Melanoma overdiagnosis in Australia

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PREVENTING OVERDIAGNOSIS
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preventingoverdiagnosis.net

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Cancer Overdiagnosis

When an individual is diagnosed with cancer but he or she would never have suffered symptoms or harm from that cancer had it been left undetected and untreated

(Brodersen et al. BMJ Evid Based Med 2018; Welch & Black. J Natl Cancer Inst 2010).

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Cancer Overdiagnosis

- Recognised problem in screen detected cancer:

~20-50% of prostate cancer (Draisma et al. JNCI 2003)

~20% of breast cancer (Marmot et al. BJC 2013)

- Also problem with incidentally detected cancer: thyroid cancer 'epidemic' in South Korea

- Melanoma?

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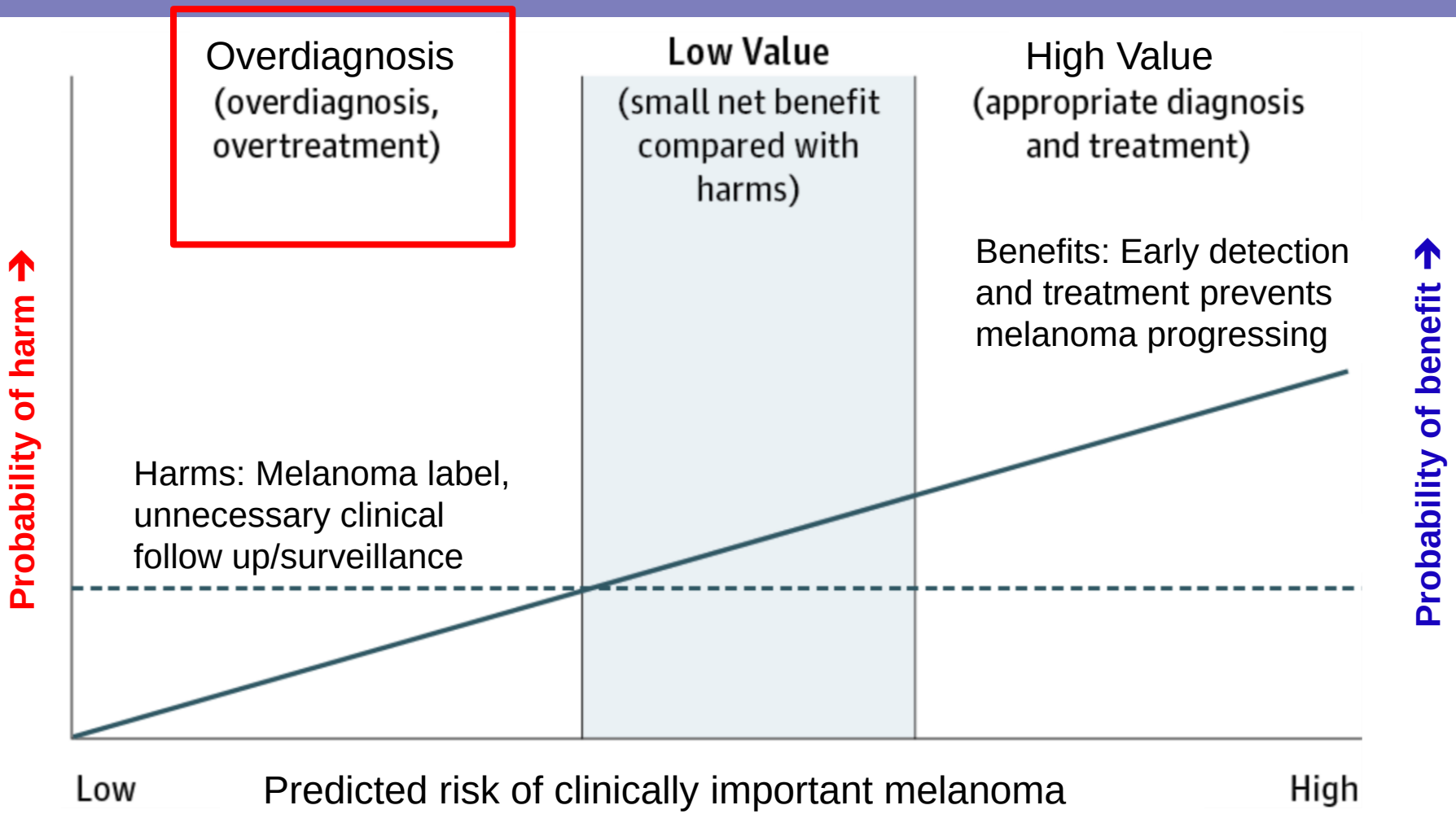
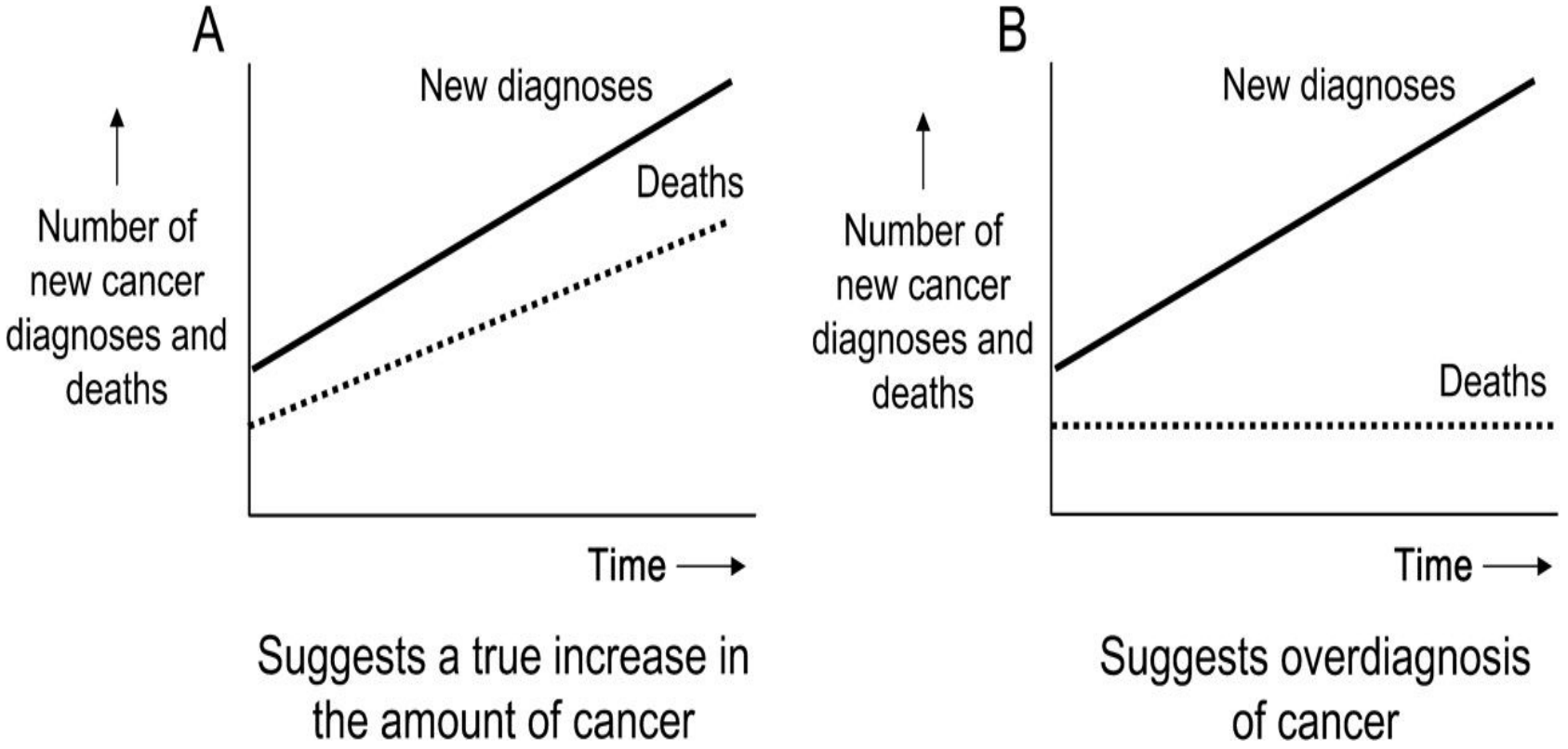
Overdiagnosis more likely in low risk



Adapted from: **Guidance for Modifying the Definition of Diseases. A Checklist**
Doust et al, JAMA Intern Med. 2017;177:1020-1025.

Population data suggesting Overdiagnosis



Welch & Black JNCI 2010

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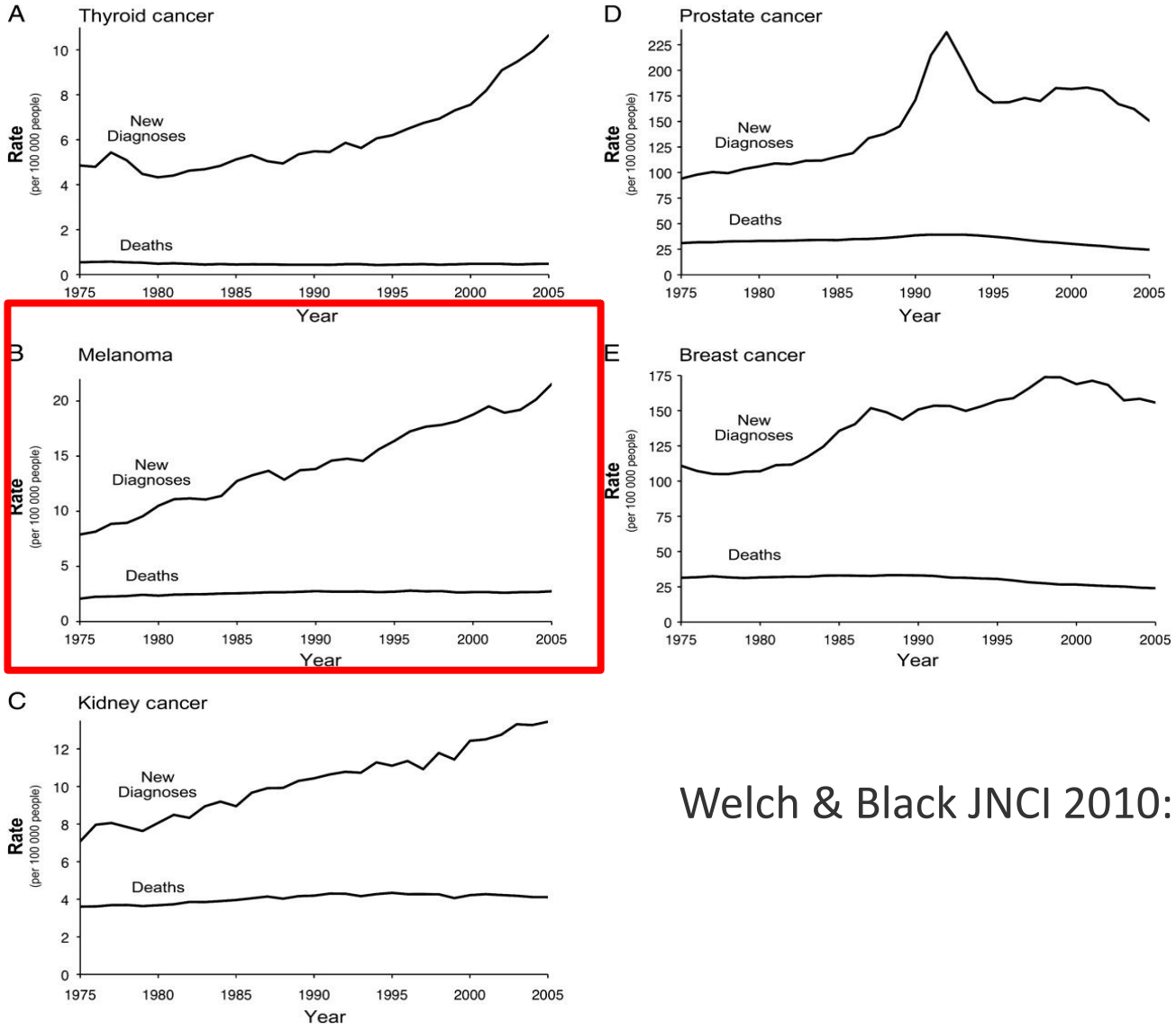
Population data suggesting Overdiagnosis



Welch & Black JNCI 2010: SEER

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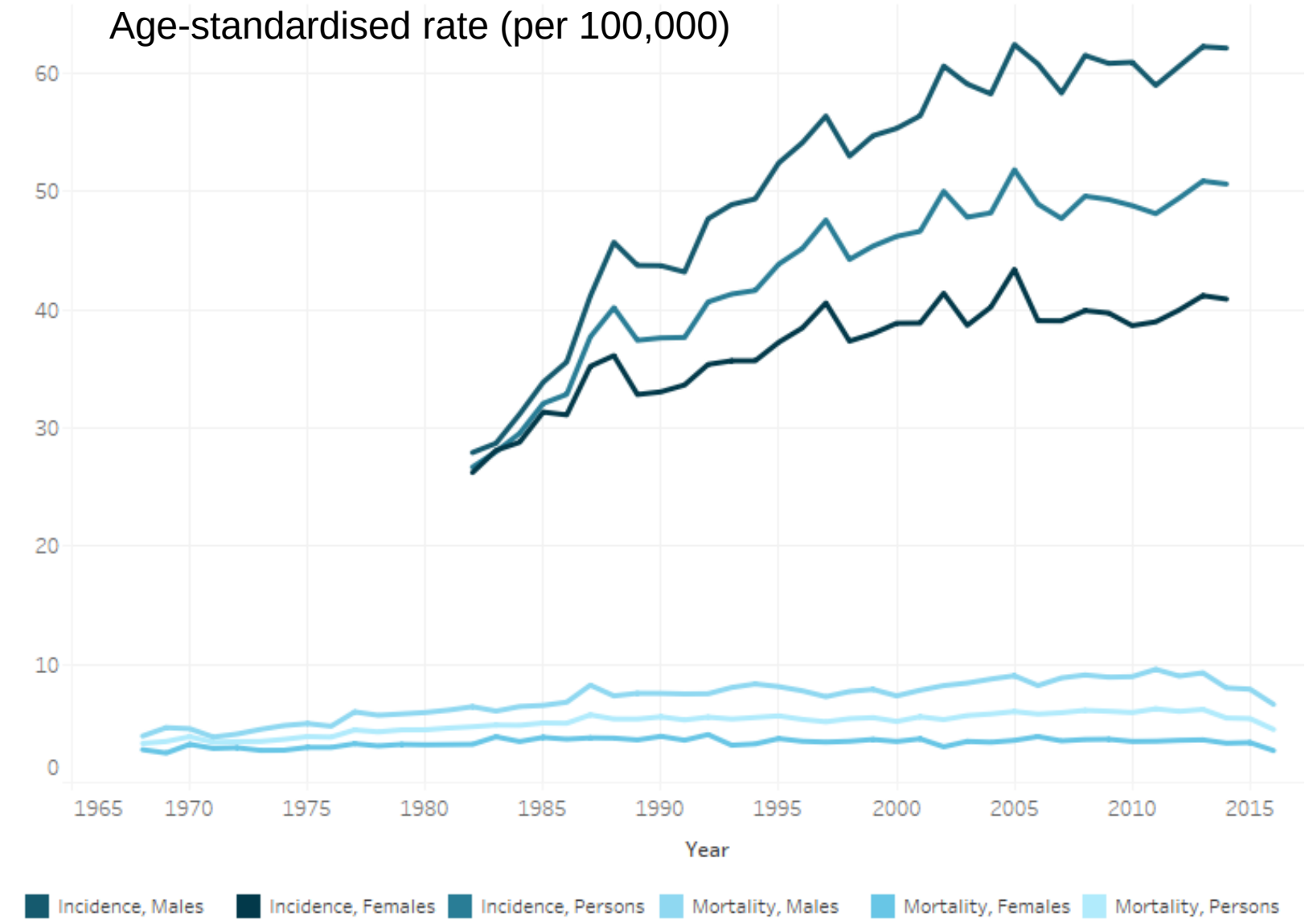
Melanoma Incidence and Mortality rates in Australia



From: AIHW

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Quantifying Cancer Overdiagnosis

Methods for quantifying cancer overdiagnosis
Follow-up of Randomised Controlled Trials (Ideal Method)
Modelling studies
Pathological and imaging studies
Ecological and cohort studies

Carter et al. BMJ 2015

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New method using lifetime risk

BMJ Open

Lifetime risk of prostate cancer overdiagnosis in Australia: quantifying the risk of overdiagnosis associated with prostate cancer screening in Australia using a novel lifetime risk approach

Thanya Pathirana,[1,2] Andrew Hayen,[3] Jenny Doust,[1] Paul Glasziou,[1] Katy Bell[1,4]

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Lifetime risk

- Commonly calculated by cancer agencies

"In 2019 in Australia, it is estimated that the risk of being diagnosed with cancer before age 85 will be 1 in 2"

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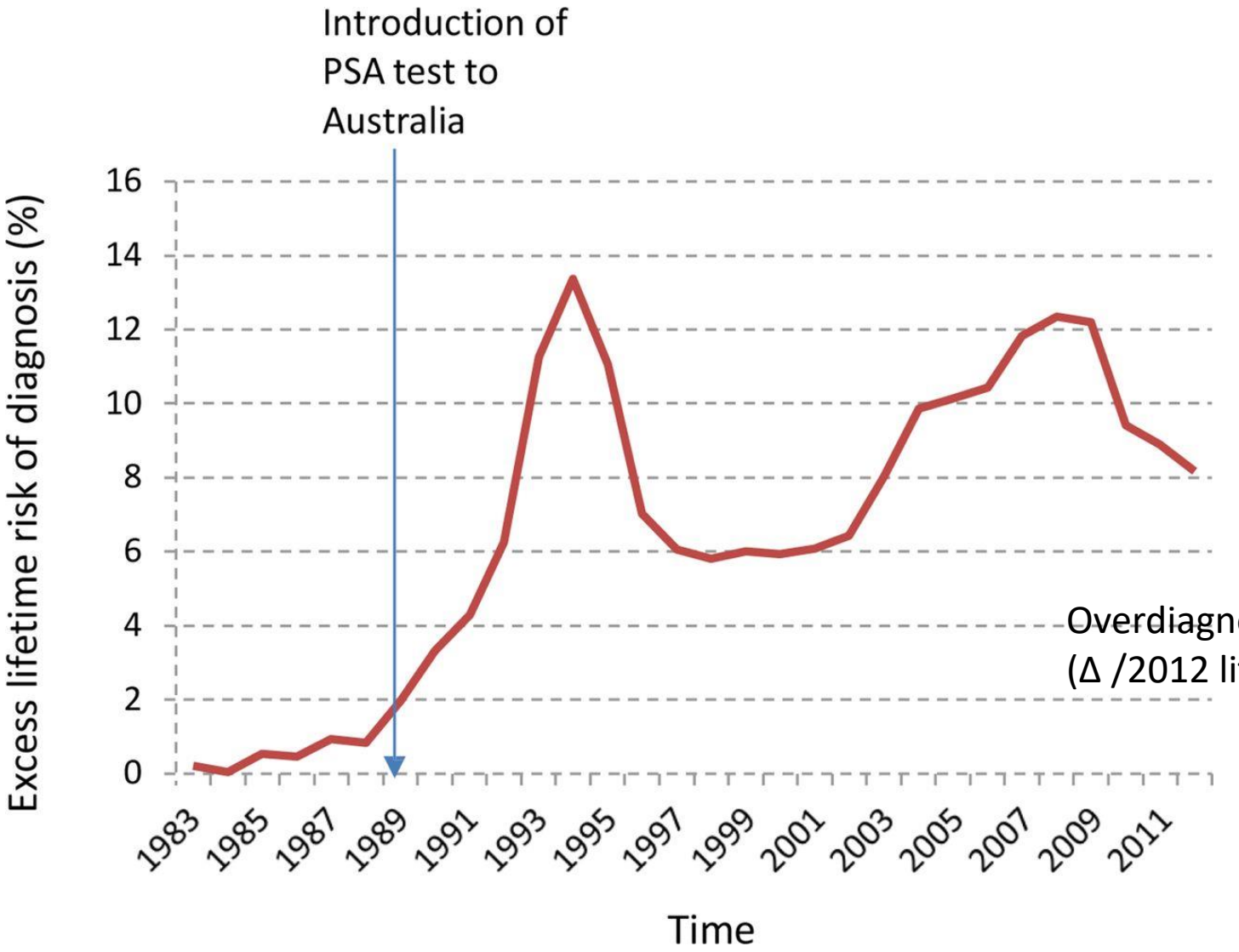
New method using lifetime risk

- Lifetime risk of cancer calculated using Devcan software (NCI, Surveillance Research Program).
- Overdiagnosis estimated by comparing lifetime risk of cancer diagnosis currently (2012) and in the past (1982)
- Current rates of competing mortality used for both time points

Excess lifetime risk of diagnosis of prostate cancer in Australia from 1982 to 2012.



Overdiagnosis = 41 %
(Δ /2012 lifetime risk)

Thanya Pathirana et al. BMJ Open 2019;9:e022457

BMJ Open

Melanoma Overdiagnosis in Australia

- AIHW data on melanoma specific incidence and all cause mortality
- Lifetime risk of a melanoma diagnosis in 1982 and 2012, adjusted for the competing risk of dying from other causes in 2012.
- Lifetime risk for 1982 adjusted upwards to account for:

  1. In-situ melanoma diagnosed in 1982
  not in AIHW data; in-situ rates from Coory et al., Cancer Causes Control 2006

  2. Changes in exposure to risk factors over time to 2012
  Cummulative UV exposure; age-standardised annual percentage change in thick melanoma incidence from Coory et al., Cancer Causes Control 2006 & Aitken et al., Int J Cancer

- Results will be reported in: 'Burden of Cancer Overdiagnosis in Australia'
  by Paul Glasziou, Mark Jones, Thanya Pathirana, Alex Barratt, Katy Bell:
  Currently under review with journal - so watch this space!

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Conclusions

- High rates of melanoma overdiagnosis in Australia
- Majority of overdiagnosed melanomas are in-situ.
- Baseline estimates can be used to measure effectiveness of interventions to reduce overdiagnosis.
- Targeting screening to high risk may reduce overdiagnosis to a minimum unavoidable level.

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