

# POSB167: Cost-Effectiveness of Tobacco Control Strategies in Indonesia

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## 1 Background

- Smoking is the world's leading cause of preventable morbidity and mortality. Prevalence of smoking in Indonesia is 39.4%. The high prevalence of smoking in Indonesia is driven by men (76.1%)<sup>1</sup>. Indonesia is the only country in South East Asia not to have joined the WHO Framework Convention of Tobacco Control (FCTC)<sup>2</sup>.
- Given the significant role of the tobacco industry in Indonesia, tobacco control measures need to be cognisant of the broader economic (and political) ramifications. A few cost-effectiveness studies have been undertaken in South East Asia<sup>3</sup>, but there is none from Indonesia. This is a glaring omission, and as such, information on the cost-effectiveness of anti-smoking strategies are needed to inform further control in Indonesia.

### Aims

- The present study applied epidemiological and economic modelling to predict the effectiveness and cost-effectiveness of three tobacco control interventions in Indonesia:
- government-funded varenicline;
- smoking bans in public places; and
- an additional 10% increase in tobacco tax applied to the purchase price of cigarettes.
- The results will provide information to assist the Indonesian government in managing the large tobacco-related disease burden.

## 2 Methods

- A Markov model with two health states ('Alive' and 'Dead') and one-year cycles was developed<sup>4</sup>. The model simulated follow-up of Indonesians from age 15-84 years with a follow-up until age 85 years (life time horizon). The model was conducted from the perspective of the Indonesian healthcare system and costs and benefits accrued beyond one year were discounted at a 3% per annum.
- The main outcome of interest of the economic evaluation was incremental cost-effectiveness ratio (ICER) in terms of cost per QALY gained and cost per year of life saved (YoLS).

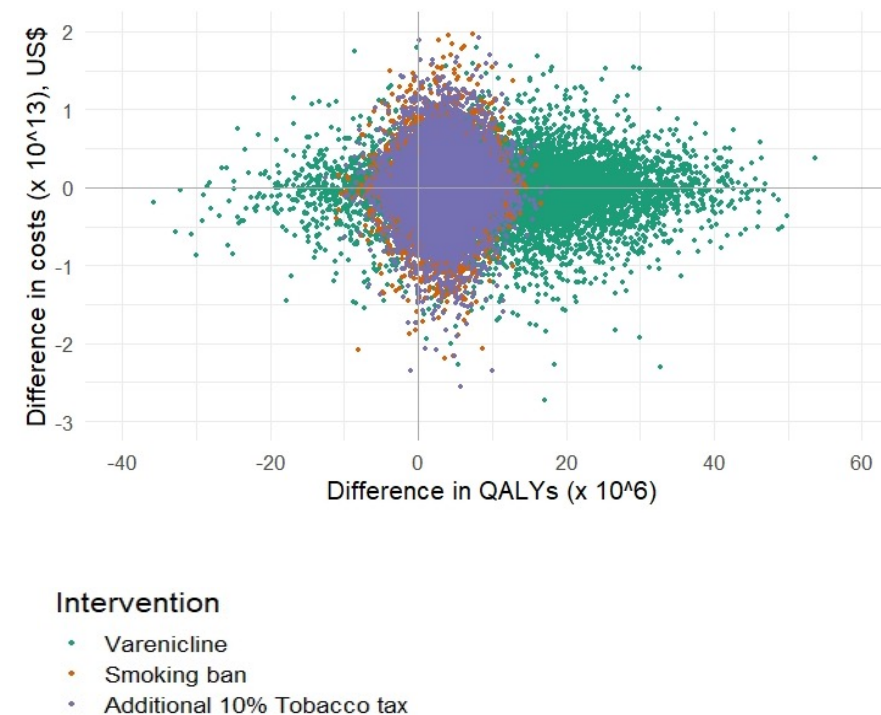
## 3 Results

- From the perspective of the Indonesian healthcare system, all three strategies will be dominant options (cost saving) in health economic terms. Overall, the findings represented in the sensitivity analysis showed that the base case results were robust.

**Table 1. Base case results of the projected smoking-related healthcare costs of the current situation compared to varenicline, a smoking ban and an additional 10% tobacco tax.**

|                                                                         | Smoking-Related Healthcare Expenditure | Cost of interventions  | Total Healthcare Costs | ICER (\$ per YoLS) | ICER (\$ per QALY gained) |
|-------------------------------------------------------------------------|----------------------------------------|------------------------|------------------------|--------------------|---------------------------|
| Current situation                                                       | \$2,868,426,260,361                    | \$0                    | \$2,868,426,260,361    |                    |                           |
| Varenicline                                                             | \$2,534,411,117,765                    | \$20,122,666,197       | \$2,554,533,783,962    |                    |                           |
| Differences between the current situation and varenicline               |                                        |                        |                        |                    |                           |
|                                                                         | -\$334,015,142,596                     | \$20,122,666,197       | -\$313,892,476,399     | Dominant           | Dominant                  |
| Smoking Ban                                                             | \$2,770,899,767,509                    | \$3,722,131,495        | \$2,774,621,899,004    |                    |                           |
| Differences between the current situation and a smoking ban             |                                        |                        |                        |                    |                           |
|                                                                         | -\$97,526,492,852                      | \$3,722,131,495        | -\$93,804,361,357      | Dominant           | Dominant                  |
| Tobacco Tax                                                             |                                        |                        |                        |                    |                           |
|                                                                         | Smoking-Related Healthcare Expenditure | Additional Tax Revenue | Net Societal Costs     | ICER               | ICER                      |
| Tobacco Tax                                                             | \$2,762,294,488,728                    | \$41,825,349,668       | \$20,736,502,200,434   |                    |                           |
| Differences between the current situation and an additional tobacco tax |                                        |                        |                        |                    |                           |
|                                                                         | -\$106,131,771,633                     | \$41,825,349,668       | \$154,547,902,147      | Dominant           | Dominant                  |

**Figure 1. Cost effectiveness plane, displayed using a Monte Carlo simulation with 10,000 iterations comparing three interventions to the current situation in Indonesia. QALYs-quality adjusted life years.**



## 4 Conclusion

- Government-funded varenicline, a ban on smoking in public places and an additional 10% tobacco tax are highly likely to be cost-effective, and even cost saving from the perspective of the healthcare system in Indonesia. However, their health and cost benefits need to be balanced against broader economic losses that would result from the impact on the large Indonesian tobacco industry.
- At stake is the health and well-being of the many millions of Indonesian smokers, and indeed their 270 million total population.

### References:

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- The WHO FCTC: a global health treaty.
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