



Why is adolescent smoking declining?

Jude Ball, PhD

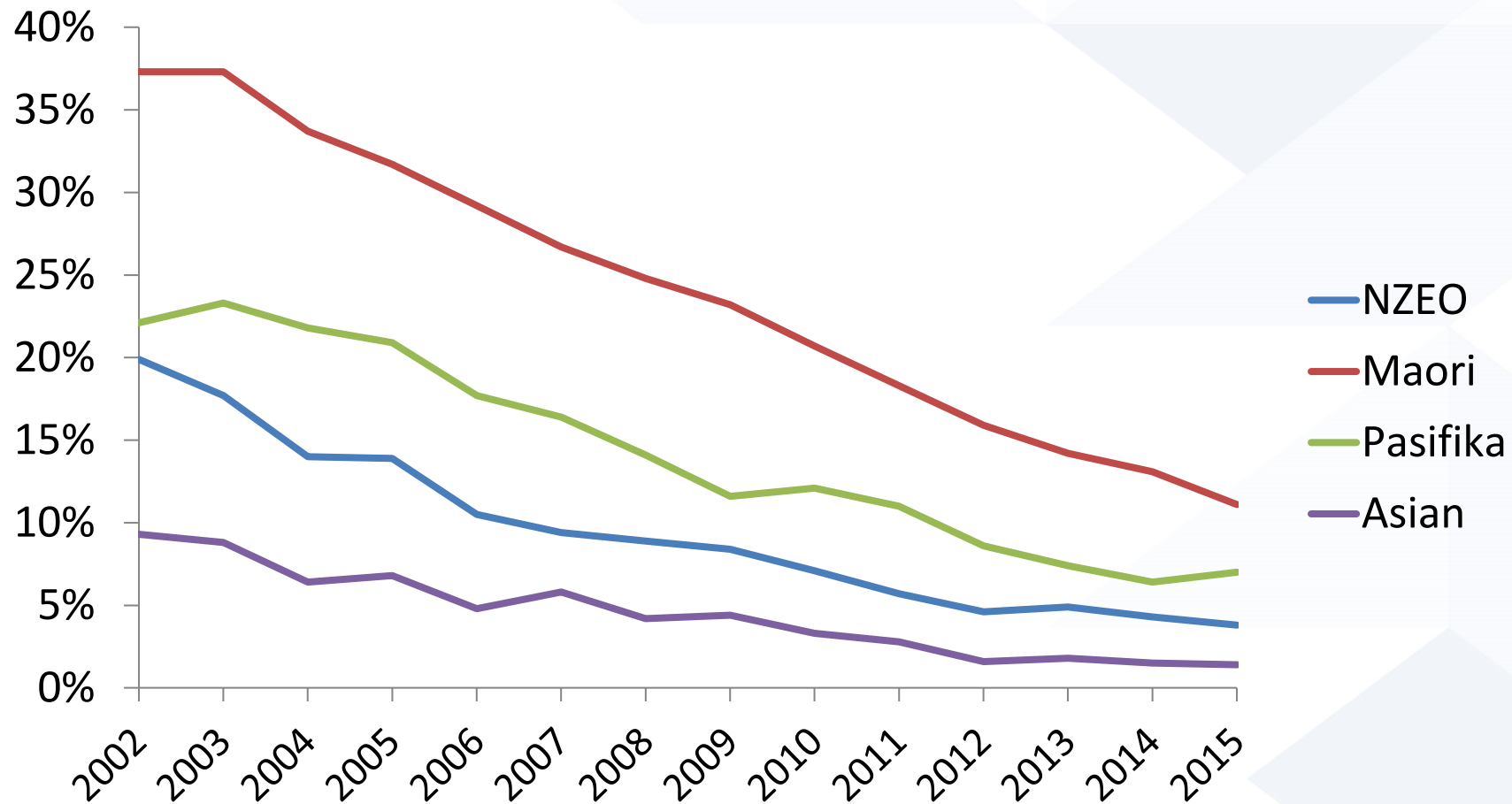
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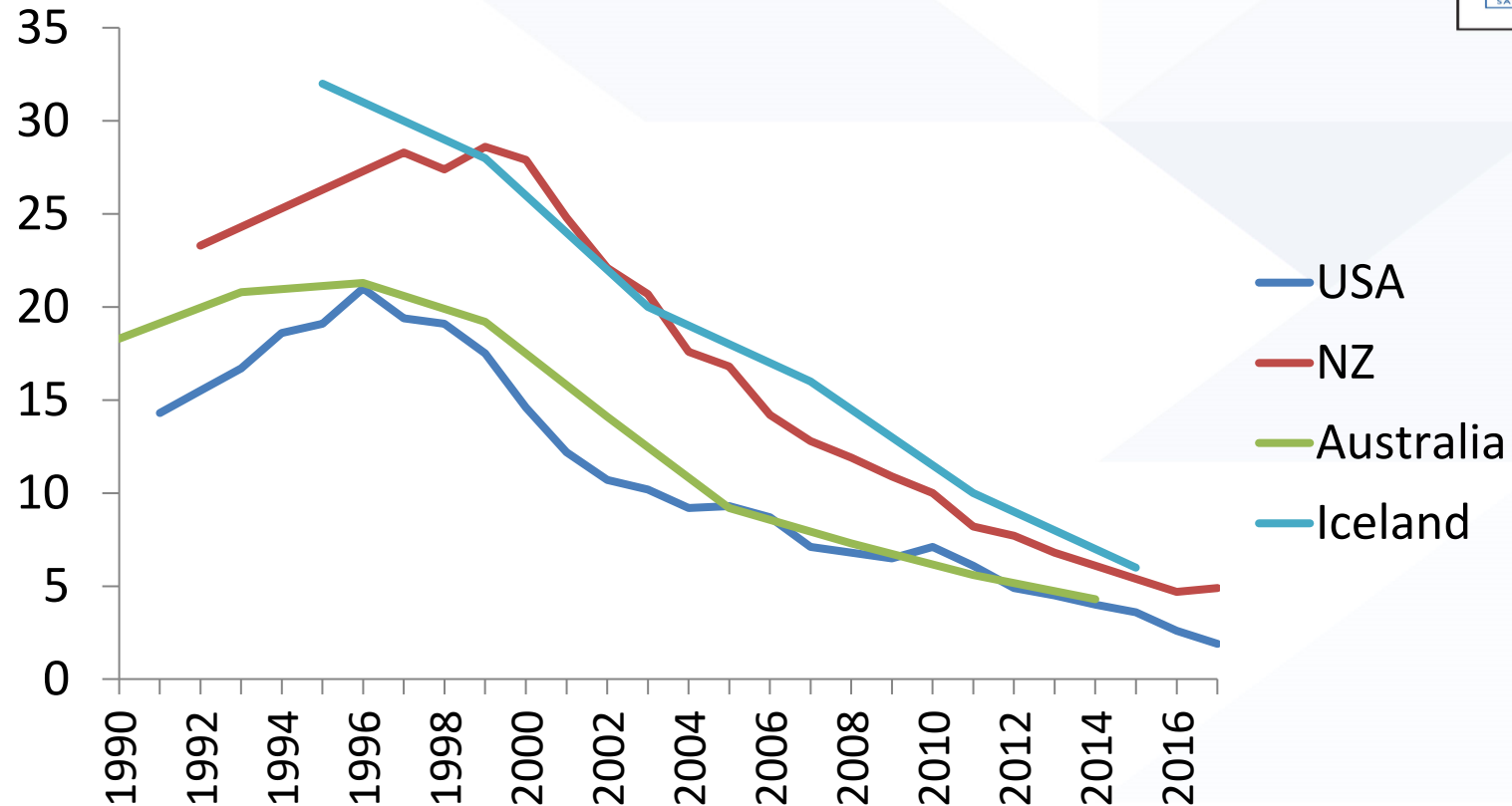
Prevalence of regular smoking, New Zealand, 2002-15

Year 10 (14-15 years old) by ethnicity



Data source: ASH Year 10 Snapshot Survey.

Prevalence of past month tobacco smoking, 1990-2017



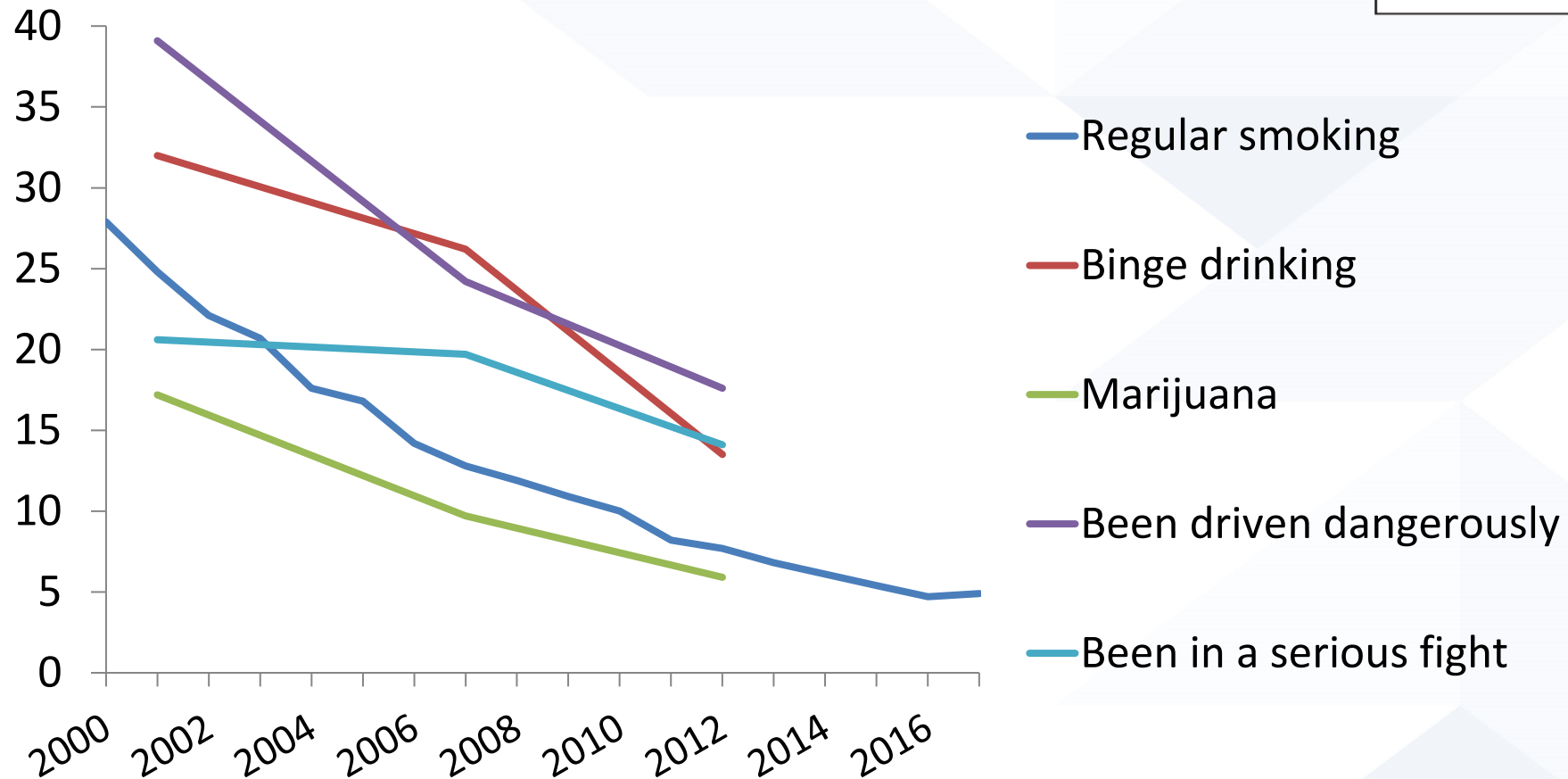
USA: Monitoring the Future, Grade 8, 13-14 years, 30 day prevalence

NZ: ASH Year 10 survey, 14-15 years, at least monthly

Australia: ASSAD, 12-15 year olds , past month

Iceland: ESPAD, 15-16 year olds, 30 day prevalence

Adolescent risk behaviour trends, NZ, 2000-2017



Regular smoking: ASH Year 10, 14-15 year olds, at least monthly

Binge drinking: Youth 2000, 13-15 year olds, at least once in past month

Marijuana: Youth 2000, 13-15 year olds, at least once in past month

Been driven dangerously: Youth 2000, 13-18 years, past month

Been in a serious fight: Youth 2000, 13-18 year olds, past 12 months

Why is adolescent smoking declining?



Study 1. ASH Yr 10 data

- Have changes in known risk factors for teen smoking contributed?

Study 2. Youth 2000 data

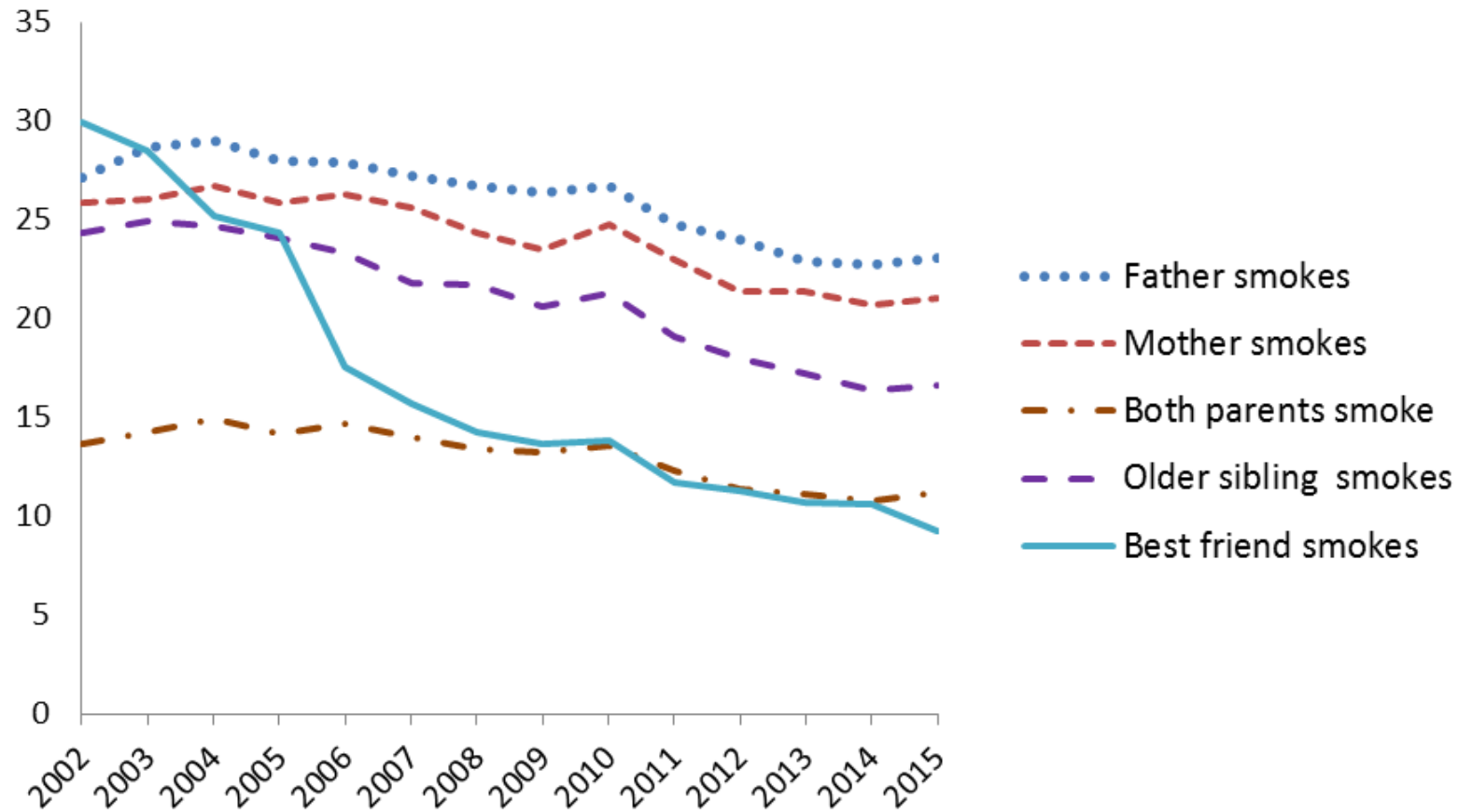
- Have shared risk/protective factors (e.g. school attachment) contributed?
- Have adolescent attitudes and behaviours re substance use contributed?

Study 1. Changes in known tobacco-specific risk factors for teen smoking

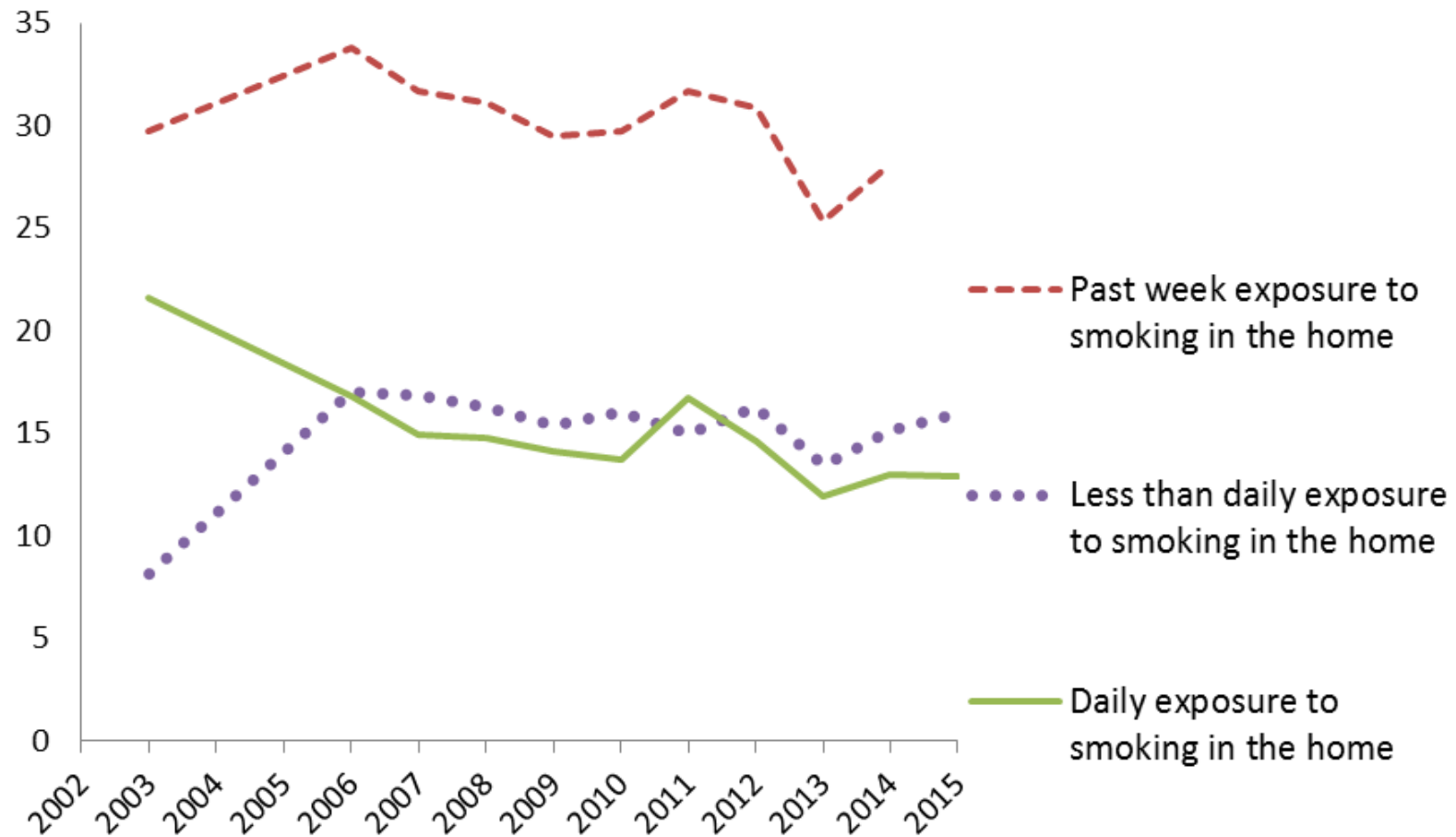


- **Co-authors:** Dalice Sim, Richard Edwards
- **Data:** ASH Yr10 Snapshot Survey, annual
- **Study period:** 2002 - 2015
- **N=** approx. 400,000 14-15 year olds
- **Outcome:** regular (at least monthly) smoking
- **Potential contributors to smoking trends:**
 - Parental smoking
 - Older sibling smoking
 - Best friend smoking
 - Past week exposure to smoking in the home

Trends: prevalence of parental, sibling and best friend smoking



Trends: past week exposure to smoking in the home



Results



	Model 1: OR for Year Partially adjusted (95% CI)	Model 1 + Exposure to smoking in home (95% CI)	Model 1 + Parental smoking (95% CI)	Model 1 + Sibling smoking (95% CI)	Model 1 + Best Friend smokes (95% CI)	Model 1 + all risk factors combined (95% CI)
Linear trend (2003- 2015)	0.88 (0.88, 0.88)					

All models are adjusted for age, sex, ethnicity and school decile.

Trend analysis



	Model 1: OR for Year Partially adjusted (95% CI)	Model 1 + Exposure to smoking in home (95% CI)	Model 1 + Parental smoking (95% CI)	Model 1 + Sibling smoking (95% CI)	Model 1 + Best Friend smokes (95% CI)	Model 1 + all risk factors combined (95% CI)
Linear trend (2003- 2015)	0.88 (0.88, 0.88)	0.88 (0.88, 0.88)	0.88 (0.88, 0.89)	0.88 (0.88, 0.89)	0.91* (0.91, 0.92)	

All models are adjusted for age, sex, ethnicity and school decile.

Trend analysis



	Model 1: OR for Year Partially adjusted (95% CI)	Model 1 + Exposure to smoking in home (95% CI)	Model 1 + Parental smoking (95% CI)	Model 1 + Sibling smoking (95% CI)	Model 1 + Best Friend smokes (95% CI)	Model 1 + all risk factors combined (95% CI)
Linear trend (2003- 2015)	0.88 (0.88, 0.88)	0.88 (0.88, 0.88)	0.88 (0.88,0.89)	0.88 (0.88, 0.89)	0.91* (0.91,0.92)	0.91* (0.90, 0.91)

All models are adjusted for age, sex, ethnicity and school decile.

Study 1: Conclusion



- Adolescent smoking decline was independent of
 - parental smoking,
 - older sibling smoking and
 - exposure to smoking in the home.



Study 2.



- **Data:** Youth 2000 national youth health and wellbeing survey
- **Data owners:** Adolescent Health Research Group, University of Auckland
- **Survey years:** 2001, 2007, 2012
- **N=8,500 – 10,000 per year**
- **Participants:** secondary students aged 15 or under
- **Potential contributors to smoking trends:**
 - Factors associated with both smoking and other risk behaviours
 - Substance use attitudes and behaviours

Potential contributors tested



- Family factors: e.g. parental monitoring
- School factors: e.g. intention to complete
- Part time job
- Time spent hanging out with friends (2007 & 12 only)

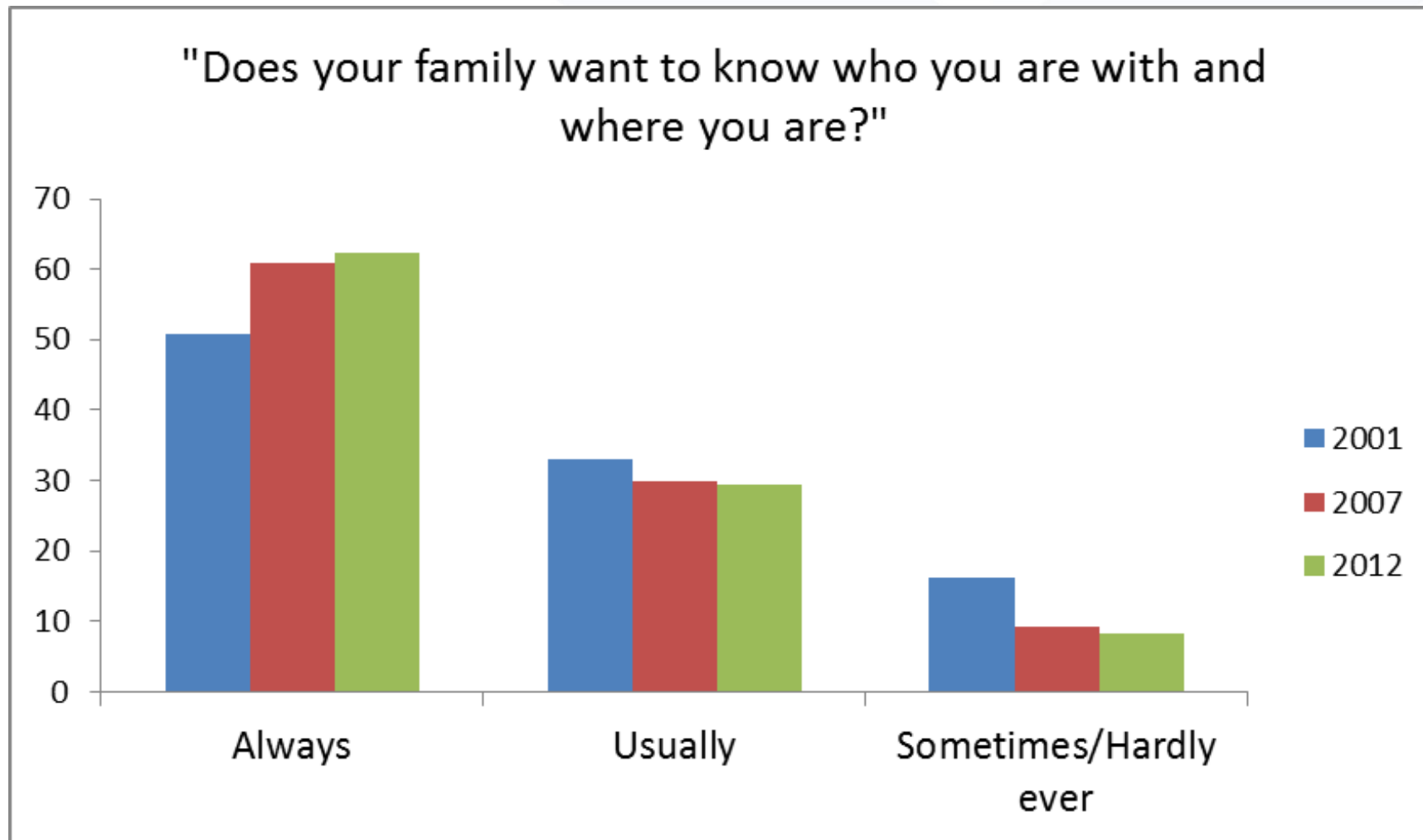
- Parental substance use
- Teen attitudes to smoking, alcohol, marijuana
- Teen behaviour: Past month binge drinking, marijuana use, sexual activity

Approach

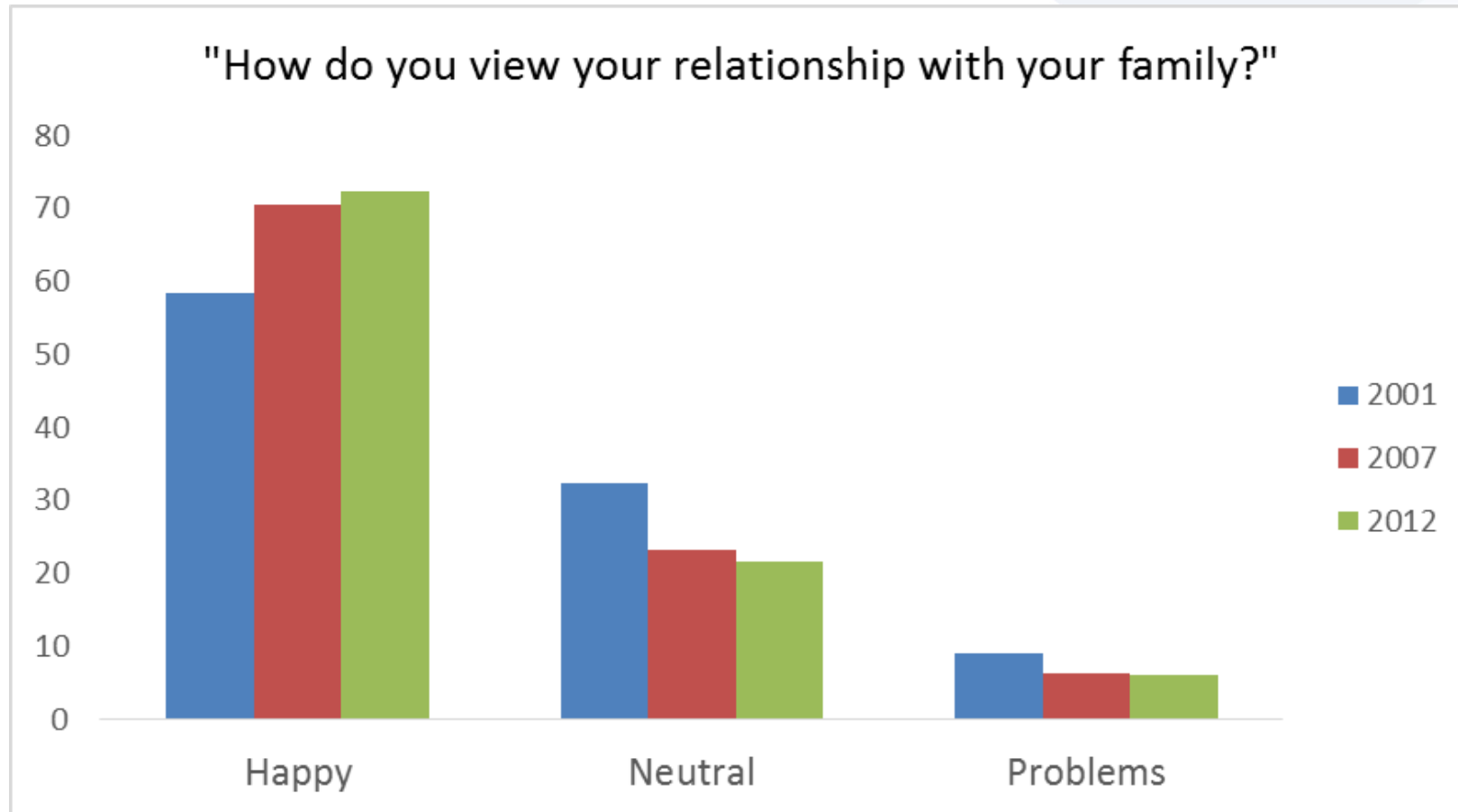


- For each variable:
 - Has prevalence of exposure changed?
 - To what extent does it explain the trend in teen smoking?

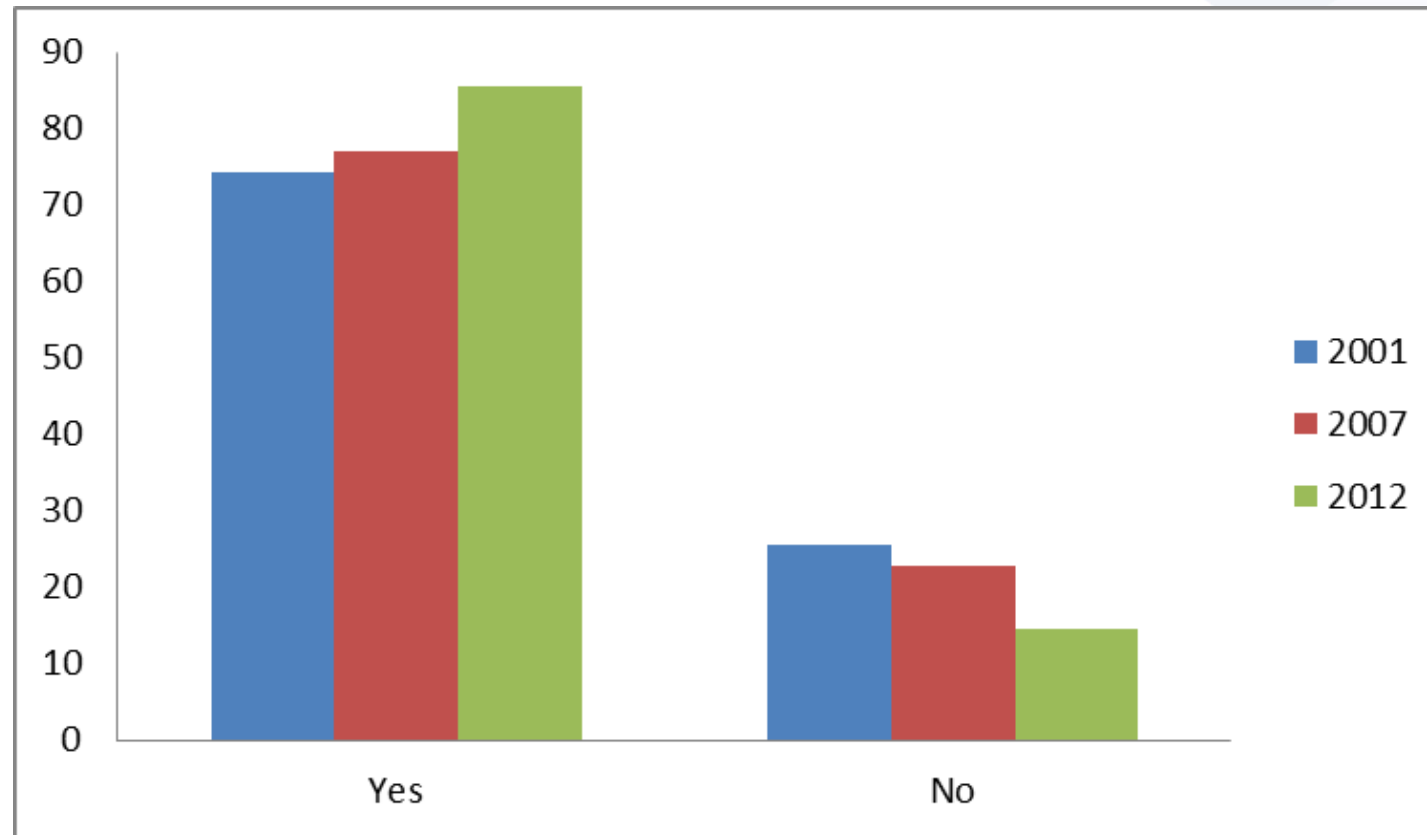
Parental monitoring



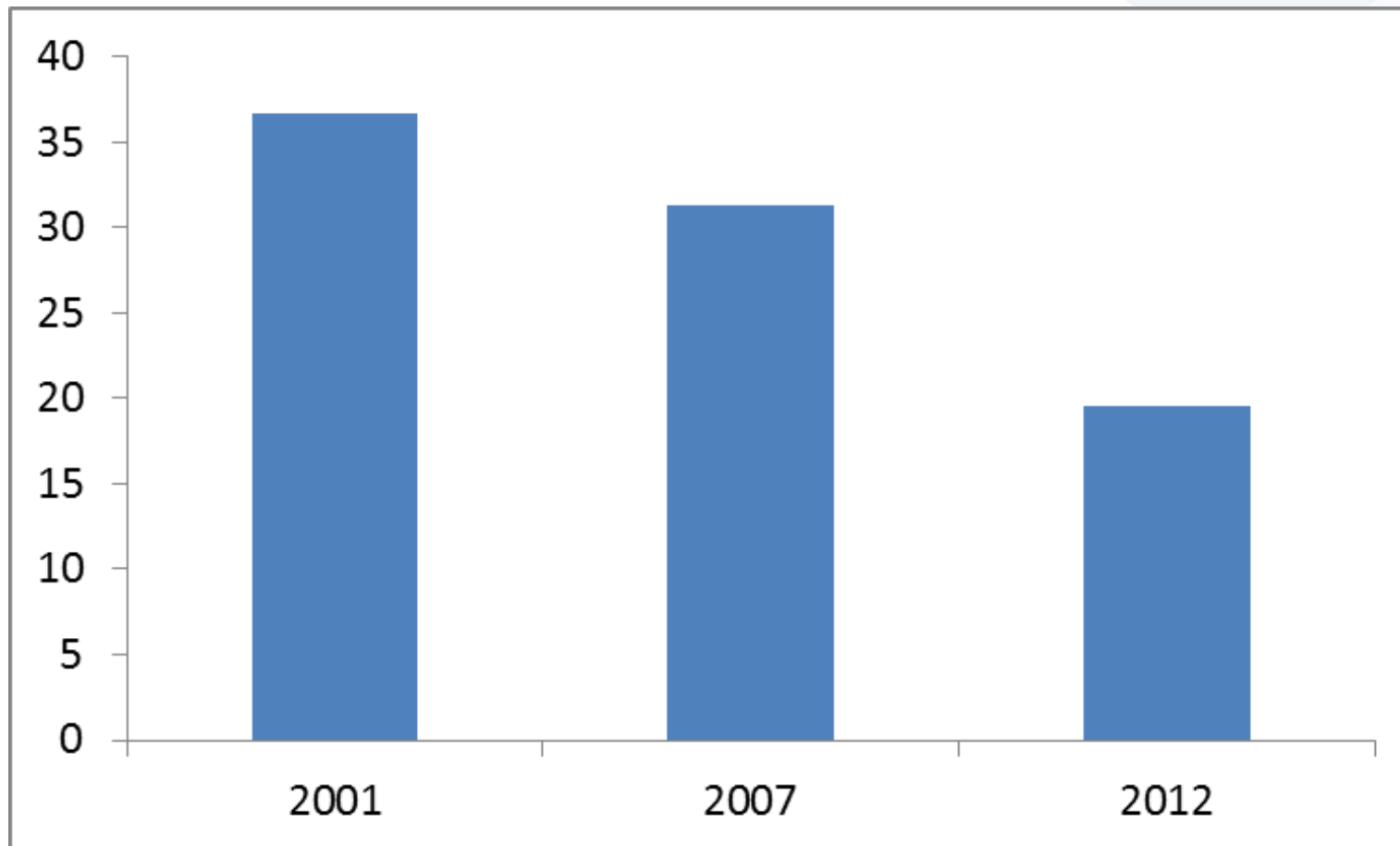
Family relationship



Intention to complete school



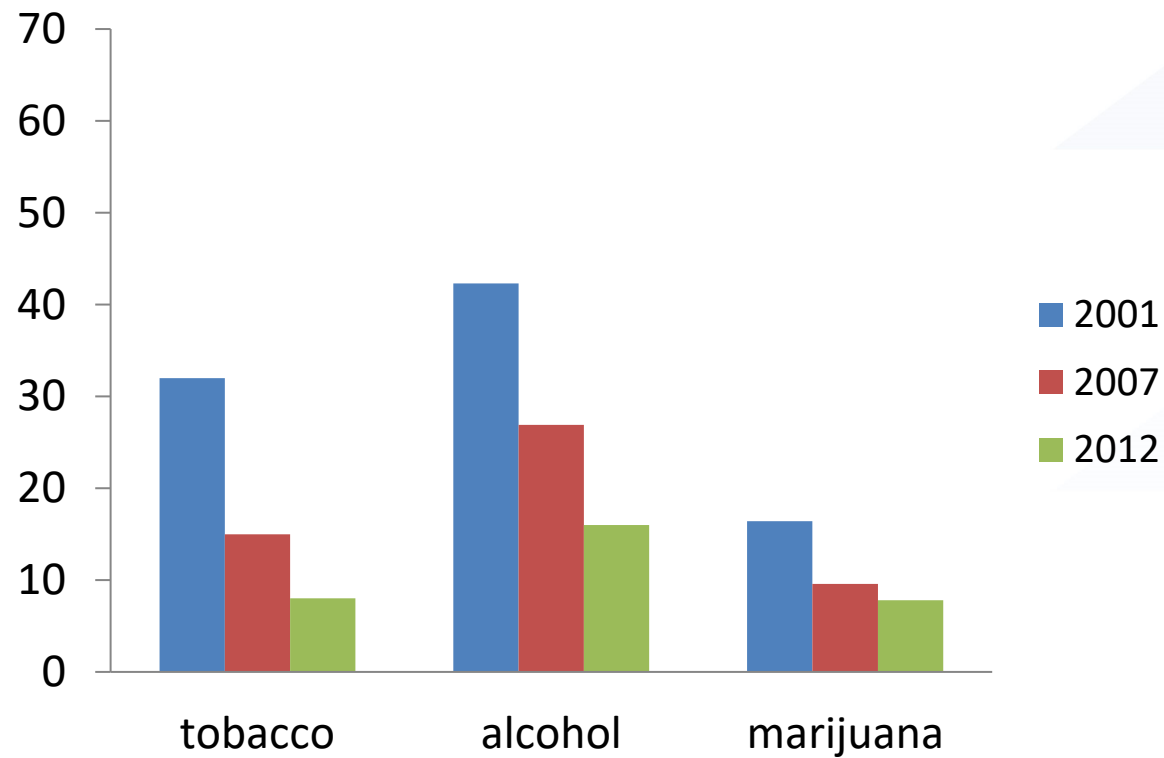
Proportion of students with a part-time job



Attitudes to substance use



“Which of these do you think it is okay for people your age to use regularly?”



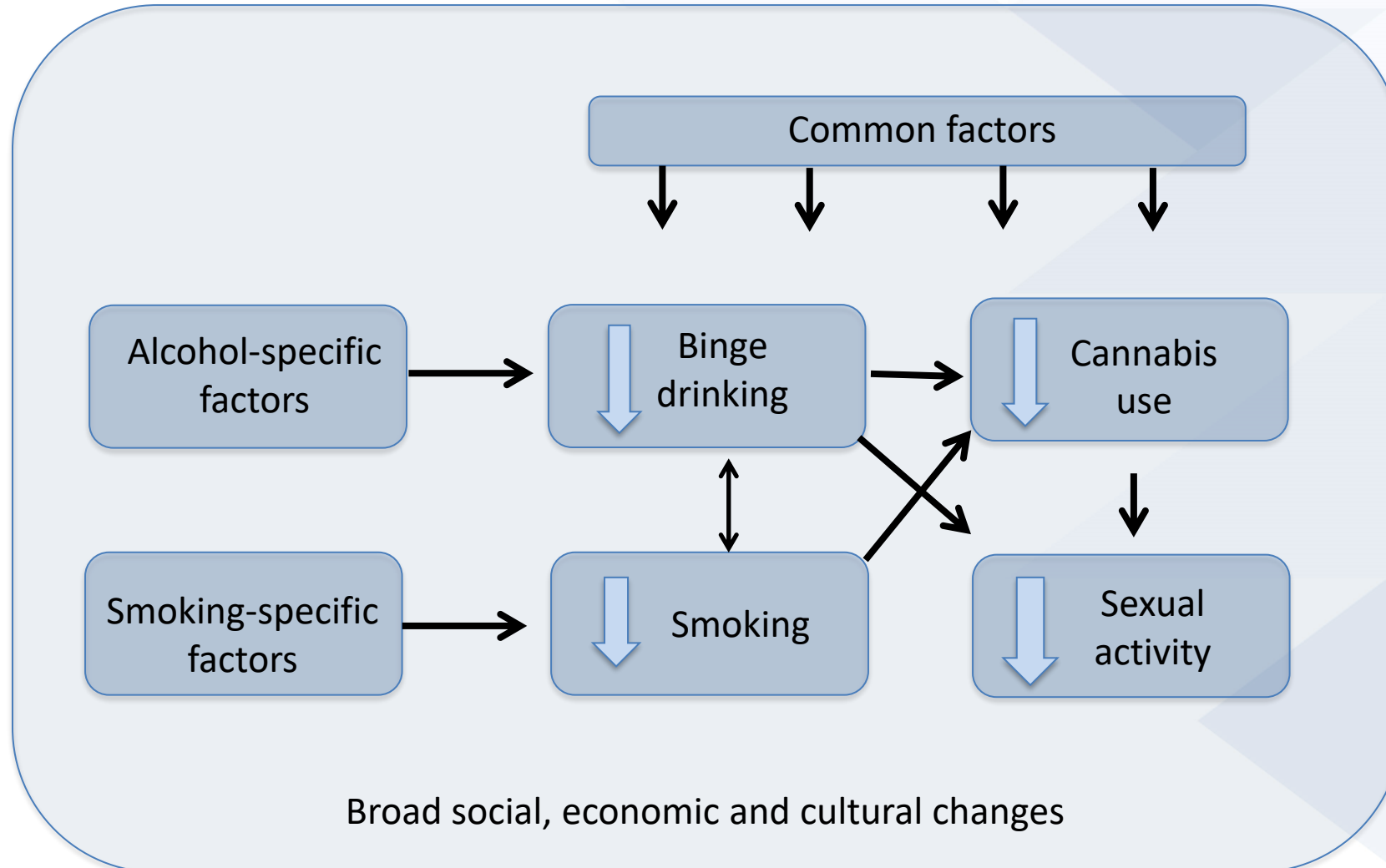
Trend analysis: 2001 - 2012

		OR for year
Model 1	OR 2012 (ref 2001) – adjusted for demographics	0.20
Model 2	2012 (ref 2001) – fully adjusted	0.44
OR for 2012, full model EXCEPT the named variable(s)		
Home/family factors	Parental monitoring	0.44
	Fun with family	0.44
	Family relationship	0.43
	Maternal closeness	0.44
	Paternal closeness	0.44
	Maternal warmth	0.44
	Paternal Warmth	0.45
School/education factors	Students are treated fairly	0.44
	Sense of belonging at school	0.43
	School expects me to do well	0.44
	Intention to complete school	0.42
	Plans after leaving school	0.46
Part time job	Part time job	0.44

Trend analysis 2001-2012 (continued)

		OR for year
	<i>Model 2 fully adjusted</i>	0.44
Student attitudes to substance use	OK to smoke regularly	0.30
	OK to drinking regularly	0.45
	OK to use marijuana regularly	0.44
Parental substance use	Parental smoking	0.44
	Parental alcohol use	0.43
	Parental marijuana	0.44
Other risk behaviours	Past month marijuana & binge drinking combined	0.36
	Past month marijuana use	0.41
	Past month binge drinking	0.40
	Sexually active	0.50

Hypothesised relationship between factors influencing adolescent risk behaviour trends at the population level



Discussion



- Most of the decline in teen smoking remained unexplained
- Biggest contributors (after adjustment):
 - **Attitude change:** Big decline in % of teens who think “It’s OK for people my age to smoke regularly”
 - **Decline in past month binge drinking** and marijuana use



Implications for smoking prevention



- Continued focus on de-normalising tobacco is important
- Alcohol and marijuana trends & policies are likely to impact on teen smoking
- Therefore we need to view alcohol and marijuana as tobacco control issues

Acknowledgements



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- Prof Richard Edwards
- Dr Hera Cook
- Dr Dalice Sim

■ Data owners:

- ASH New Zealand
- Adolescent Health Research Group

Publications



- Ball J, Sim D, Edwards R. (2018) Why has adolescent smoking declined dramatically? Trend analysis using repeat cross-sectional data from New Zealand 2002-2015. *BMJ Open*, 8(10) e020320
- Ball J, Sim D, Edwards R. (2018) Addressing ethnic disparities in adolescent smoking: Is reducing exposure to smoking in the home a key? *Nicotine and Tobacco Research*, 21(4): 430-438.
- Ball J. (2019). *Sex, drugs, smokes and booze: What's driving teen trends? Describing and explaining trends in adolescent sexual behaviour, cannabis use, smoking and alcohol use in the early 21st century*. Doctoral thesis, University of Otago.

BMJ Open Why has adolescent smoking declined dramatically? Trend analysis using repeat cross-sectional data from New Zealand 2002–2015

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ABSTRACT

Objectives Adolescent smoking has declined in New Zealand and in many other countries since the late 1990s, yet the reasons for the decline are not well understood. We investigated the extent to which established risk factors for adolescent smoking (parental, sibling and peer smoking, and exposure to smoking in the home) explained the downward trend.

Design Trend analysis of repeat cross-sectional data from an annual nationally representative survey.

Setting New Zealand.

Participants Secondary school students aged 14–15 (n=398 221).

Outcome measure Regular (at least monthly) smoking.

Methods For each risk factor (parental smoking, best

Strengths and limitations of this study

- The survey has a large sample size (n=20 443–31 833 per year), allowing precise population estimates based on individual-level data.
- Due to data limitations, the study only includes a small number of risk factors, however the risk factors included have consistently been found to be among the strongest and most important predictors of adolescent smoking.
- Our study design (using repeat cross sectional data) does not enable causal inferences to be drawn; rather our study draws on existing knowledge about the predictors of adolescent smoking initiation.



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Original investigation

Addressing Ethnic Disparities in Adolescent Smoking: Is Reducing Exposure to Smoking in the Home a Key?

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Abstract

Introduction: Smoking among New Zealand (NZ) adolescents has declined since 2000, but ethnic disparities remain pronounced. To inform prevention efforts, we investigated exposure to and relative importance of known predictors of adolescent smoking and how these have changed over time, for Māori (NZ's indigenous population) and adolescents overall.

Methods: We used repeat cross-sectional data, 2003–2015, from a national survey of 14- to 15-year olds ($N = 20\,443$ – $31\,696$ per year). For the overall sample and for Māori and non-Māori, we calculated adjusted odds ratios (aORs) to assess the association between regular smoking and risk factors each year: one or more parents smoke, best friend smokes, older sibling(s) smoke, and past week exposure to smoking in the home. We calculated population attributable risk (PAR) for risk

