The prevalence of incidental breast cancer and neoplastic precursors: A systematic review of autopsy studies

Ms Elizabeth Thomas[1], Professor Chris Del Mar[1], Professor Paul Glasziou[1], Professor Gordon Wright[1], Professor Alexandra Barratt[2], Dr Katy Bell[1,2]

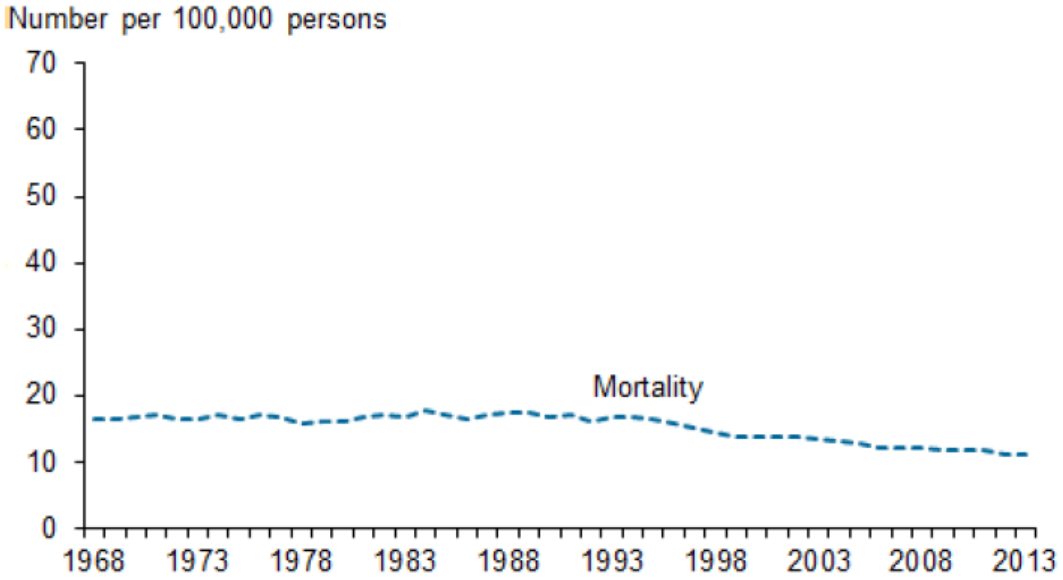
1. Centre for Research in Evidence Based Practice, Bond University, Gold Coast, Australia
2. School Of Public Health, The University Of Sydney, Sydney, Australia

PREVENTING OVERDIAGNOSIS
Winding back the harms of too much medicine

Increasing incidence of breast cancer

- Deaths have decreased 35% (uncertain how much is due to earlier detection)
- Breast cancer increased **50%** in 30 years;

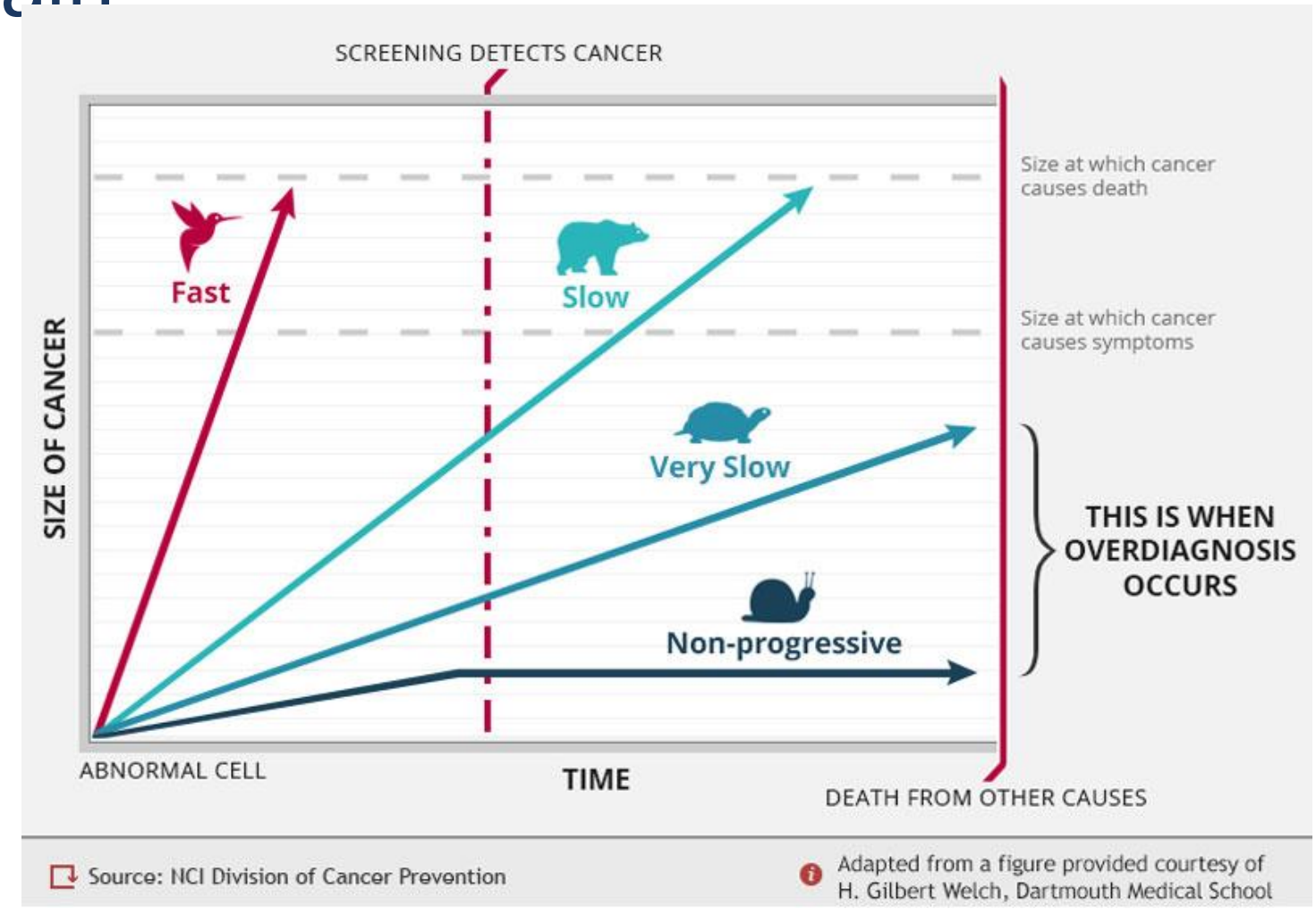
Figure 2: Age-standardised incidence rates for breast cancer 1982–2012 and age-standardised mortality rates for breast cancer 1968–2013



Note: Incidence rates available for 1982–2012, and mortality rates available for 1968–2013.

Source: Australian Institute of Health and Welfare[1]

Overdiagnosis: cancers diagnosed that would never have caused symptoms or death



What is the prevalence of incidental breast cancer and neoplastic precursor lesions found in autopsies?

Previous systematic review undertaken in 1997

- How large is the reservoir of undetected:

1. Invasive breast cancer
2. Carcinoma-in-situ (DCIS/LCIS)
3. Atypical hyperplasia

- Variations of these lesions with age?
- Any other predictors of breast cancer prevalence?

Systematic review of autopsy studies

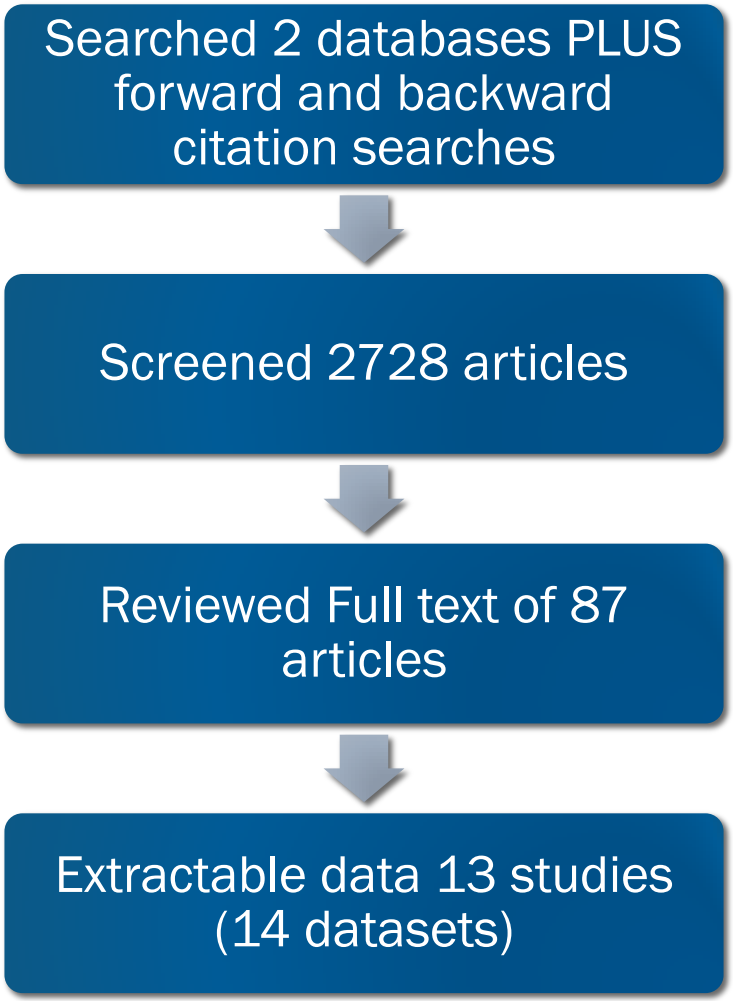
SEARCH FOR:

Autopsy studies of women with no known breast cancer or pathology

FOUND:

13 studies includable

Published 1949 to 2010

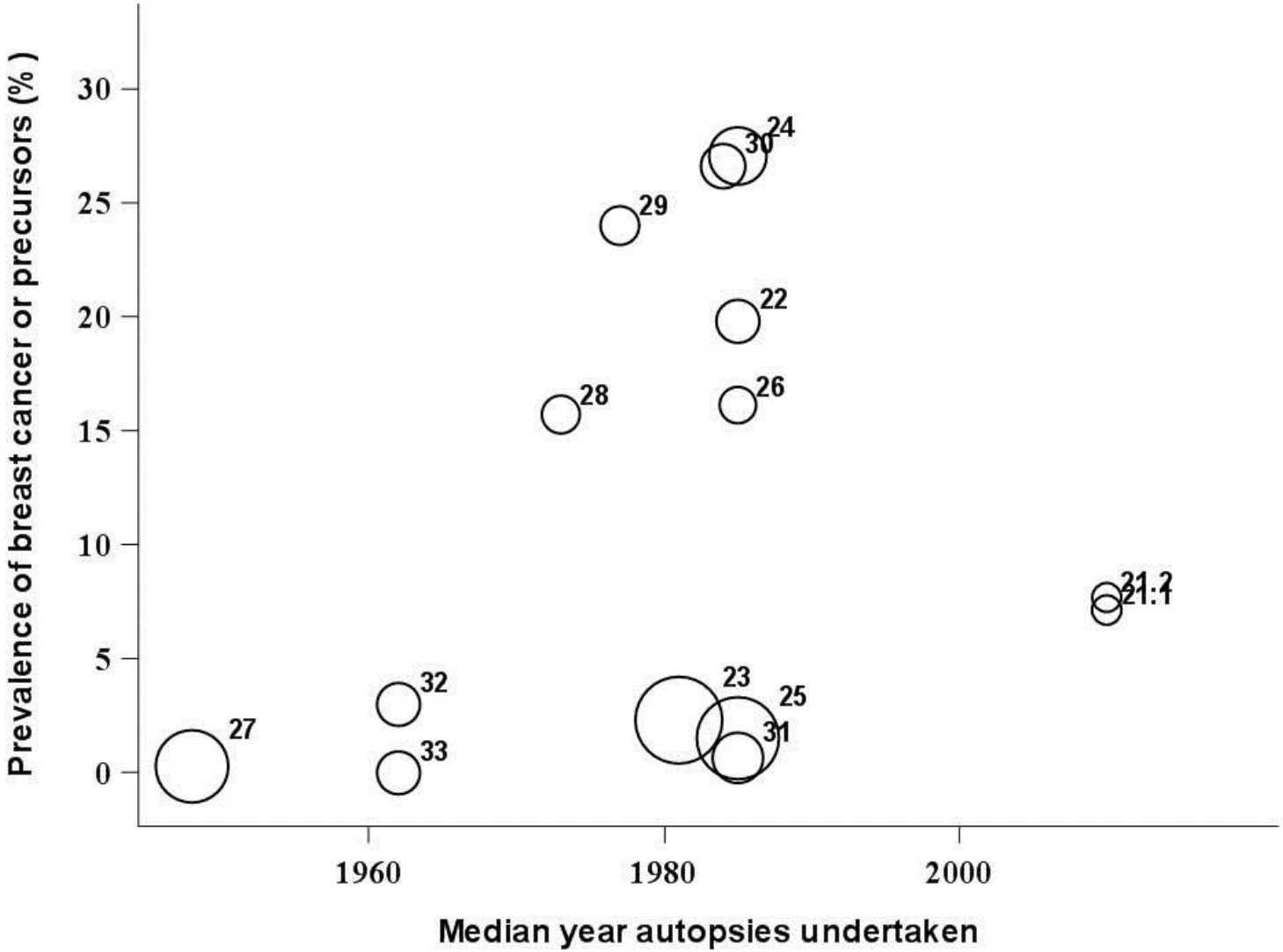


Overall incidental cancer and precursor prevalence

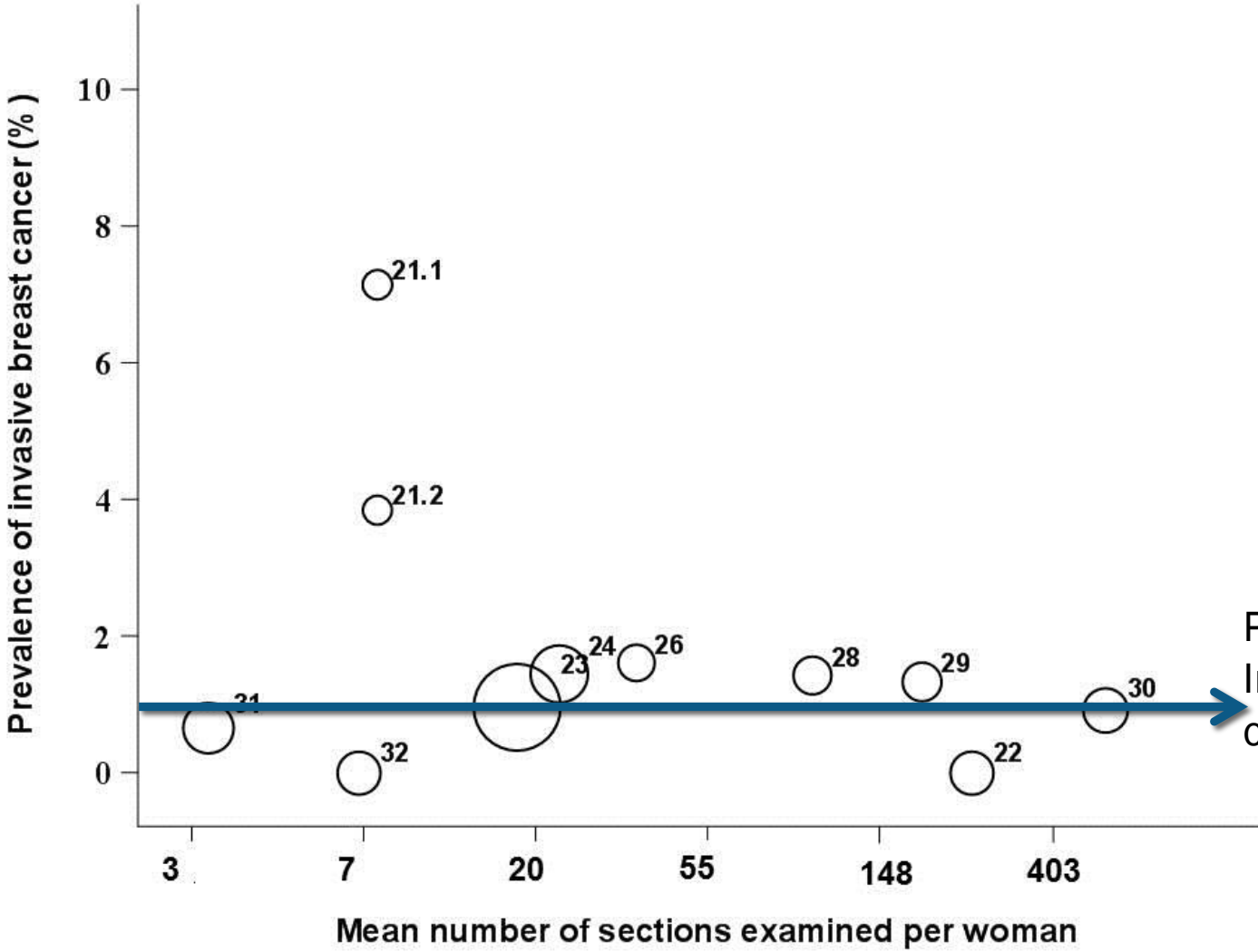
- 0.8% Invasive (no adjustment)
- 8.9% In-situ (less thorough studies adjusted up)
- 9.8% Atypical hyperplasia (less thorough studies adjusted up)

Total = 19.5%

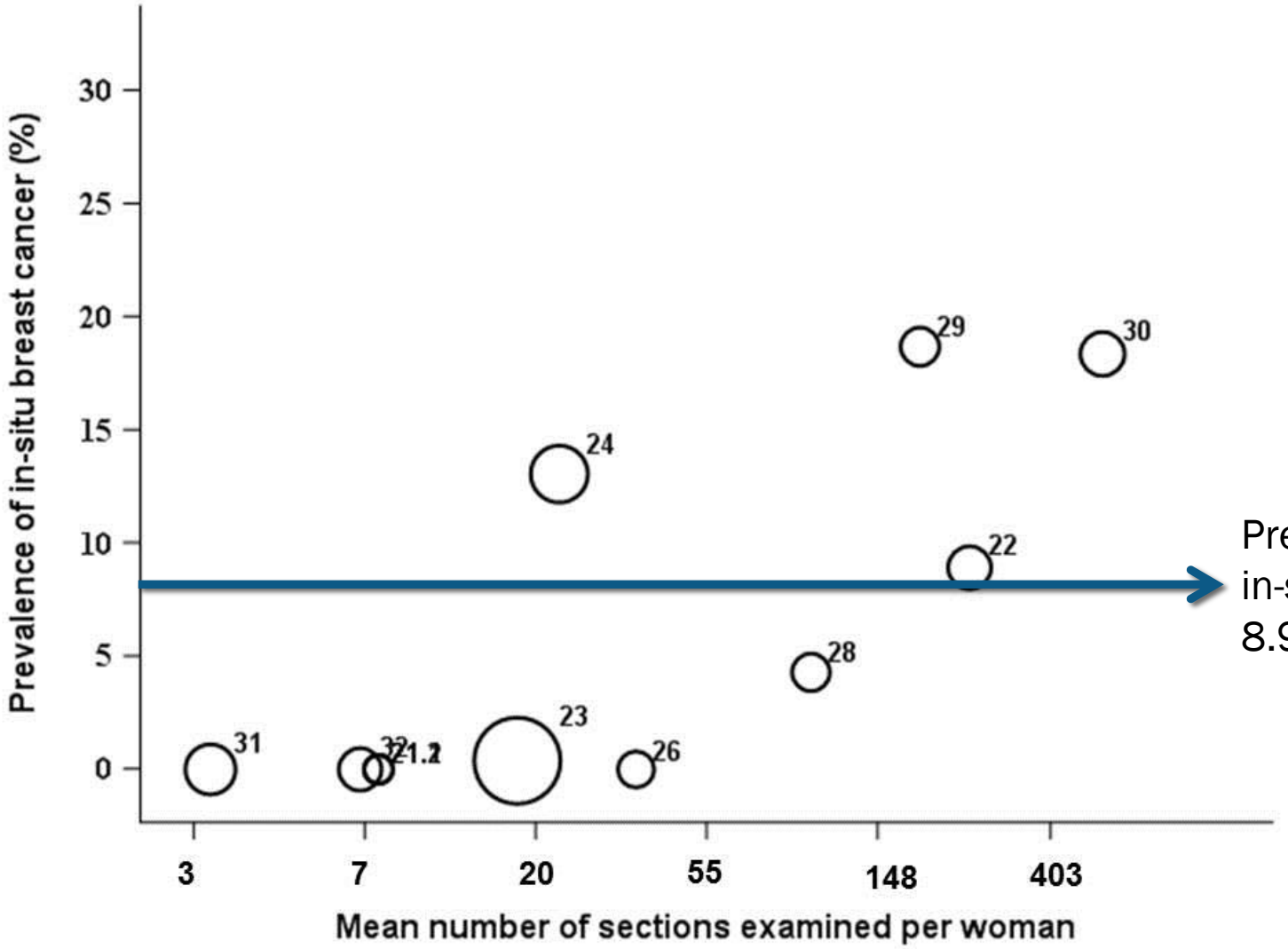
Prevalence over time



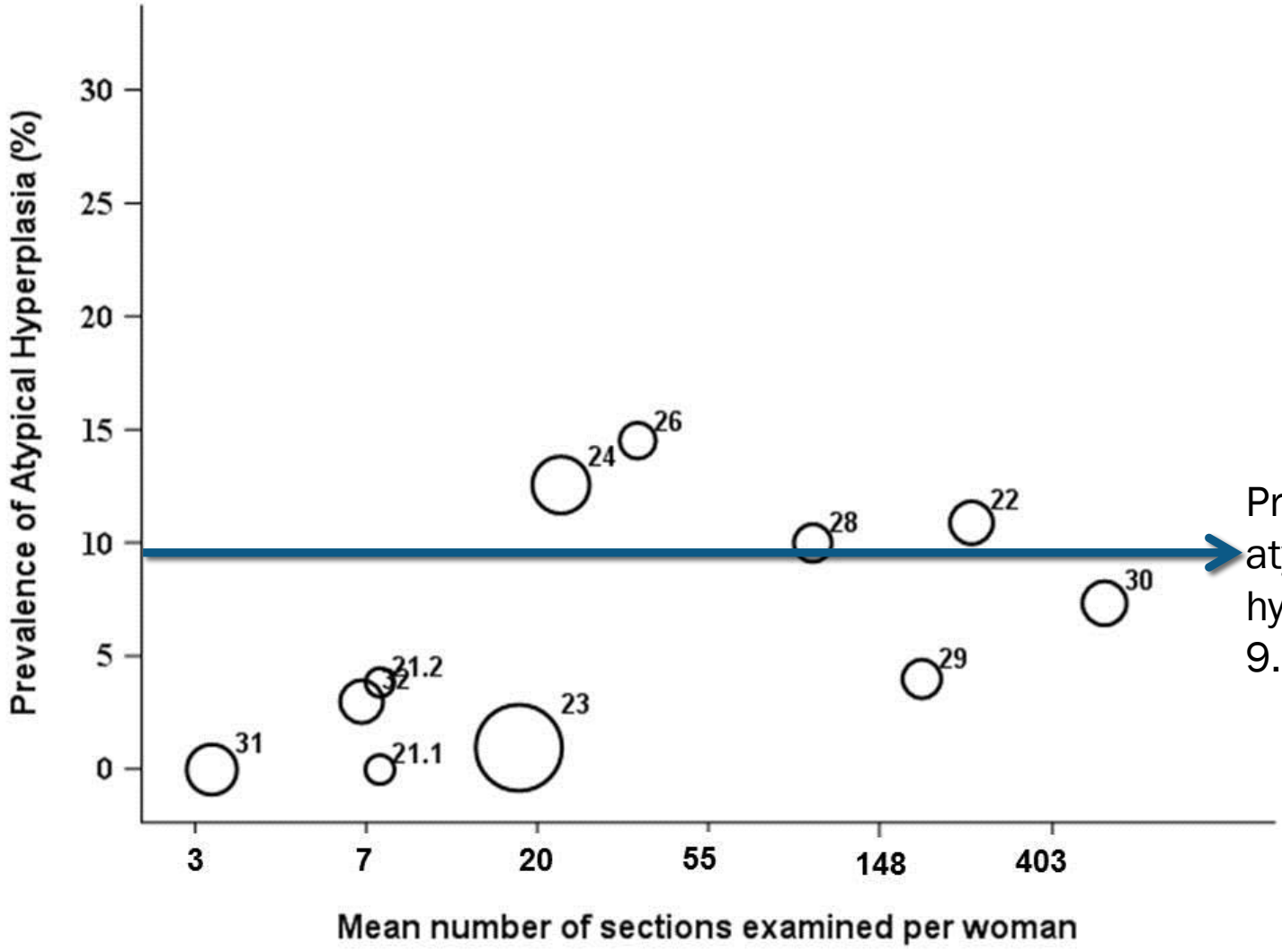
Thoroughness of examination: Invasive breast cancer



Thoroughness of examination: In-situ-carcinoma



Thoroughness of examination: Atypical hyperplasia



Predictors of breast cancer and precursor prevalence

Thoroughness of examination	Invasive cancer		In-situ cancer (DCIS + LCIS)		Atypical hyperplasia (ADH + ALH)	
>20 sections taken on average	OR	P	OR	P	OR	P
	1.1 (0.5-2.7)	0.75	126.8 (20.2-793.0)	<0.001	21.3 (9.7-46.7)	<0.001

Relative size of prevalence pool

Invasive breast cancer

- Rate of incidental **invasive cancer** in autopsies (1%):
- Lifetime risk of diagnosis of invasive breast cancer for women is 12.7%*
- Half of the number of women die from breast cancer (2.7%)

In-situ cancer

- Rate of incidental **in-situ cancer** in autopsies (9%)
- Lifetime risk of diagnosis of in-situ breast cancer for women is 2%*
- 4 x larger than number of cases currently diagnosed in life
- much more likely to be overdiagnosed

❖Based on 2010-2012 data

Conclusions

- Latent cancer and precursors detected in all studies since 1948
- Small reservoir of incidental invasive cancer (approx 1%) found in even the least thorough studies.
- Large reservoir of cancer in-situ and atypical hyperplasia especially in more thorough studies (approx 19%).

Clinical Implications

Over-detection of latent in-situ breast cancer or atypical hyperplasia by screening is highly likely to increase with newer, more sensitive technologies (e.g. digital and 3D mammography)

Expansion of screening programs will also increase risk of overdiagnosis (especially for older women, as they are more likely to die WITH than BECAUSE of cancer).

SDM: Harms, benefits and personal preferences