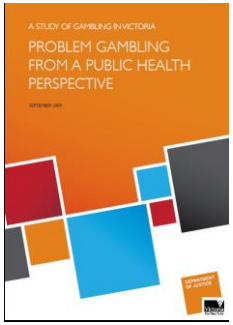

The Victorian Gambling Study Identifying and predicting risks

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15th International Conference on Gambling and Risk Taking, Las Vegas,
May 2013

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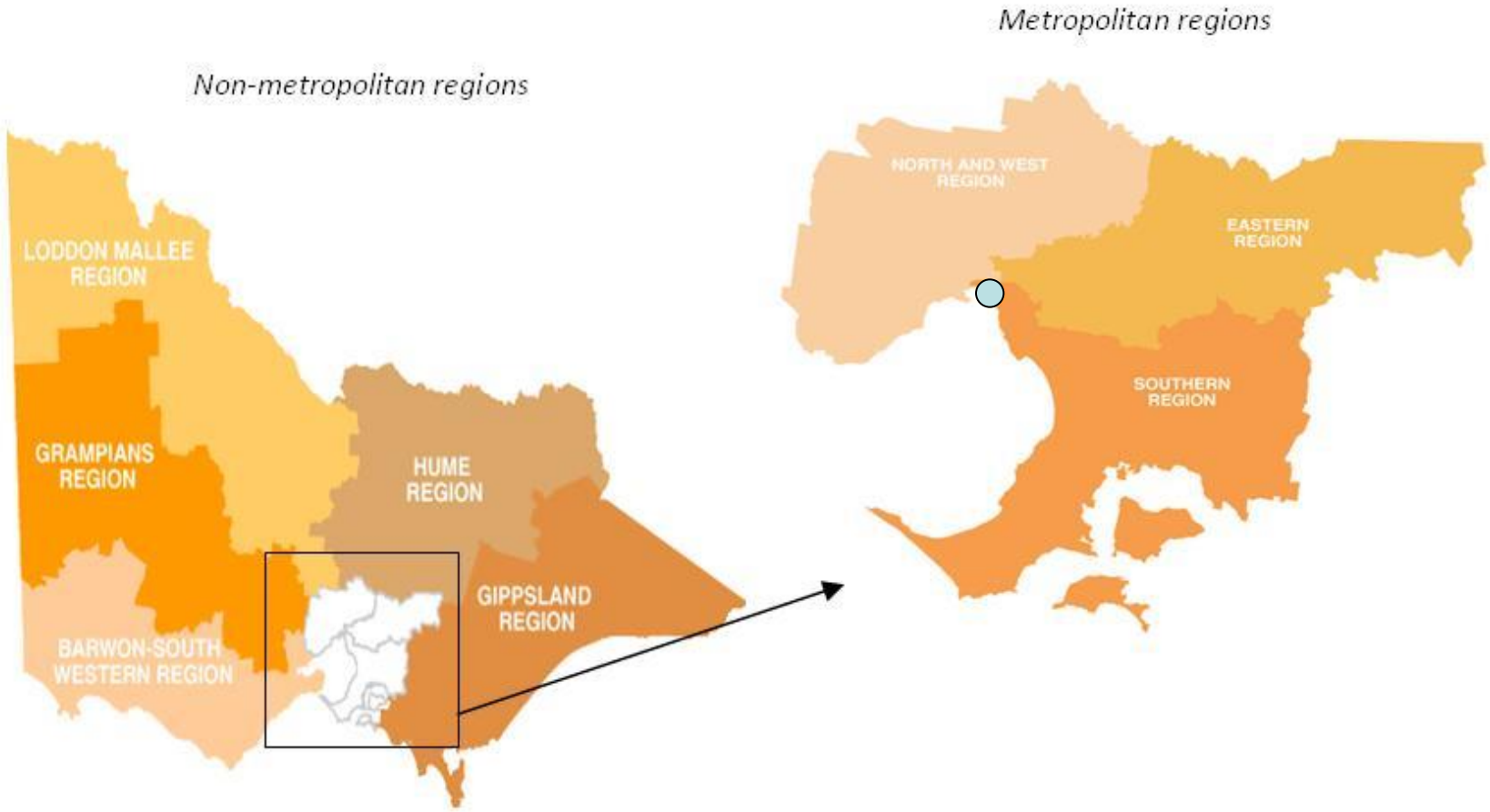
Victorian Responsible Gambling Foundation
14-20 Blackwood Street,
North Melbourne

Free City Circle Tram in front of Parliament House, Melbourne

The home of Australian Rules Football

*Photo by Madam3181 at FlickR

Map of *Victorian Government Regional Boundaries*



Source: Department of Health, Victoria website viewed 25 March 2011

Overview

Background
Study design

- Incidence
- Transitions
- Risk & protective
- Co morbidities

The Victorian Gambling Study

Objectives

To explore:

- Risks and vulnerabilities related to changes in gambling status
- Incidence
- Movements in and out of PGSI states

Eleven Hypotheses

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Sample

- W1 representative sample enriched for problem gamblers
- RDD
- W2-W4 longitudinal follow up of W1
- CATI
- Analysis

Design

- W1 population estimates derived from sample weighted (selection probability at household, area and population level
- W2- quasi representative (so weighted for incidence)
- W2- W4 unweighted

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Gambling Participation questions

- Gambling participation in 12 activities:
  - informal private betting; electronic gaming machines (EGMs); table games (eg., blackjack, roulette, poker); horse or harness racing or greyhounds; sports and event results; Lotto, Powerball or the Pools; Keno; scratch tickets; bingo; telephone or SMS competitions; raffles, sweeps and other competitions; and speculative stock investments.

- Gambling behaviour using the Problem Gambling Screening Index (PGSI)
  - Nine-item index with scores from 0 to 27
  - Non-gambler, non-problem gambler (PGSI=0), low-risk gambler (PGSI=1-2), moderate-risk gambler (PGSI=3-7), problem gambler (PGSI=8-27)

- Lifetime risk of gambling using NORC DSM-IV Screen for Gambling Problems – Control, Lying and Preoccupation (NODS-CLiP2) scale
  - Lifetime non-problem gambler (NODS=0); lifetime at-risk gambler (NODS=1,2); lifetime problem gambler (NODS=3-4); lifetime pathological gambler (NODS≥5)

Health and Wellbeing Questions

Core non- gambling questions in W1, W2, W3, W4

- **health, K10, readiness to change, life events, recreation, smoking, CAGE etc**

Additional contextual questions for specific waves

- **Global Financial Crisis (W2)**
- **Economic Stimulus Package (W2)**
- **Vic bushfires (W2)**
- **Linked jackpots (W3)**
- **Major sporting events (W3)**
- **Additional social capital (W4)**
- **Trauma and Hardship (W1 and W4)**
- **Loneliness (W4)**

Data Collection Periods

Wave One	July 2008 - October 2008
Wave Two	September 2009 - January 2010
Wave Three	September 2010 - January 2011
Qualitative	May 2011 - August 2011
Wave Four	October 2011 - January 2012

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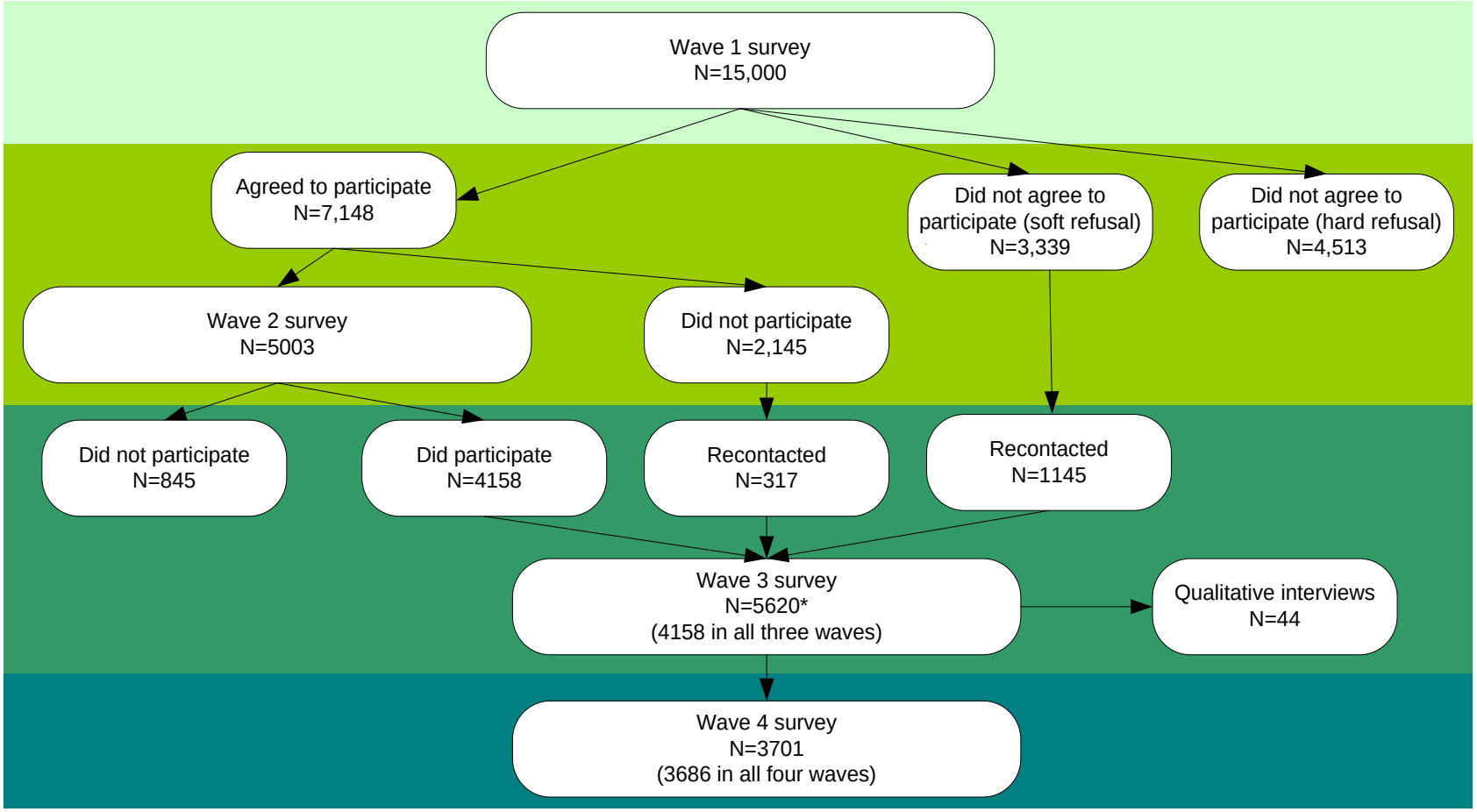
Survey cohort Overview



* Includes only valid responses

Attrition

Major source of bias in prospective studies

- No universal acceptable attrition rate
- Loss of 30-40% raises study validity
- Even smaller rate loss difficult to interpret if due to exposure, outcome or both

Attrition rates

- W1-W2 30%
- W2-W3 17%
- W1-W3 21%
- W3-W4 11%
- W1-W4 48%

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Results-Adult population

- 2.98m Victorians gambled in Wave One. This represents 73.1% of the population.
- 1 in 5, 1 in 4 and 1 in 8 participated in 1, 2 or 3 gambling activities

Gambling Activity	Participation Rate (%)	Estimated Population
Lotto, Powerball, the Pools	47.5	1,416,322
Raffles or sweeps	42.9	1,279,163
Electronic gaming machines	21.5	641,072
Wagering	16.4	489,003
Scratch tickets	15.3	456,204

Prevalence %

	Prevalence	Estimated Population 2008
Gambling Behaviour (PGSI)		
Non-gambler	26.9	802,085
Non-problem gambler	64.3	1,917,253
Low-risk gambler	5.7	169,958
Moderate-risk gambler	2.4	71,561
Problem gambler	0.7	20,872
Lifetime Gambling Risk (NODS)		
Non-problem gambler	93.1	2,775,991
At-risk gambler	4.6	137,159
Problem gambler	1.2	35,780
Pathological gambler	1.1	32,799

Incidence*

12 month incidence rate

- **0.36%** (95% CI 0.21% - 0.57%)
- Vic prevalence rate from wave one - **0.7%**

Lifetime Incidence- NODS CLiP2

- **0.12%** (CI – 0.03% - 0.25%) - (of 0.36%) new problem gamblers
- **0.24%** (CI 0.13% - 0.41%) - (of 0.36%) previous history of path/problem gambling ('relapse')

*Incidence estimates weighted

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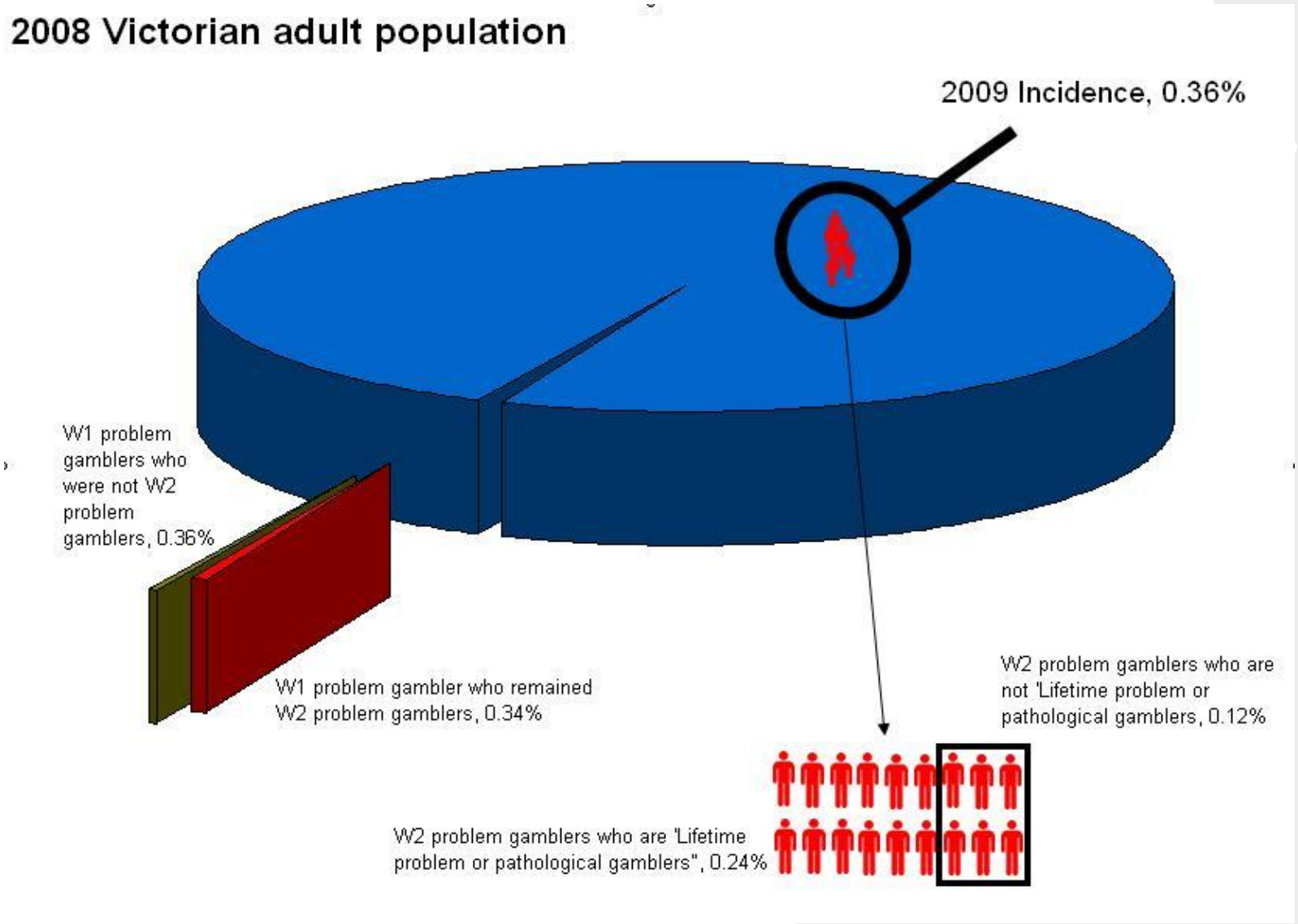
Incidence


2008 Victorian adult population
2009 Incidence, 0.36%
W1 problem gamblers who were not W2 problem gamblers, 0.36%
W1 problem gambler who remained W2 problem gamblers, 0.34%
W2 problem gamblers who are not 'Lifetime problem or pathological gamblers, 0.12%
W2 problem gamblers who are 'Lifetime problem or pathological gamblers", 0.24%

Transitions-stability

Most stable groups (least proportion of gamblers moving in and out of PGSI categories)

W1-W2 (total sample 5003)
Problem gamblers 72.5%
Non problem gamblers 87.8%

W1-W3 (total sample 5620)
problem gamblers 64.29%
non problem gamblers 85.85%

W2-W3 (total sample 4158)
Problem gamblers 69.44%
Non problem gamblers 86.4%

W1-W4 (total sample 3701)
problem gamblers 48.4%
non-problem gamblers 72.5%

Transitions- stability

W1, W2 and W3

- 56% of problem gamblers were classified as problem gamblers in all three waves
- 83% of problem gamblers in wave one were classified as either MR or PG in W2 and W3

W1 and W3 (n=5620)

- 64% problem gamblers remained problem gamblers

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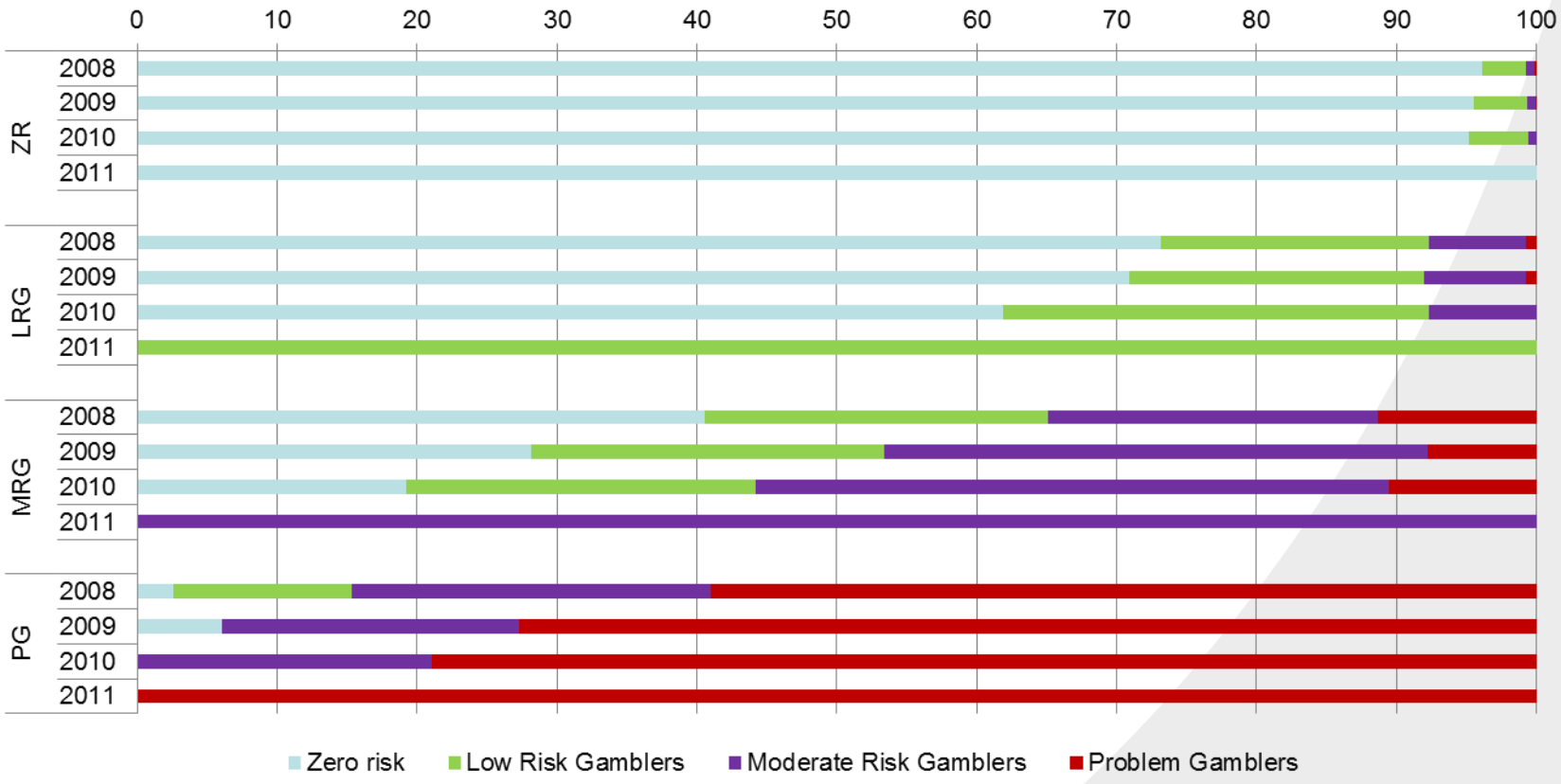
		Wave 1 (2008)					
		NG	NPG	LR	MR	PG	**Total**
Wave 2 (2009)	NG	464	240	9	3	0	**716**
	NPG	526	3131	144	20	2	**3823**
	LR	24	169	81	26	0	**300**
	MR	9	24	38	39	9	**119**
	PG	1	5	2	8	29	**45**
	Total	**1024**	**3569**	**274**	**96**	**40**	**5003**
Wave 3 (2010)	NG	483	282	15	3	3	**786**
	NPG	624	3453	145	18	1	**4241**
	LR	40	239	91	31	3	**404**
	MR	4	44	39	44	8	**139**
	PG	0	4	6	13	27	**50**
	Total	**1151**	**4022**	**296**	**109**	**42**	**5620**
Wave 4 (2011)	NG	283	174	8	2	4	**471**
	NPG	402	2309	95	17	1	**2824**
	LR	16	175	50	18	2	**261**
	MR	8	35	26	25	12	**106**
	PG	0	1	5	10	23	**39**
	Total	**709**	**2694**	**184**	**72**	**42**	**3701**

PGSI Risk Group Transitions

Wave Four risk groups from Waves One, Two and Three

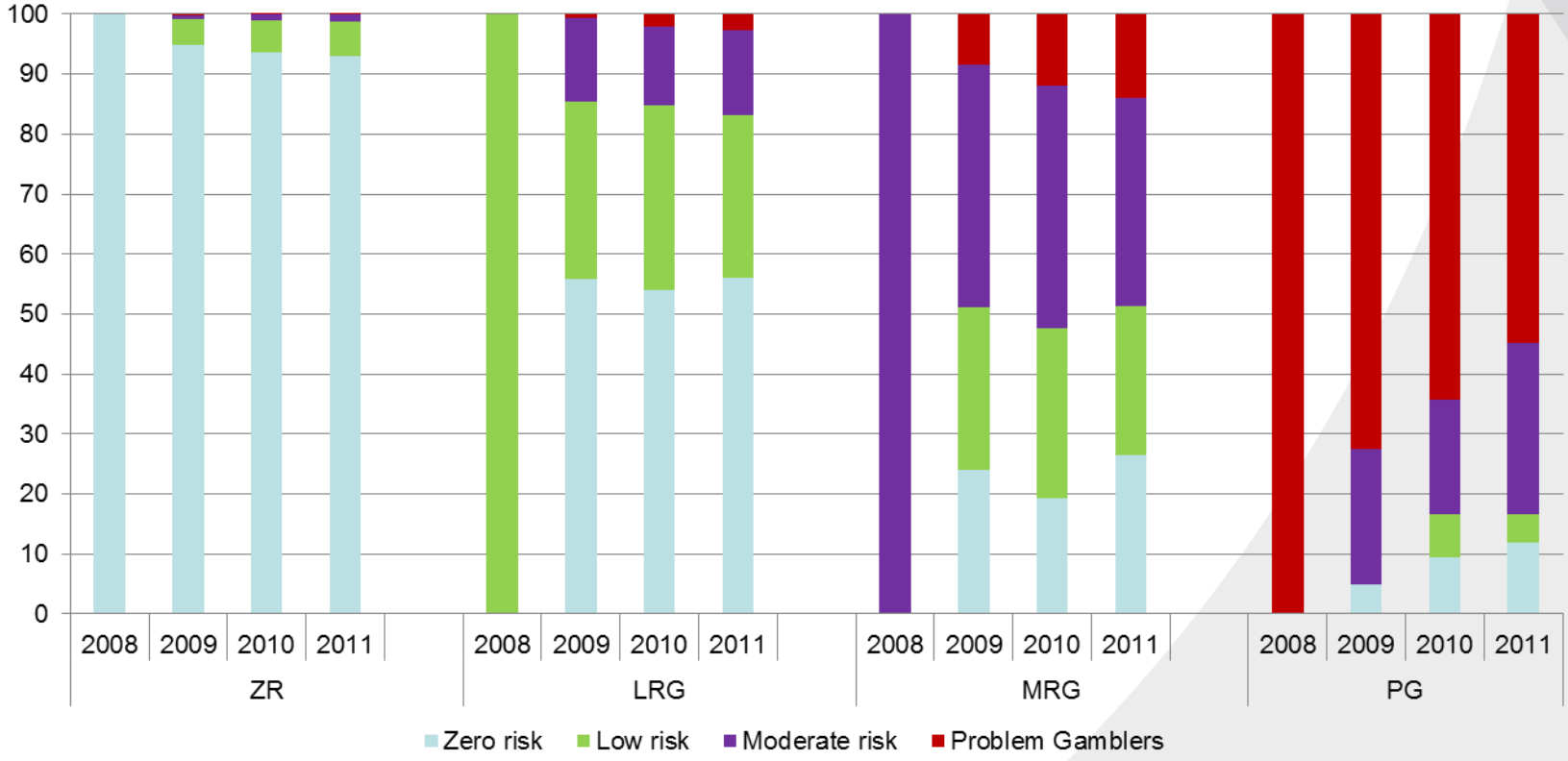
eg problem gamblers and their risk group in previous waves



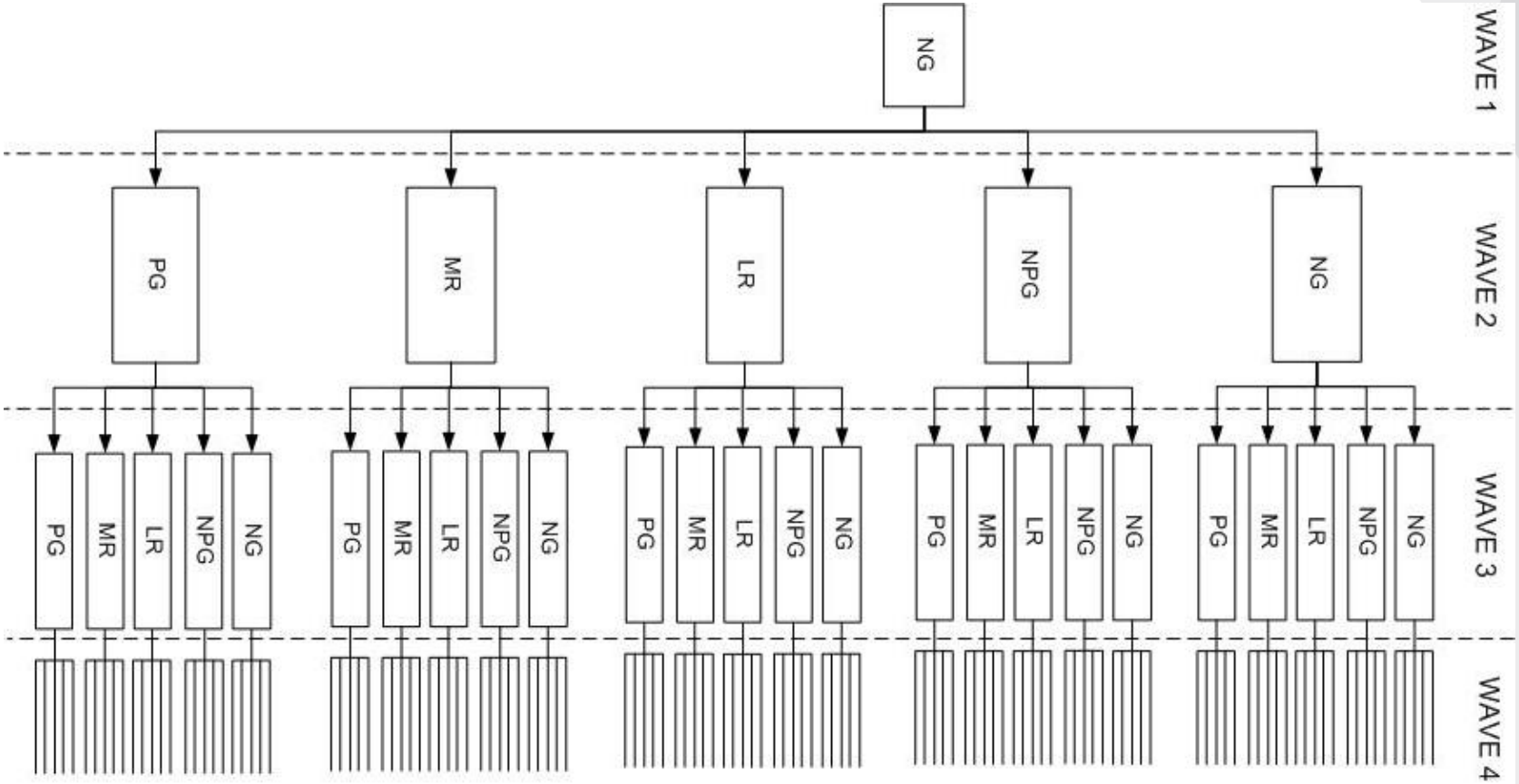
PGSI Risk Group Transitions

Wave One risk groups thro Waves Two, Three and Four

eg problem gamblers and their risk group in subsequent waves



Markov models



Predictive probability W1 - W3

- 87.35% of NPG were likely to remain NPG year to year
- MR over three years have greatest probability of moving to PG
- 71.4% PG in Wave One are likely to remain as PG in Wave Three
- Over half (56.6%) of LR gamblers are predicted to move to NPG category over the three year period

Associations – risk factors W1 – W2 PG

Strongest **associations** are:

- people who took up/played gaming machines
- Playing keno.

Other factors shown to be important are:

- poor general & psych health
- those from one-parent families
- people who have had a major illness or injury in past year
- new marriage or other relationship partner

Risk and Protective Factors 1

	PGSI category			Number (%)
	Wave One	Wave Two	Wave Three	
Risky	NPG	≥NPG	>NPG	202 (7.8)
Non risky	NPG	NPG	NPG	2388 (92.2)

Risk and Protective Factors 2

Risk factors included

- Language other than English (OR 0.33)
- Year 10 or less (OR 0.14)
- Signs of alcohol dependence (OR 0.35)
- NODS at risk category (OR 0.13)
- Anxiety (OR 0.40)
- Obesity (OR 0.33)

Risk and Protective Factors 3

- Protective Factors

- Only one factor was found to be protective of developing an increased risk

  – Being female (OR 1.83)

Sample of Wave Four Analysis

- Cells were too small for extensive predictive probability analysis
- Transitions analysis
- PGSI item analysis using longitudinal data (i.e. across all waves)
- NODS CLiP2 analysis
- Currie et al 2012 JGS replication (i.e. comparison of NPG, LR, MR & PG on demographic variables using PGSI scoring, comparison of NPG, LR, MR & PG on mental health indicators)
- Wave Four only (3701) - social capital, loneliness, trauma

Co morbid disorders

- A disease or condition that co-exists with problem gambling in an individual
- Problem gamblers are more likely to:
  - Smoke
  - Abuse alcohol
  - Have poor psychological health
  - Have poor physical health

Co morbid disorders– Chicken or egg ?

Incident
High-risk
Gambling
Behaviour

Incident
Health
Condition

Identifying risks – co morbid disorders

- Previous studies of co-morbidities
  - Cross-sectional studies of jurisdictional prevalence
  - Small clinical samples
  - Strong correlation between high-risk gambling behaviour and mood disorders
    - DSM IV Axis III conditions cannot be discerned

- We estimated both the direction and strength of the relationship between incident high-risk gambling behaviour and incident chronic disease in a population based cohort of adult Victorians.
  - First and biggest study of its kind internationally

Q1 Co morbid disorders➔ Gambling

Cases

- MRPG at W2 or W3, but not both
- <MRPG in all prior waves

- *Controls*
  - matched for sex within five years of cases
  - Sampled randomly from NPG, LR, MRPG-at the same wave as the case
  - Each case has 12 controls
  - Controls not omitted on basis of their development of MRPG status in future (feature of nested case control)

- *Exposure variables*
  - life events, triggers, alcohol dependence, self reported health, psychological distress

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Q1 Co morbidities➔ Gambling

- Scoring as an ‘at-risk lifetime gambler’ (NODS CLiP2) was significantly associated with new onset of high risk gambling behaviour during the study period (OR=6.3, p=0.007, CI 1.7-23.9).
- Any health condition (OR=2.7, p=0.027, CI 1.1-6.7)
- Current smoker (OR=2.7, p=0.035, CI 1.1-6.8)

Further analysis on any health condition…

- Participants with anxiety were x 4 more likely to develop MRPG (OR=4.0 p=0.036, CI 1.1-14.6) [adjusted for NODS and smoking]

(caution: self reported health)

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Q 2 Gambling →Co morbidities

Cases =diabetes, cvd, obesity, lung conditions, depression, anxiety etc (n=128) in W2

Controls - free of all of above in all waves (n=564)

The significant variables were:

- being male (OR=2.0, CI 1.3-3.0, p=0.002),
- age (OR= 1.02, CI 1.00-1.03, p=0.008),
- disability (OR=2.1, CI 1.9-4.0, p=0.028)
- PGSI problem gambling risk category (OR=4.2, CI 0.9-18.9, p= 0.061).

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Acknowledgements

- Max Abbott
- Sarah Hare
- Damien Jolley
- Penny Marshall
- Jan McMillen
- Elmer Villanueva
- Rachel Volberg
- Rosa Billi
- Paul Marden
- Christine Stone

We would like to acknowledge and remember Damien Jolley

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Strengths & limitations

- Temporal sequence- causation
- Incidence estimate
- Self reported health
- Landline

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