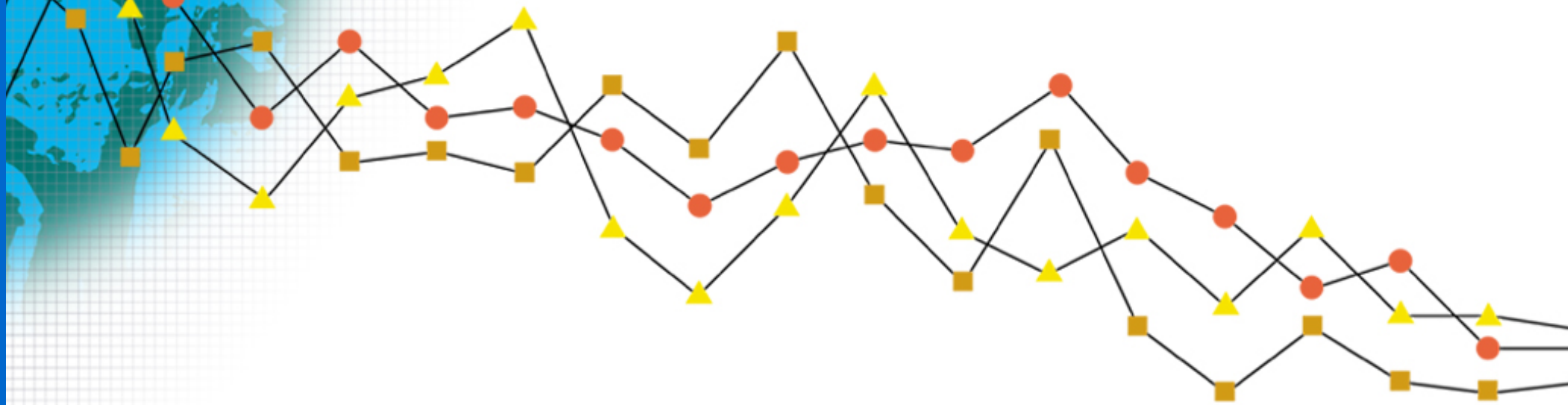
An Overview of Causes of Cancer in New Zealand



Ms Naomi Brewer, Dr Mona Jeffreys, Professor Neil Pearce
Centre for Public Health Research
Massey University
Wellington

Massey University

Background

- Population attributable fractions (PAFs) for cancer
  - mortality: estimated for some exposures
  - incidence: not previously estimated
- Importance of occupation
  - frequently ignored
- PAFs depend on exposure prevalence
  - estimated using NZ data

Massey University

Methodology

- Exposures chosen based on Harvard review (2000)
- Relative risks associated with exposures identified
  - International literature
  - Meta-analyses or reviews
  - Large observational studies
- Estimated attributable fraction and cases
  - Based on number of cancer cases in 2000
  - Cancer Registry data

Massey University

Calculation

- PAF formula: $PAF = p(RR-1) / p(RR-1)+1$
  p = proportion exposed in the population
  RR = relative risk
- Smoking & lung cancer:
  - p = 22.9% RR = 20.9
  - PAF = 0.229(20.9-1) / 0.229(20.9-1)+1 = 0.82 (82%)
  - Lung cancer registrations = 1,599
  - 0.82 x 1,599 = 1,311 attributable cases

Calculations for multiple exposures: Asbestos workers who smoke

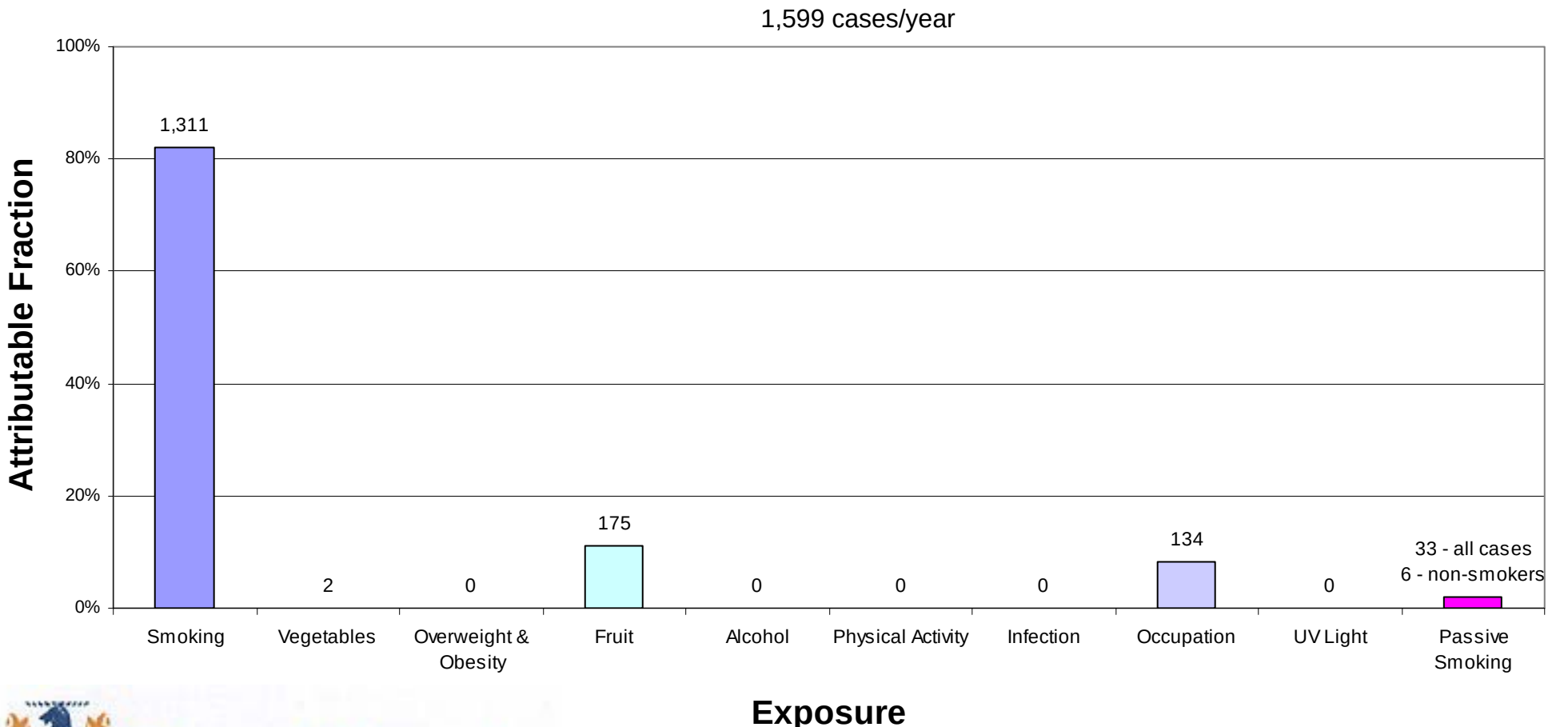
- Smoking:
  - p = 100% RR = 20.9
  - PAF = 1(20.9-1) / 1(20.9-1)+1 = 0.95 (95%)
- Asbestos:
  - p = 100% RR = 5.0
  - PAF = 1(5.0-1) / 1(5.0-1)+1 = 0.80 (80%)
- Some cancers occur because of the combination of exposures:
  - 1% would have occurred anyway
  - 4% are just due to asbestos
  - 20% are just due to smoking
  - 75% are due to the combination of asbestos and smoking

Limitations

- Investigated exposures have overlapping effects on the aetiology of cancer
  - individual PAFs can add to more than 100%
- Risk data is not always consistent with exposure data
- Gender and ethnic-specific analyses would show different patterns
  - same relative risks
  - differences in exposure levels

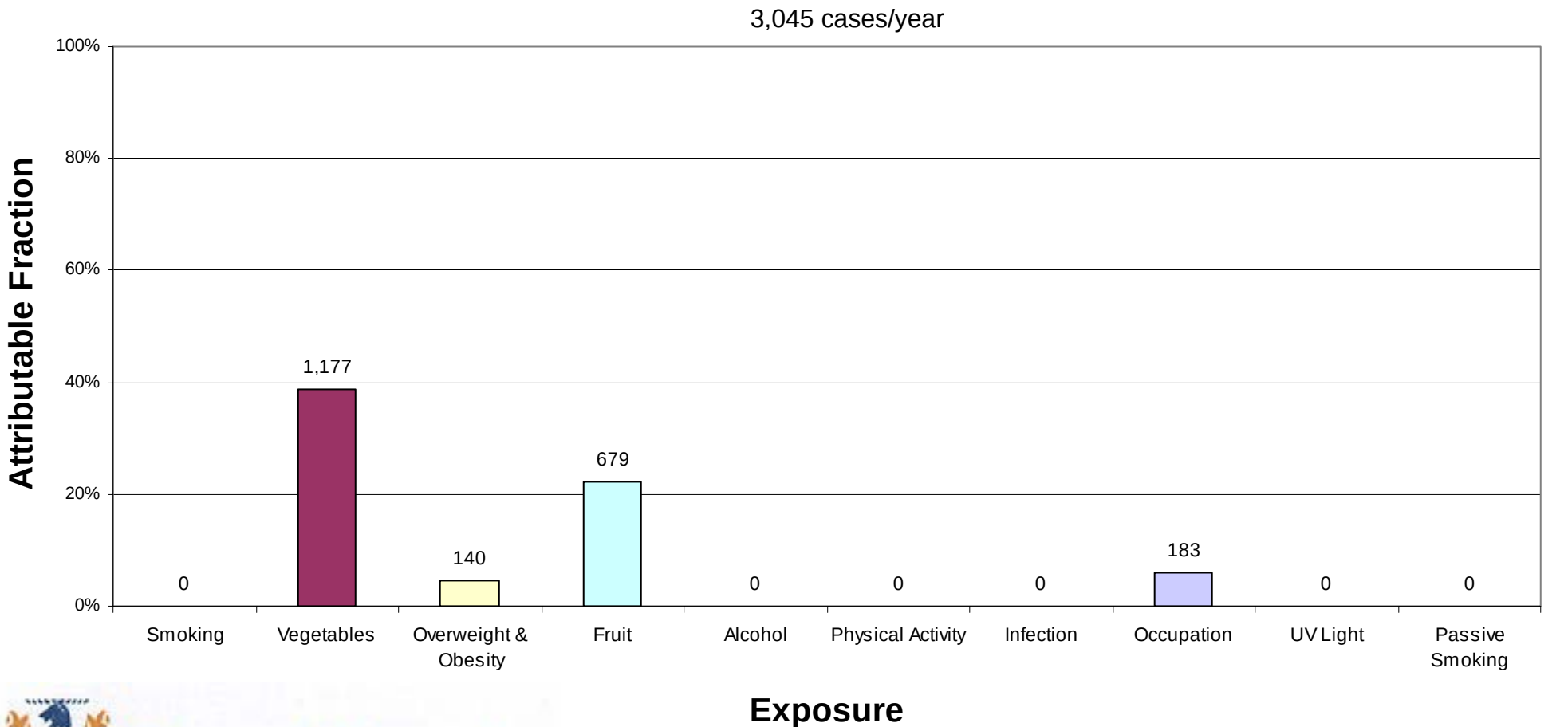
Massey University

Lung Cancer



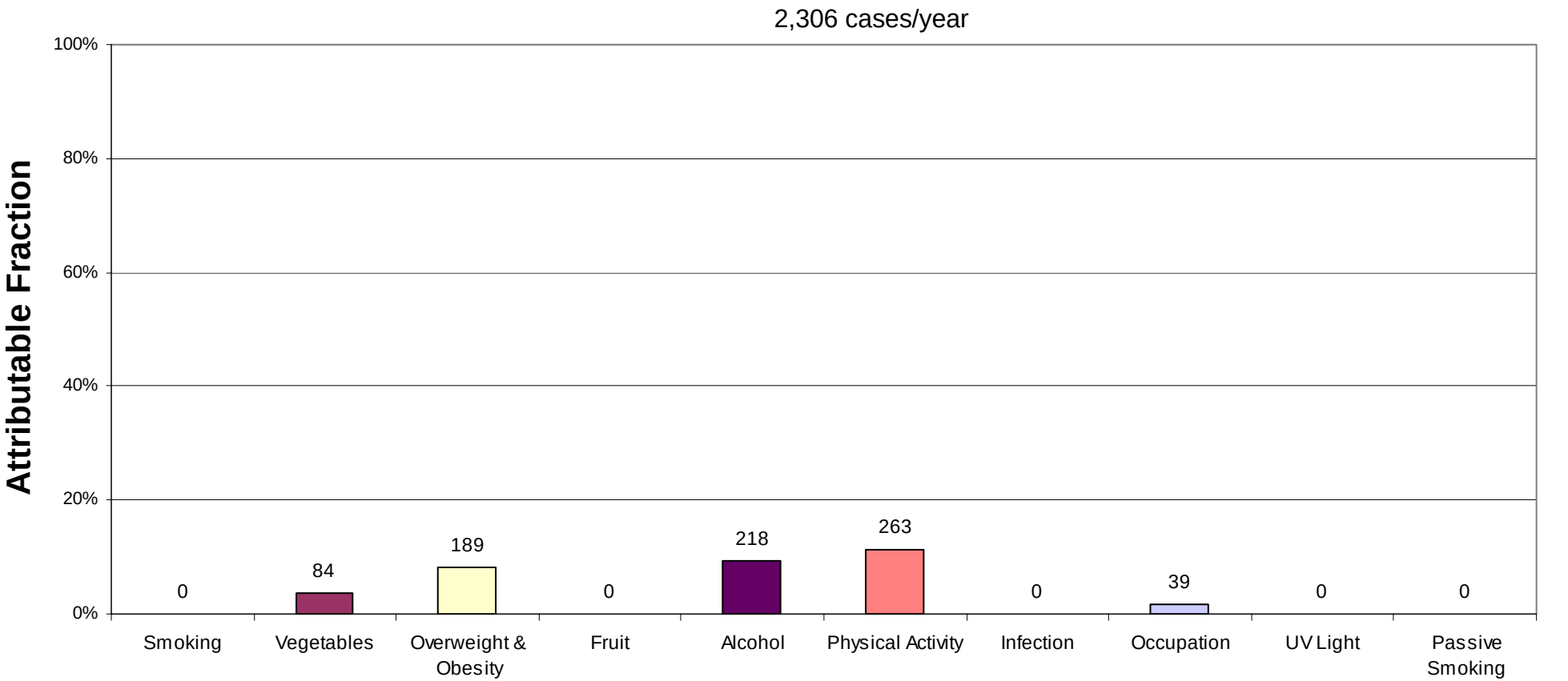
Massey University

Prostate Cancer



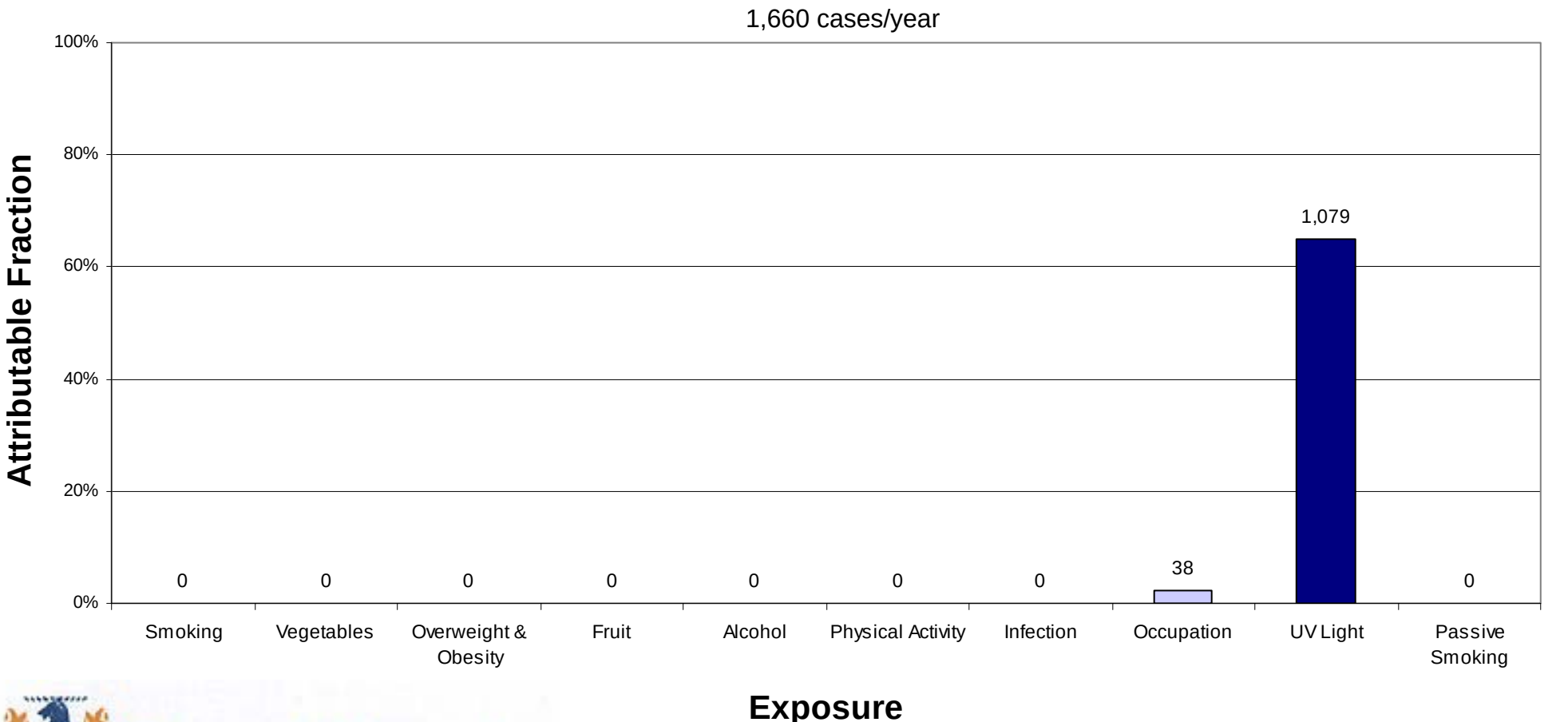
Massey University

Female Breast Cancer



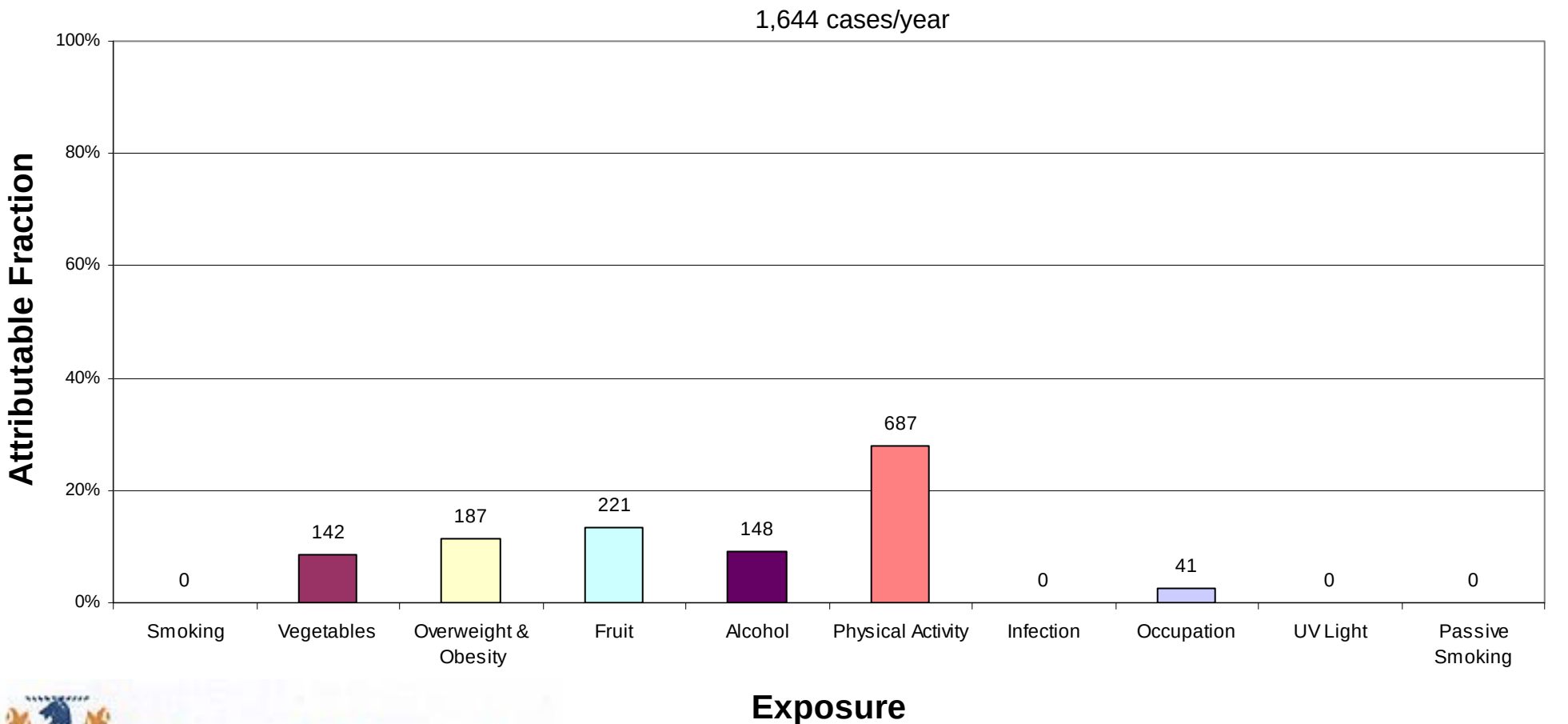
Massey University

Melanoma of Skin



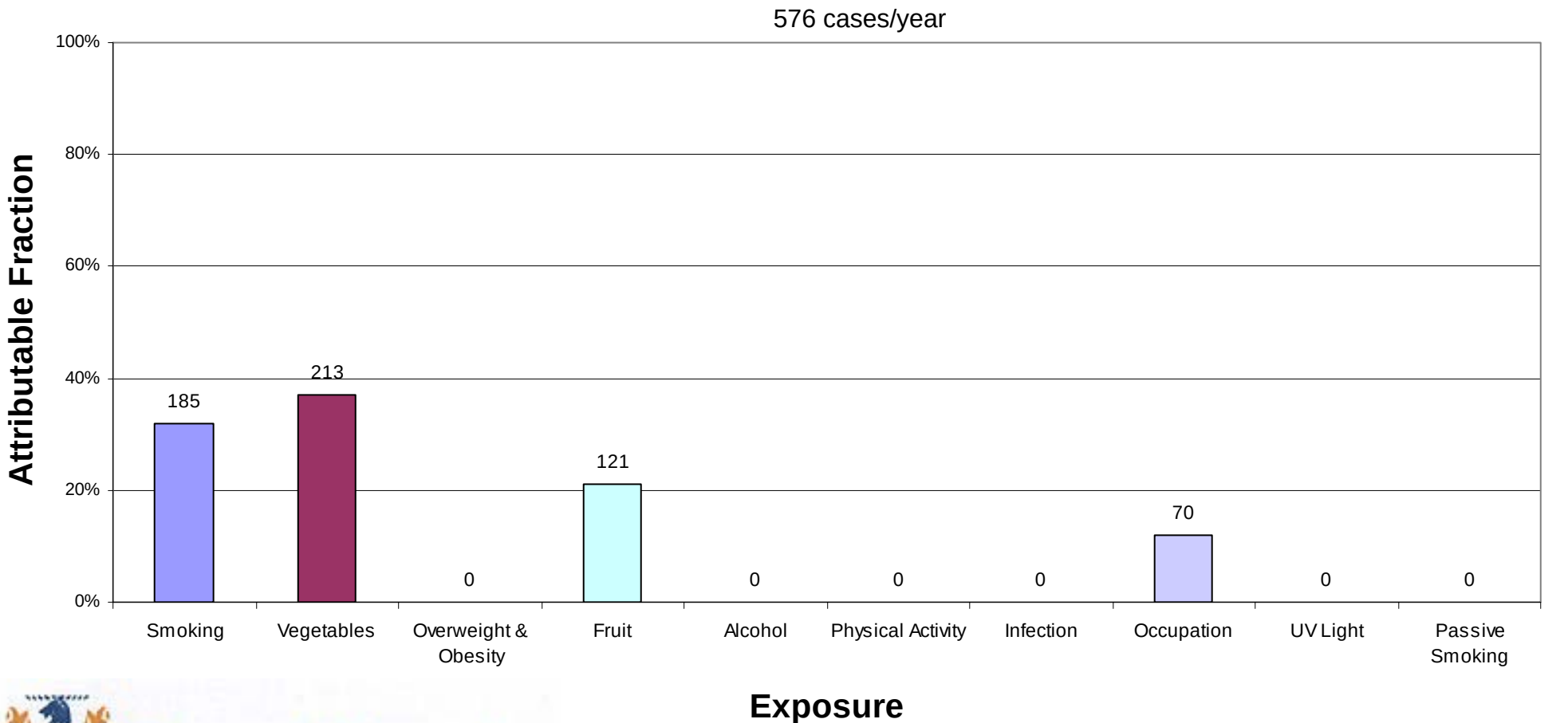
Massey University

Colon Cancer



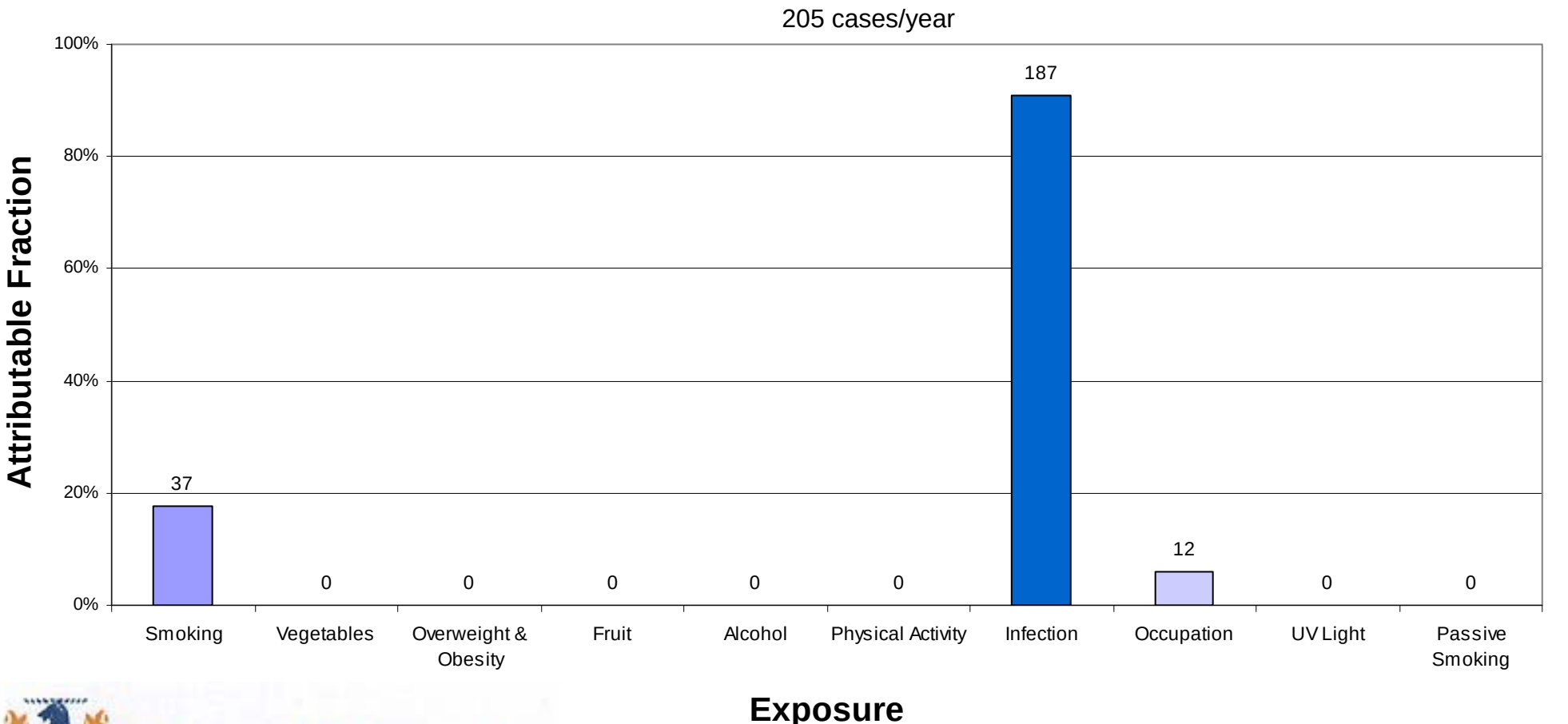
Massey University

Bladder Cancer



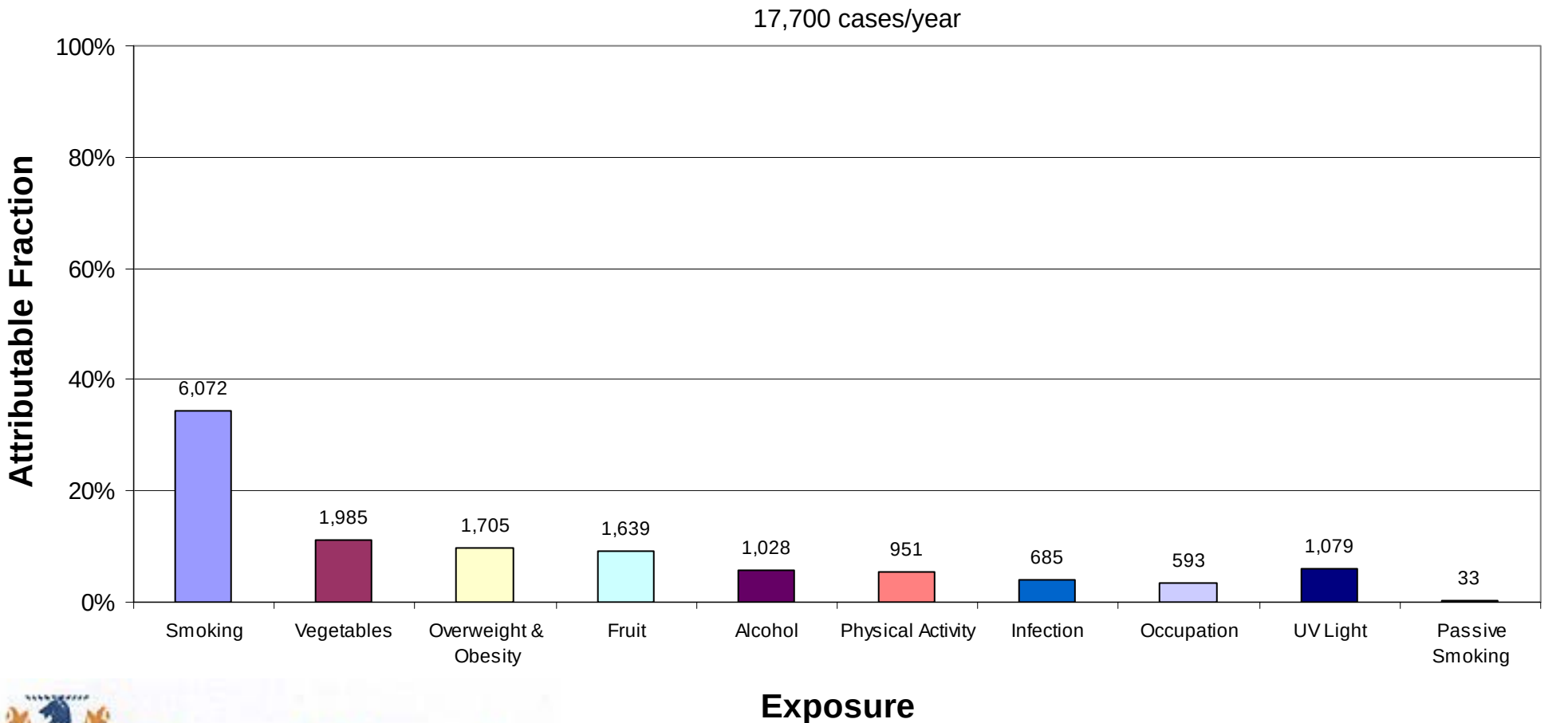
Massey University

Cervical Cancer



Massey University

All Cancers



Massey University

Summary

	Attributable cases	PAF
Smoking	6,072	34%
Vegetables	1,985	11%
Overweight & Obesity	1,705	10%
Fruits	1,639	9%
Alcohol	1,028	6%
Physical Activity	951	5%
Infection	685	4%
Occupation	593	3%
UV Light	1,079	6%
Passive Smoking	33	0.2%

Massey University

Conclusions

- Great potential to prevent many cases of cancer
- Political will to implement current policies must remain
- Policies with a specific focus on cancer for occupation and alcohol exposure are required
- Effective interventions must continue to be sought
- Exposure data in New Zealand could be collected in a manner that is consistent with the international literature

Massey University