Projections for smoking prevalence in New Zealand: Business-as-usual and with increased tobacco tax

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bode^3 Burden of Disease Epidemiology, Equity and Cost Effectiveness Programme

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Background

- Ikeda et al (2013) – Smoking prevalence projections to 2025 and beyond: <5% smoking prevalence will not be achieved
- Census 2013 – daily smoking prevalence has fallen substantially:
  - from 20.7% to 15.1% for the general NZ population
  - from 42.2% to 32.7% for Māori (nearly 10 percentage points!)

Objective

- To project future smoking prevalence in NZ by sex and ethnicity using data from 2006 and 2013 censuses
  - under business-as-usual (BAU) trends: assuming no further tax increases after 2014
  - by updating the previously used tobacco forecasting model (Ikeda et al, 2013)

Methods

- A dynamic forecasting tobacco model previously built for Australia[1] was adapted for NZ by Ikeda et al (2013)[2] and adjusted for this update

- A Markov model designed in MS Excel
  - Input data (by age, sex, and ethnicity)
    - Smoking prevalence data from the 2006 and 2013 NZ Census[3]
    - Annual birth projections
    - Annual trends in mortality rates
    - Relative risks of mortality for current and former smokers from NZCMS[4]

1. Gartner et al. *Tob Control* 2009;18:183-9.
2. Ikeda et al. *Tob Control* doi:10.1136/tobaccocontrol-2013-051196
3. Cobiac et al 2014. *Tob Control*
4. Blakely et al. N Z Med J 2010;123(1320):26-36

Methods – continued

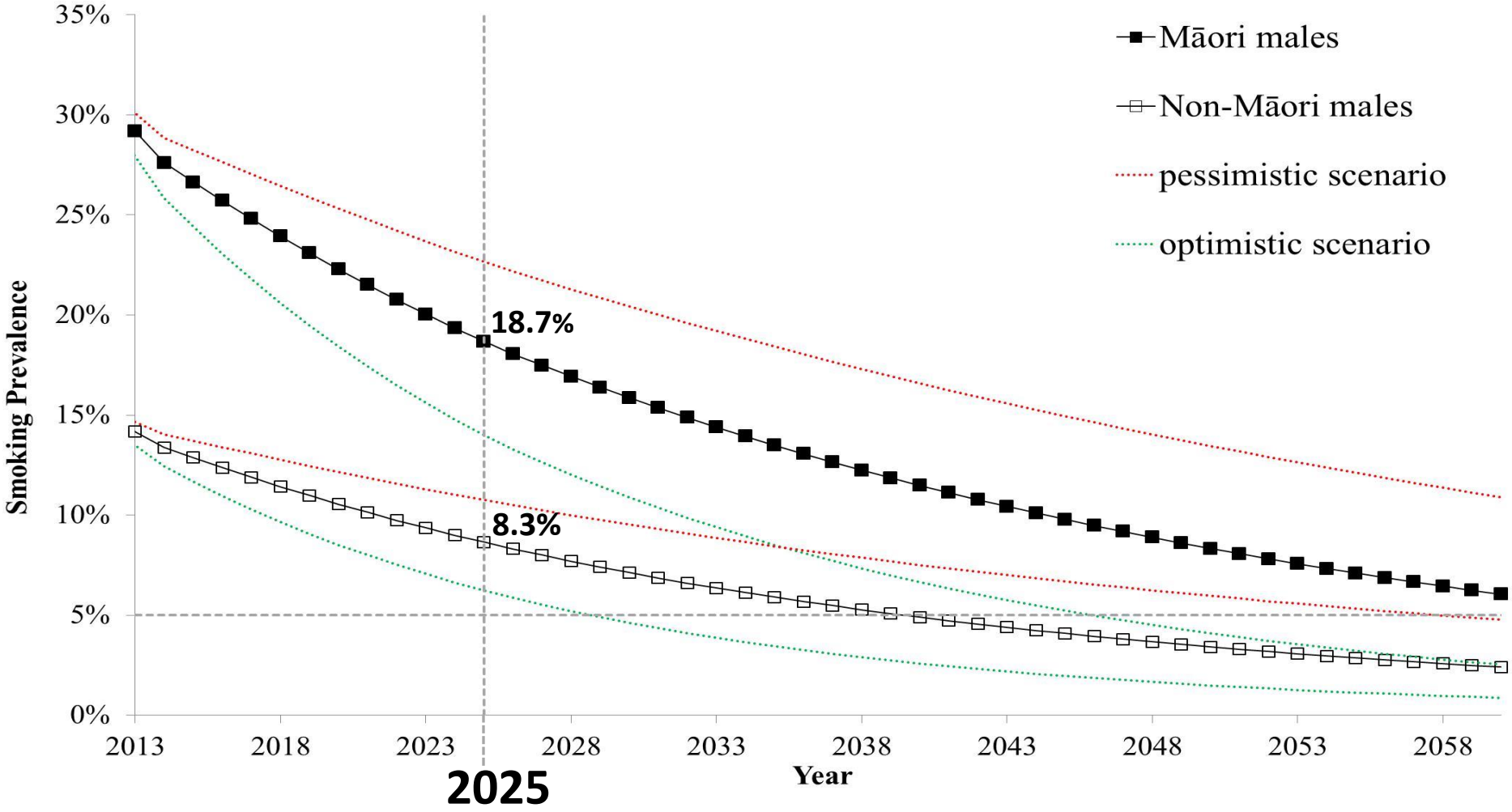
- Trends in annual smoking initiation and cessation by sex and ethnicity were established using 2006 and 2013 census smoking prevalence data
  - "Initiation" = the annual percentage decline in uptake in 20 year olds
  - "Cessation" = the annual net cessation rate (balance of number of quit attempts, success of each quit attempt, and relapse)

- Initiation and cessation rates were adjusted for no tax rises since 2010 using age-varying price elasticities (see methods in Cobiac et al, 2014)

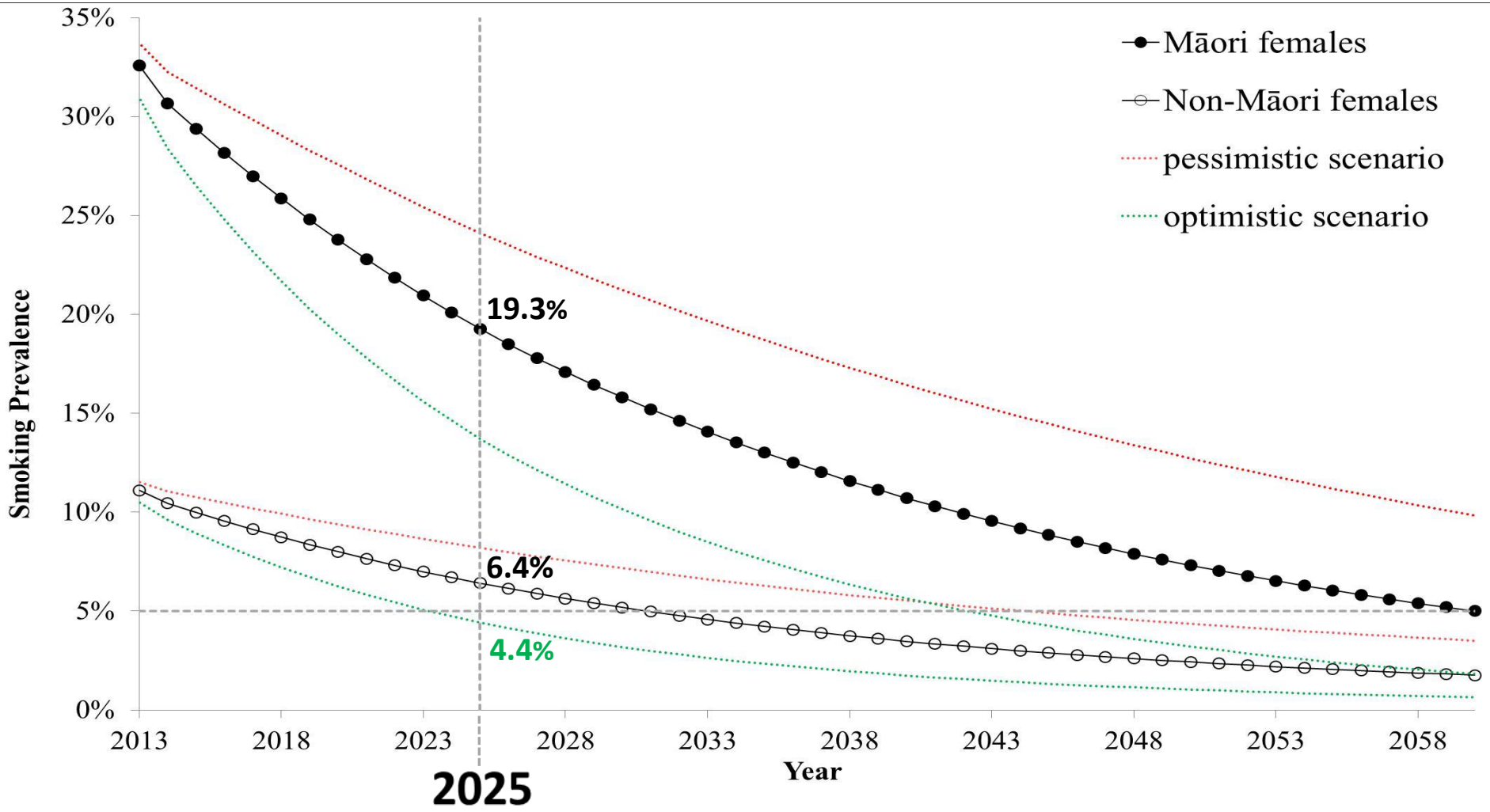
- Adjusted initiation & cessation rates were used to project smoking prevalence under BAU trends in NZ to 2025 (and beyond)
  - Adding back in the 'tax effect' until 2014

- Full methods in van der Deen et al (*NZ Med J* 2014)

Results: Smoking prevalence projections – men



Smoking prevalence projections – women



Intermediate conclusion

- The 2025 goal is not achieved by any group under the projected annual trends in initiation and cessation (assuming no further tax rises after 2014)
- Thus, time to explore scenarios that go beyond business-as-usual:
  - E.g. Ongoing 10% (and more) per annum increases in tax

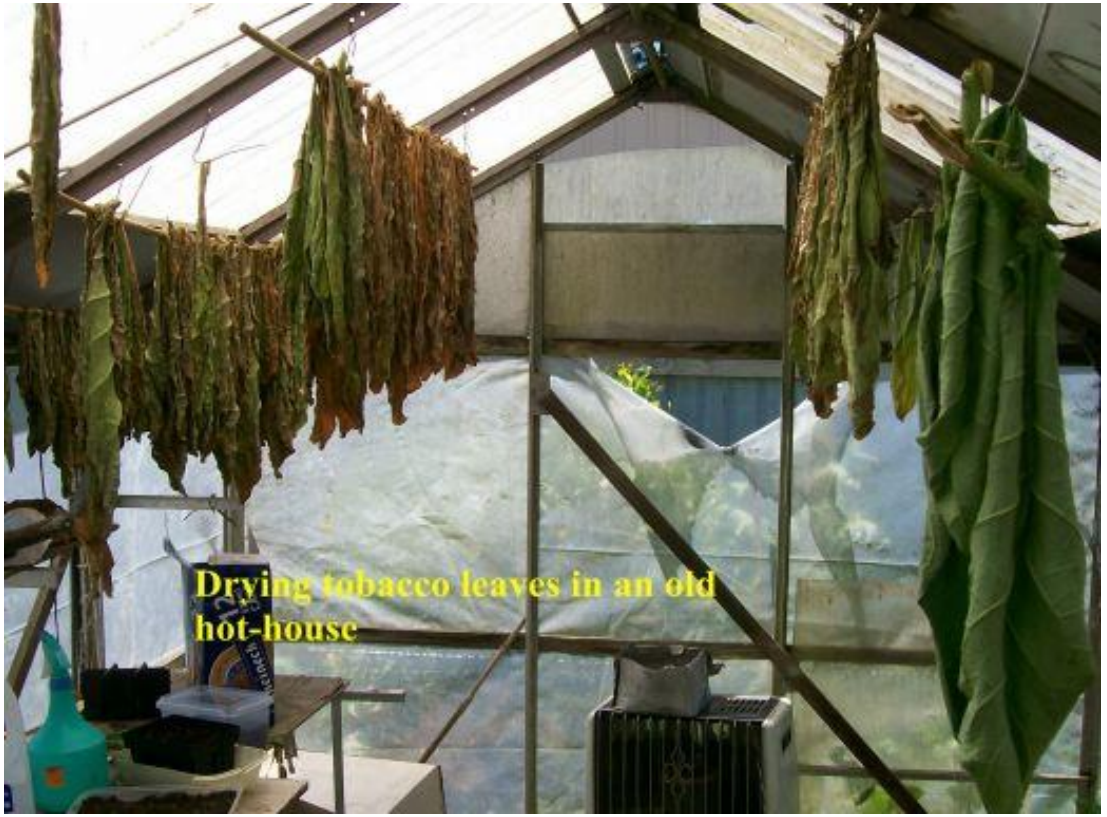
Tobacco taxes and smoking prevalence

1. Cobiac, L., T. Ikeda, N. Nghiem, T. Blakely and N. Wilson (2014). "Modelling the implications of regular increases in tobacco taxes as a tobacco endgame strategy." Tobacco Control.

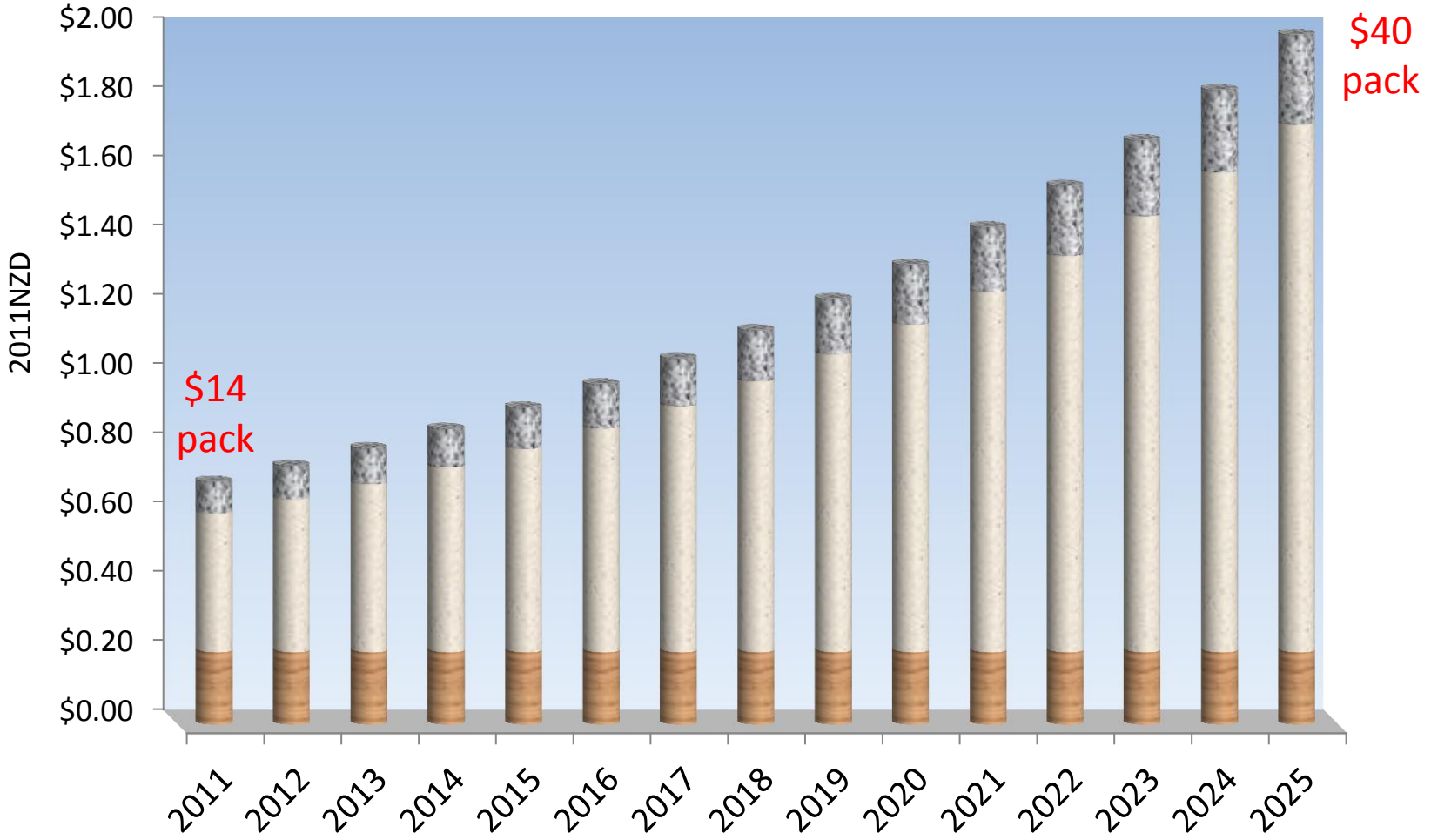
The average (legal) price of a cigarette

2011 New Zealand dollars

Wider tobacco market: Marlborough (NZ) man selling tobacco seeds on Trade Me (2010) – but probably a very niche pursuit?



Cigarette price projections with 10% tax



Tobacco taxes in New Zealand

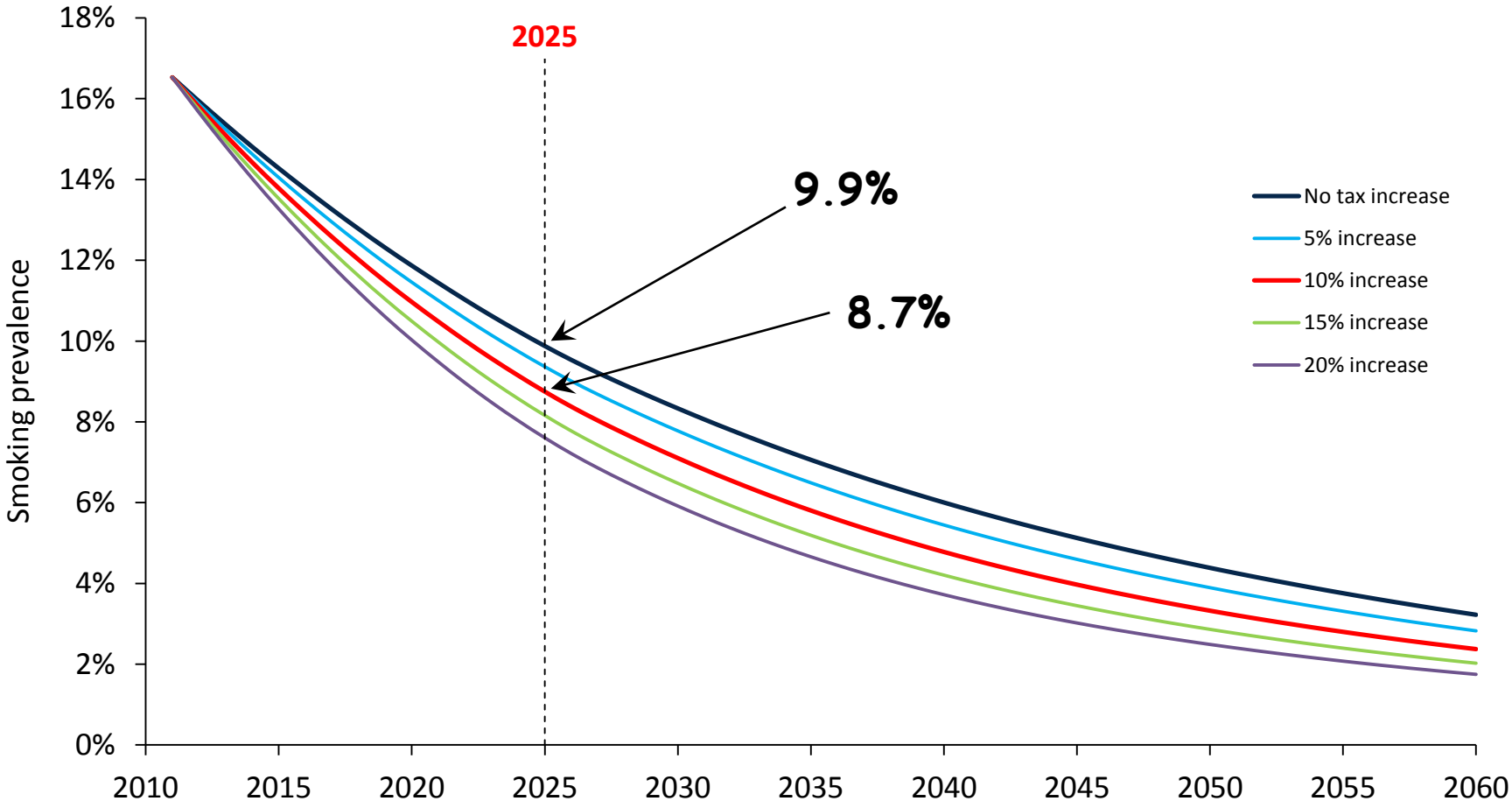
1. Will 10% annual tax increases be enough to reach <5% prevalence by 2025?
2. Could growth in the illicit tobacco market undermine the benefits of tax increases?

How do people respond to increasing price?

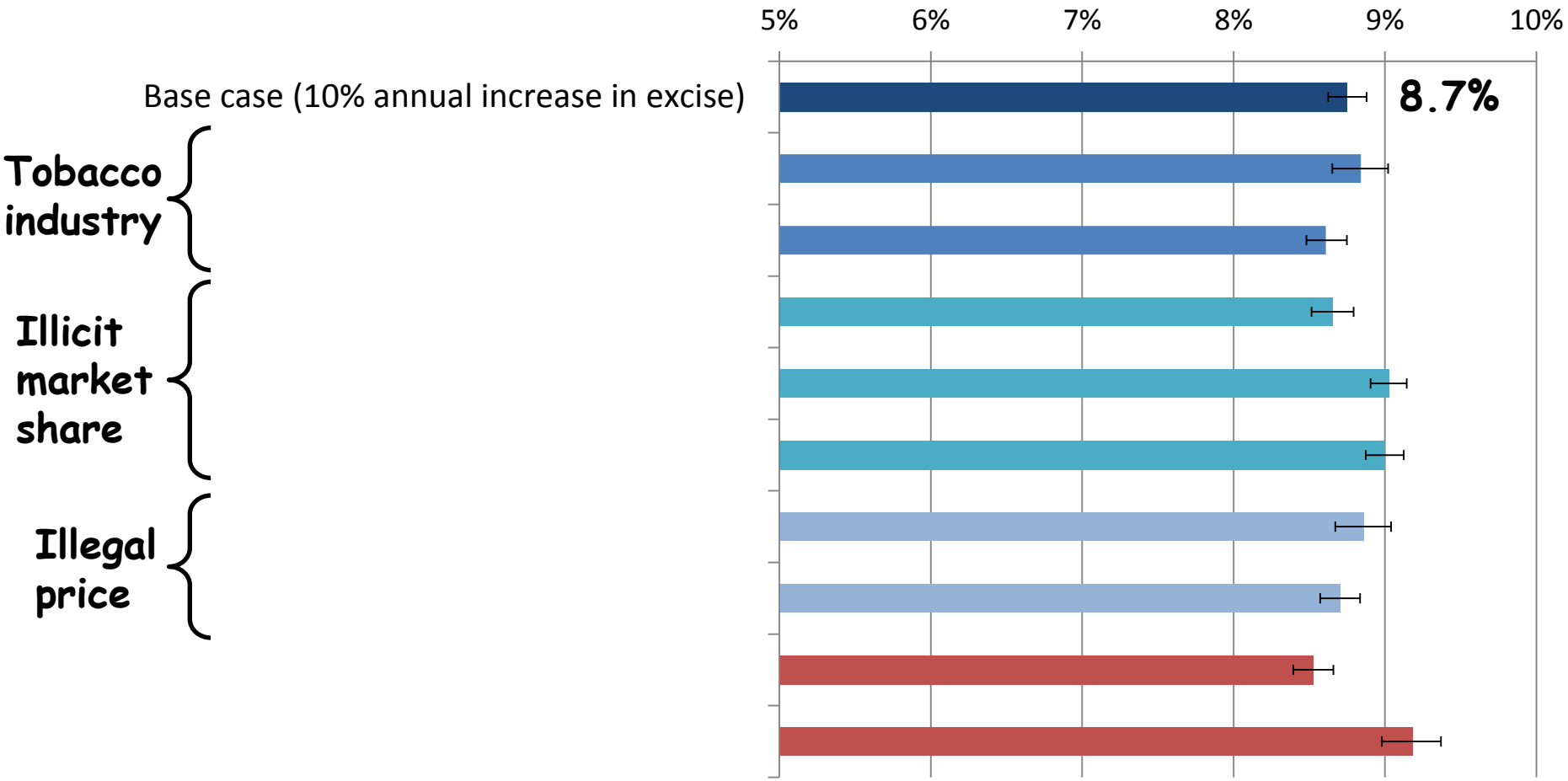
- More smokers quit (or fewer young people start)
- Smokers cut-down on number of cigarettes smoked

- Response is measured by price elasticity
  - International review (IARC 2011): -0.2 to -0.5
  - New Zealand study (Tait et al. 2013): -0.47

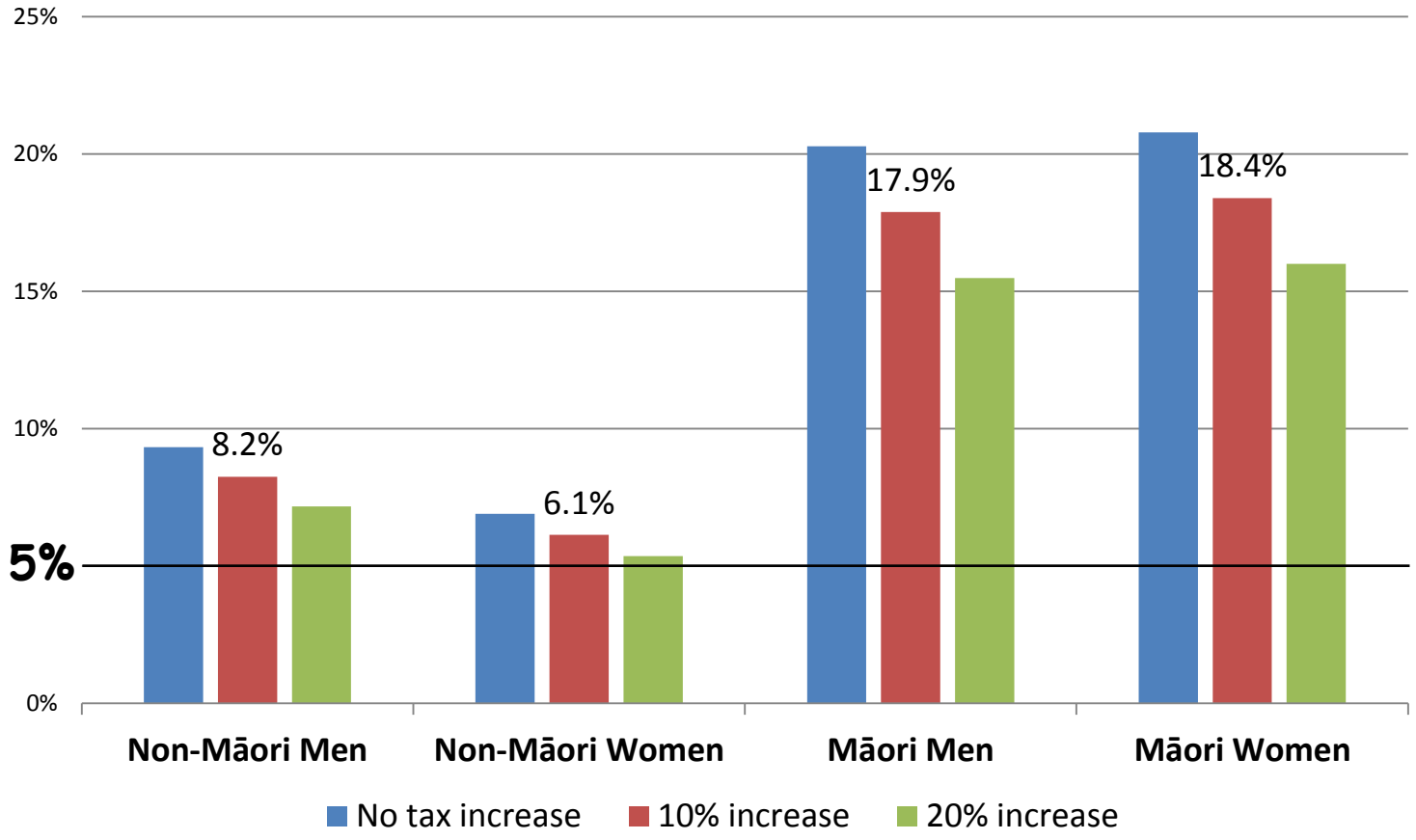
Smoking prevalence projections



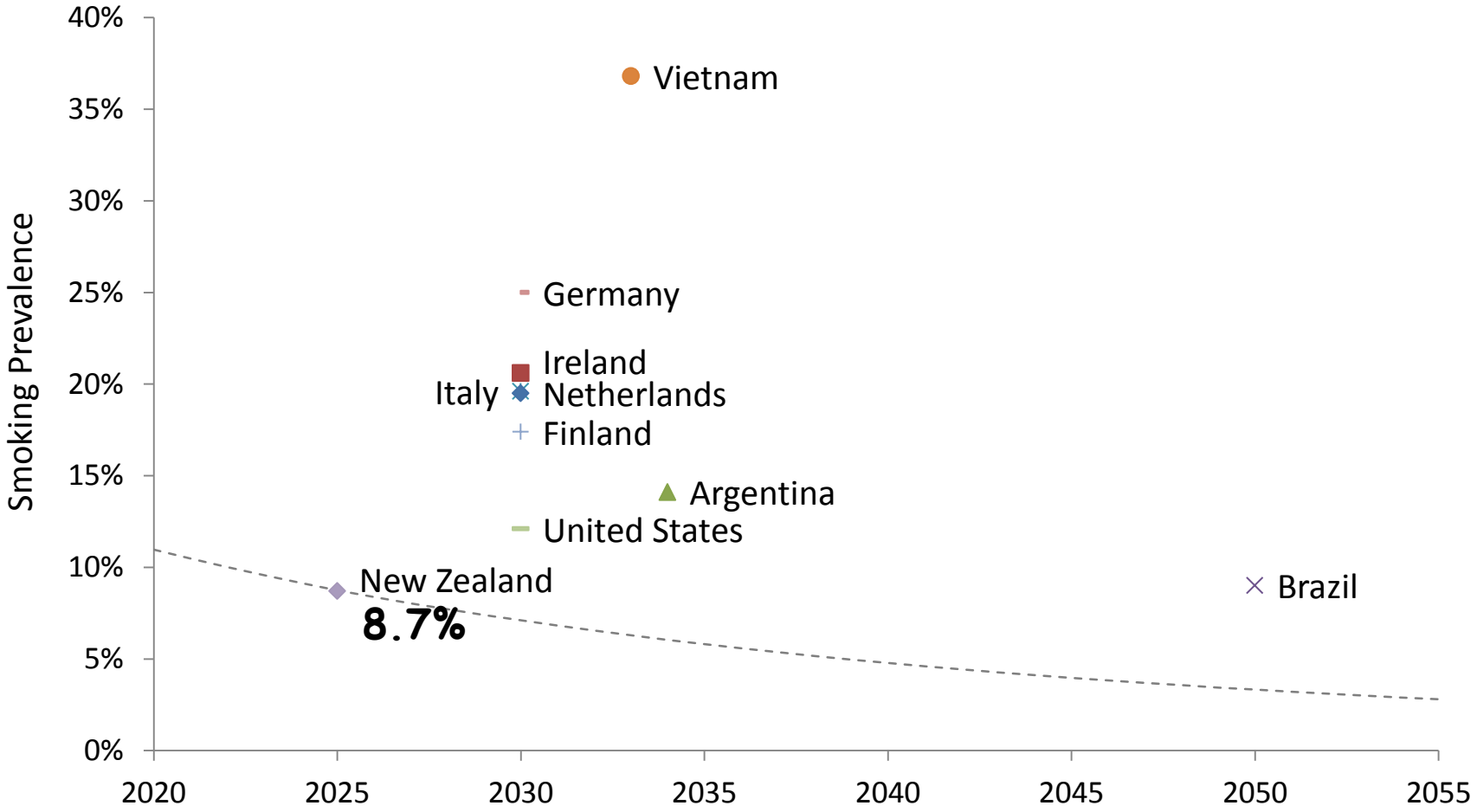
Smoking prevalence in 2025



Smoking prevalence in 2025



Smoking projections (with tax) in other countries



Conclusions (part 1)

- The 2025 goal is not achieved by any group under the projected annual trends in initiation and cessation (assuming no further tax rises after 2014)
  - Large inequalities in smoking prevalence are projected to remain
- Only in a scenario with relatively optimistic changes in initiation and cessation rates, non-Maori women are forecasted to achieve a prevalence under 5% by 2025
- Required: More interventions beyond business-as-usual

Conclusions (part 2)

- Regular increases in tax appear to:
  - also not be enough to achieve the 2025 prevalence goal
  - not be likely to be undermined by illicit trade

- Tobacco tax is essential part of tax control, but:
  - If we are to achieve 5% prevalence by 2025, more radical policies are needed (eg, denicotinisation, major outlet reduction)