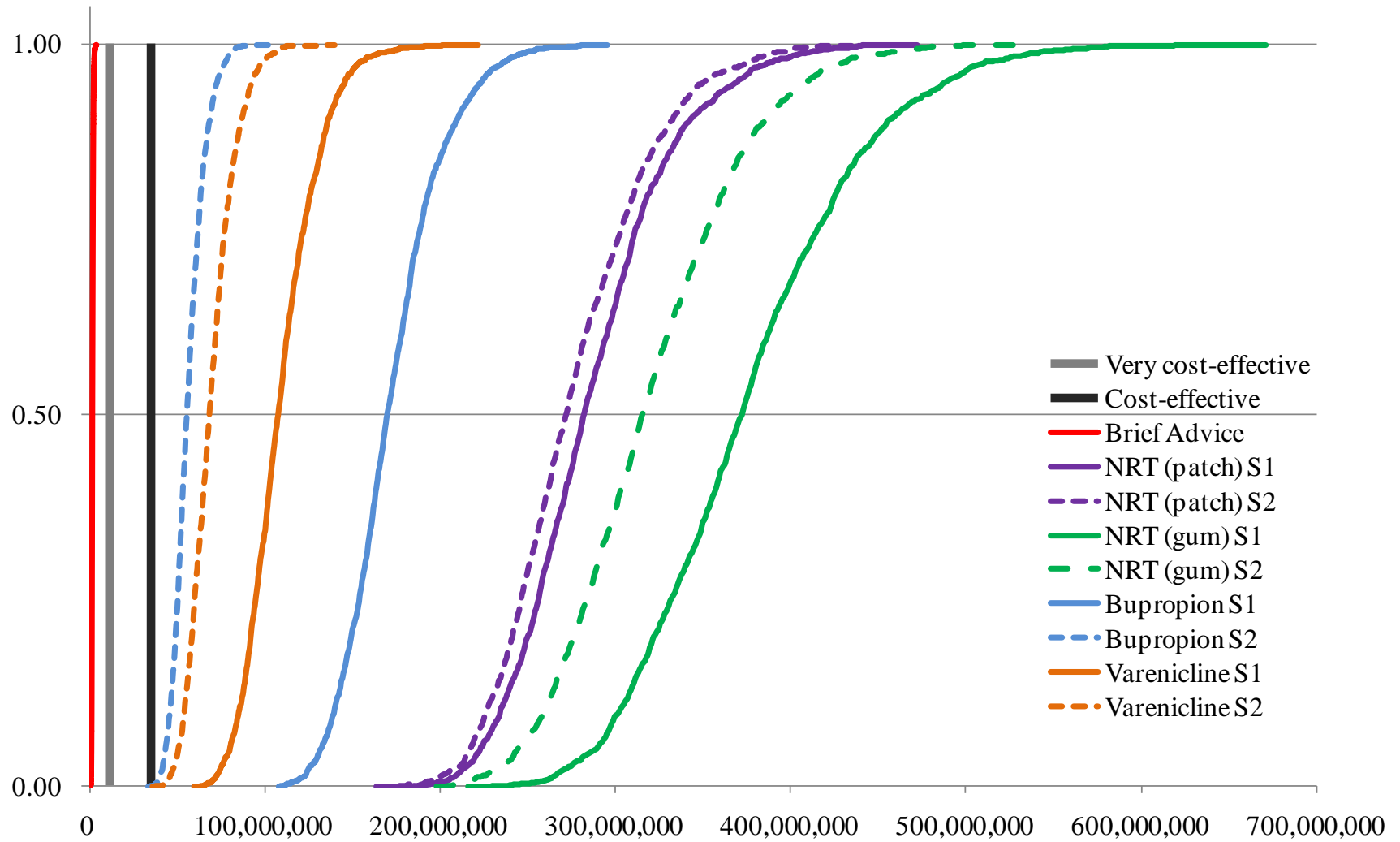
VND 34,600 thousand per DALY averted

≈ AUD 2,980 per DALY averted

COST-EFFECTIVENESS ACCEPTABILITY CURVE (Individual level) *government perspective*



COST-EFFECTIVENESS ACCEPTABILITY CURVE (Individual level) *healthcare perspective*



THRESHOLD ANALYSIS (Pharmacological therapies)

- Threshold analysis: To determine the price levels of pharmaceuticals at which the probability of being cost-effective become 0.50 (± 0.03)

Intervention	Government perspective		Healthcare perspective	
	% PBS	Price (AUD)	% PBS	Price (AUD)
Varenicline	83.0%	260	31.0%	97
Bupropion	54.0%	139	19.5%	50
Nicotine replacement (patch)	31.0%	128	11.8%	49
Nicotine replacement (gum)	24.0%	85	8.7%	31

%PBS: % of Australian Pharmaceutical Benefit Scheme 2006 price for a recommended course
Price: AUD 2006 value for the whole course of therapy; AUD 1 \approx VND 11,600 (2006)

- All interventions at population-level are “very cost-effective”

Should be considered as priority for tobacco control policy

- Physician brief advice is the only “very-cost effective” option for individual smoking cessation support

Should be considered as priority for tobacco control policy

- NRT is “not cost-effective”. Bupropion and Varenicline are “cost-effective” with government perspective, but not with healthcare perspective (including about 60% out-of-pocket payment)

Pharmacological therapy is not recommended at present, unless pharmaceuticals would be locally produced at substantially lower costs in the future

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