



# National Work on Breast Cancer Epidemiology, and the NCIN Work Programme

**National Cancer Intelligence Network  
Breast TSSG Clinical Leads Workshop**

26 April 2010

Gill Lawrence, Catherine Lagord, Olive Kearins  
West Midlands Cancer Intelligence Unit

Tel: 0121 415 8129 Fax: 0121 414 7714

E-mail: [gill.lawrence@wmciu.nhs.uk](mailto:gill.lawrence@wmciu.nhs.uk)





# Epidemiology of breast cancer



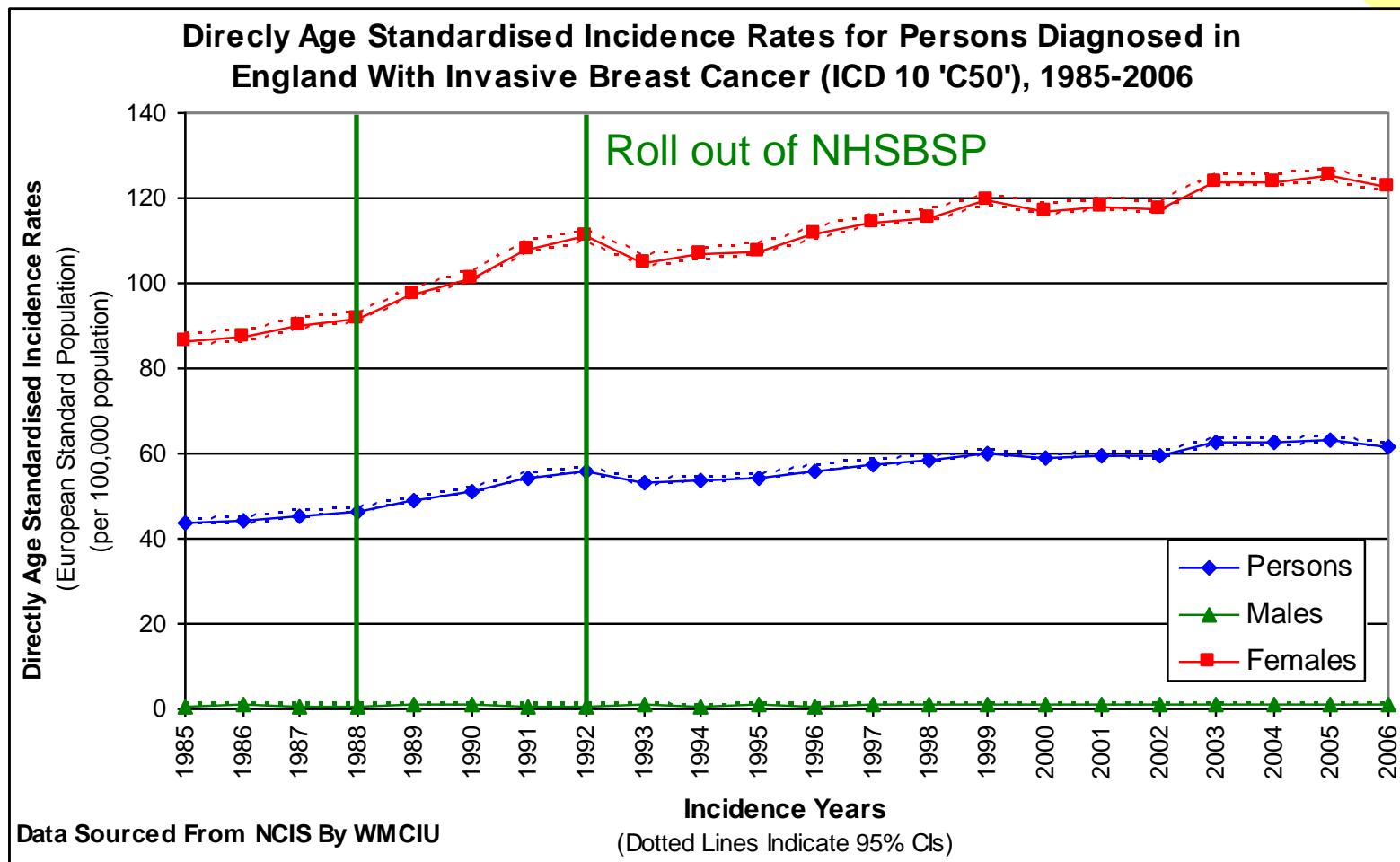
**Epidemiology** - The study of the distribution and determinants of disease in human populations

‘A field that collects data about disease in populations to determine what factors contribute to the development of the disease’



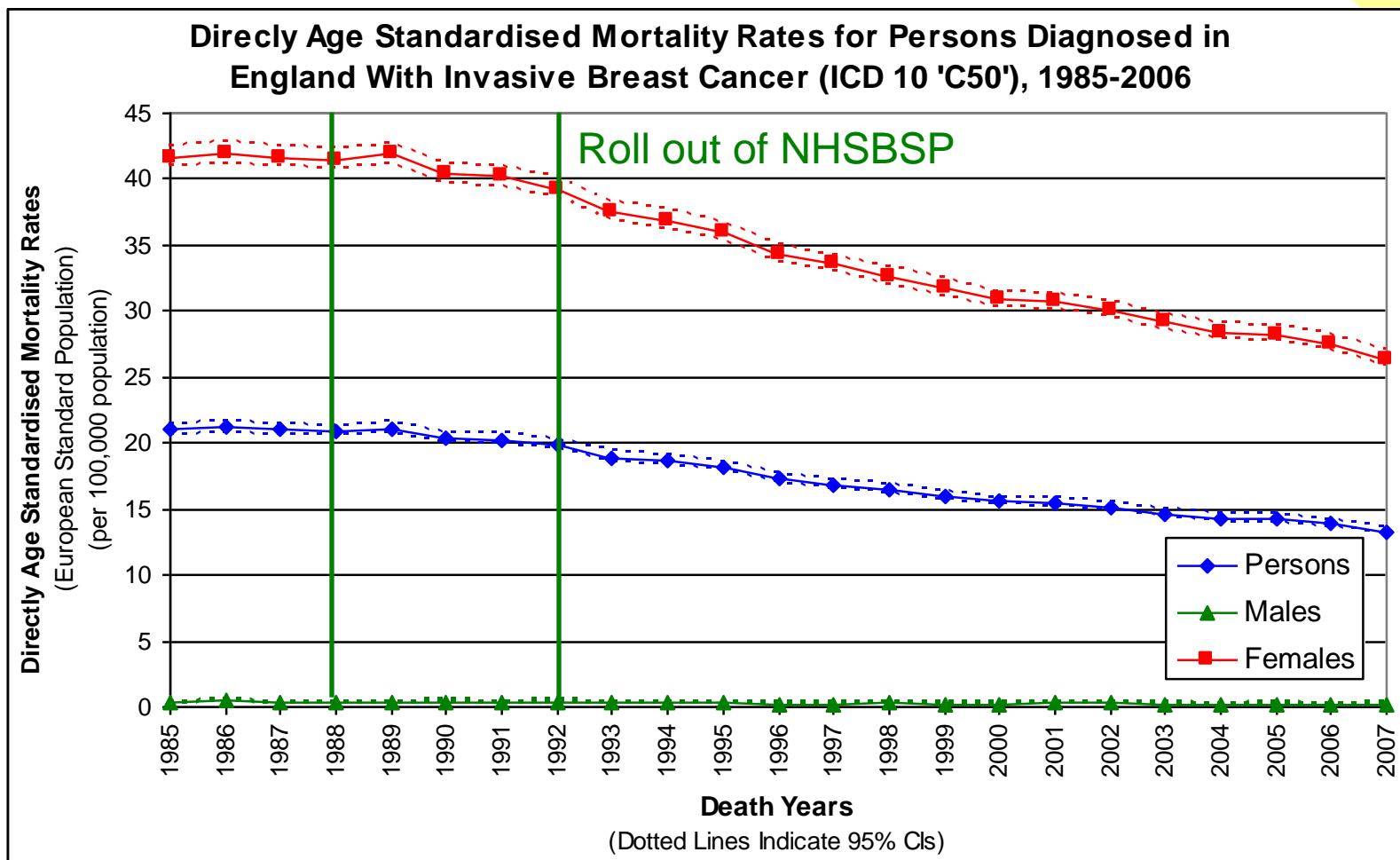
# Breast Cancer Incidence and Mortality

# Breast cancer incidence (England, from NCIS)



# Breast cancer mortality

## (England, from NCIS)



# Risk factors for breast cancer



- Gender

- Age

- Family history
- Ethnicity

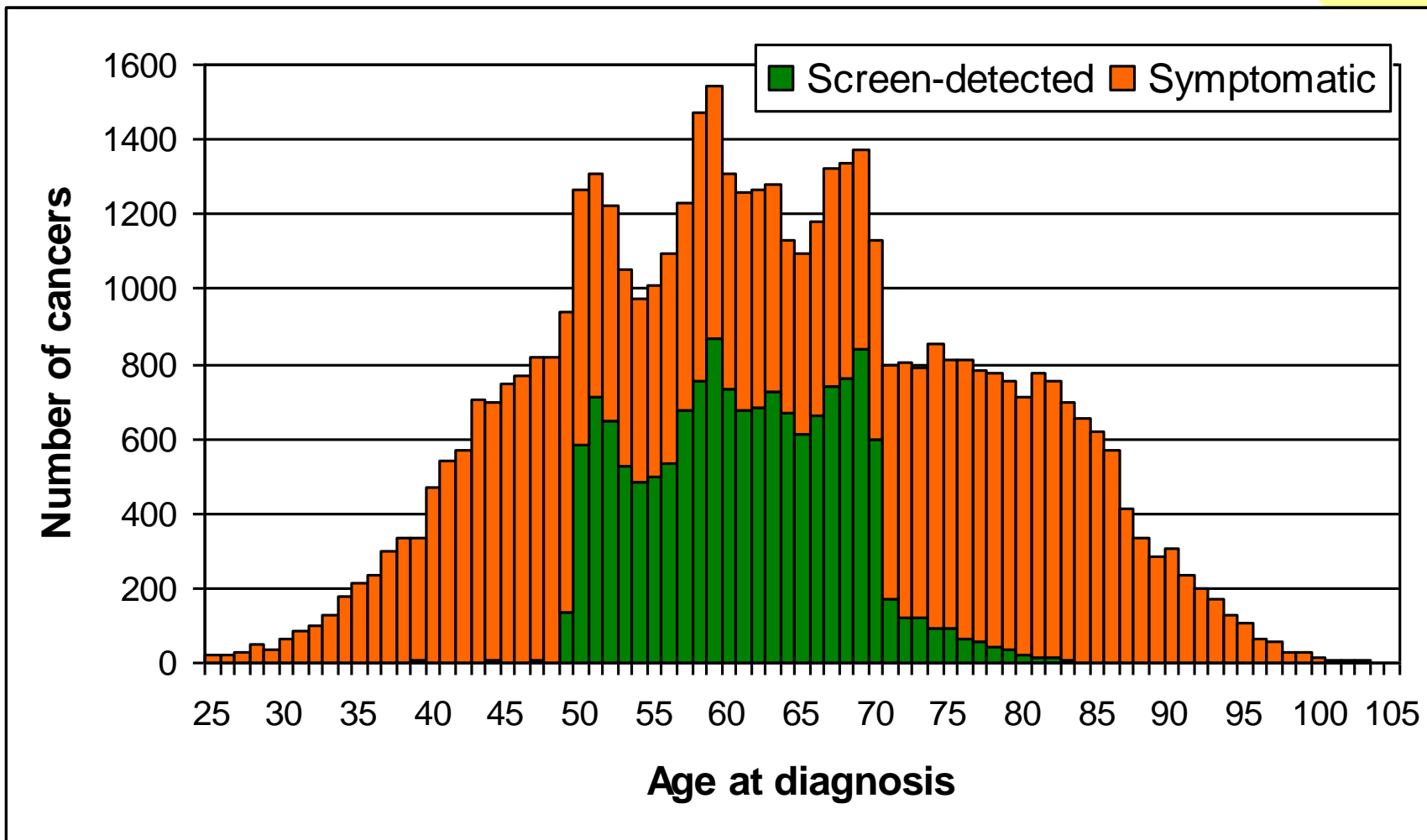
Influence  
incidence rates  
and age profiles

- Lifestyle

- Affluence
- Parity
  - ❖ number of children,
  - ❖ maternal age at first birth
- HRT usage
- Weight (Post menopausal)
- Alcohol consumption

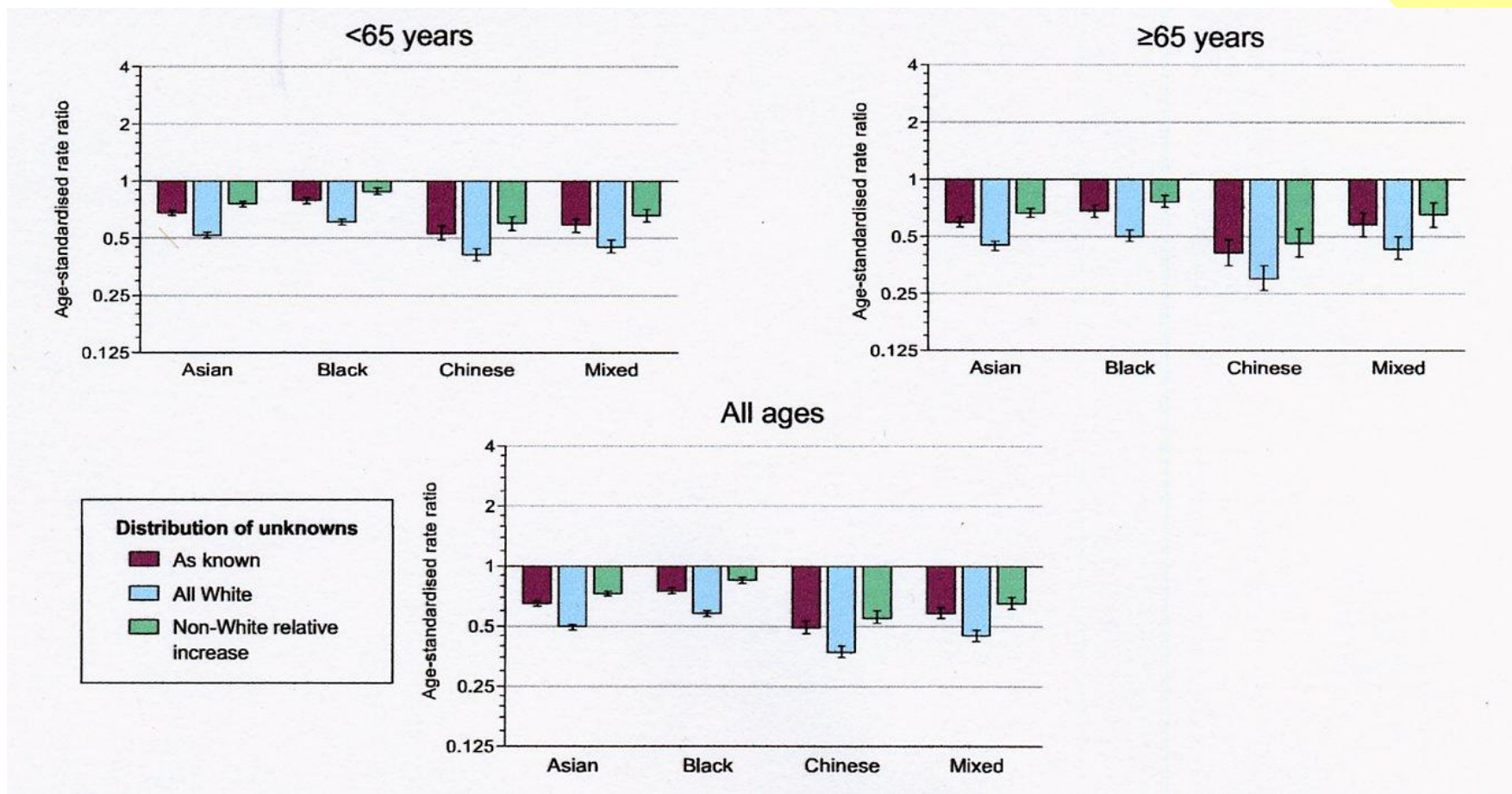
All related to  
exposure to  
oestrogen

# Age at diagnosis breast cancer 2006



# Ethnicity

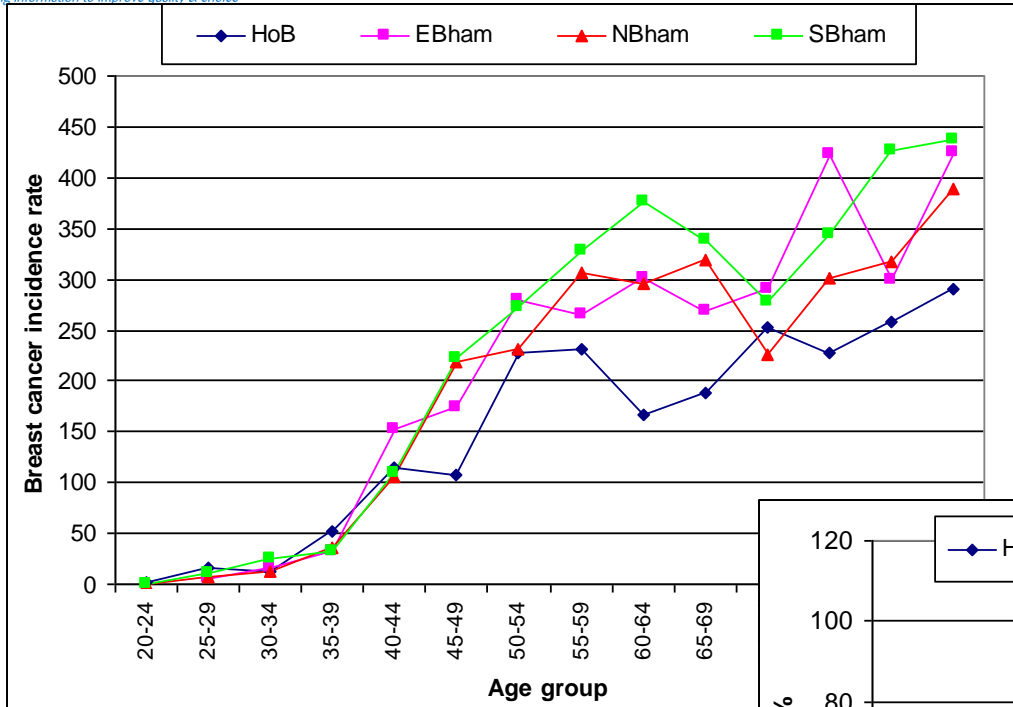
## breast cancer incidence 2002-2006



NCIN Cancer Incidence and Survival by Major Ethnic Group England 2002-2006



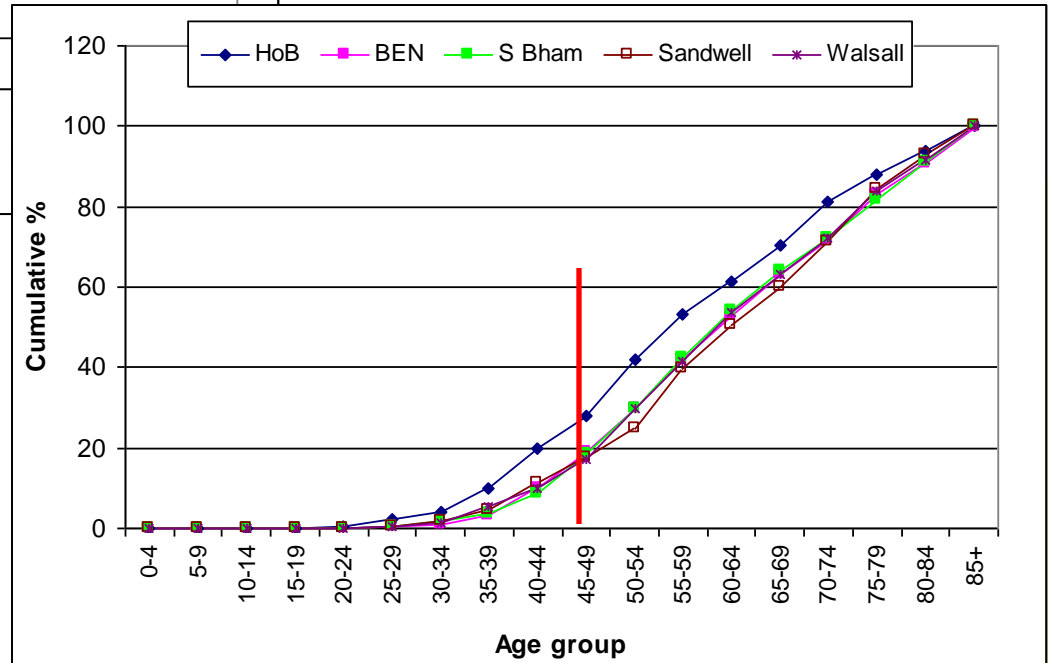
# Breast cancer - age profile



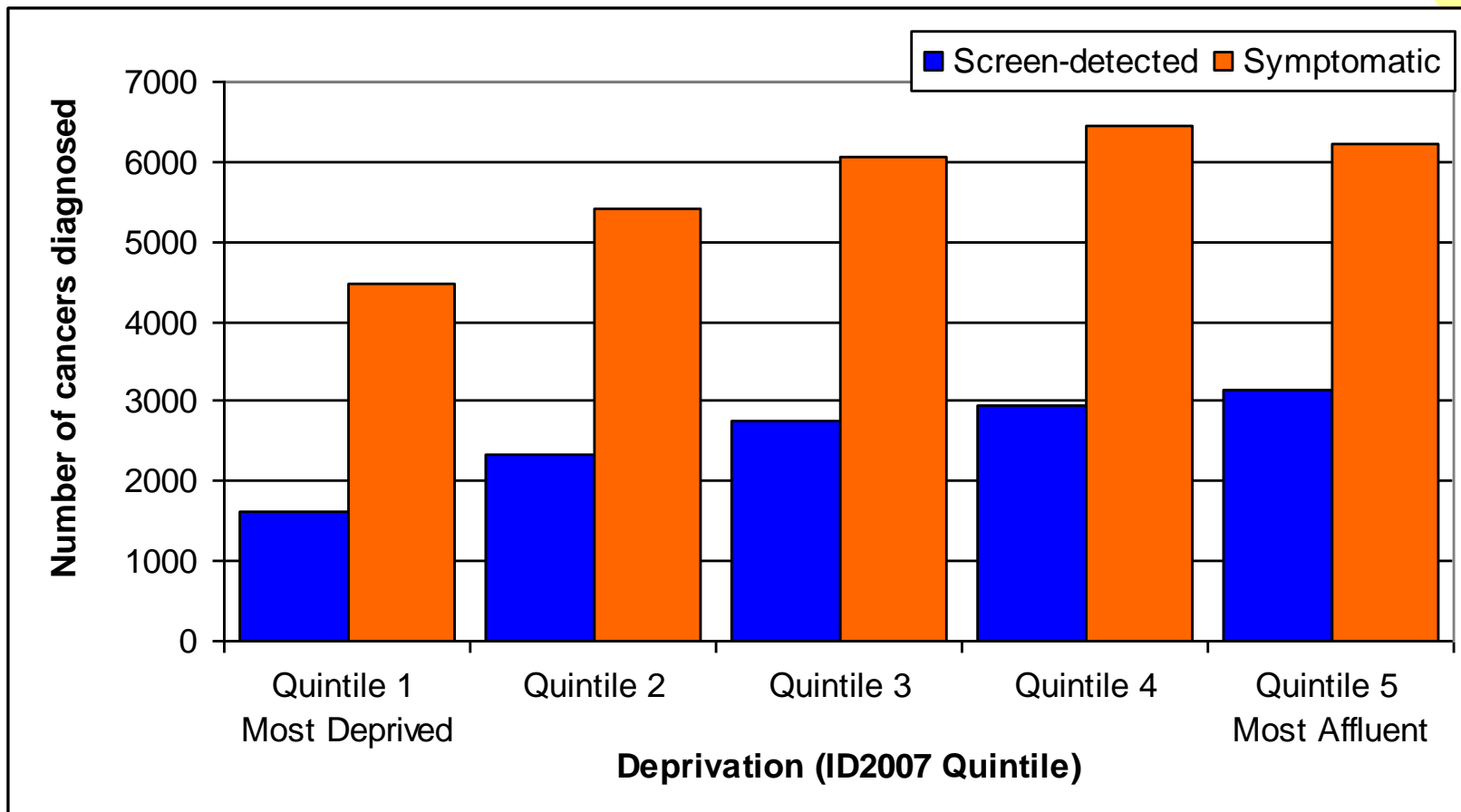
Incidence 2002-2004

Lower incidence in HoB where 70% population is in ethnic minority group

But....  
28% of cancers in HoB occur in the under 50s compared with 18% in other PBCN PCTs



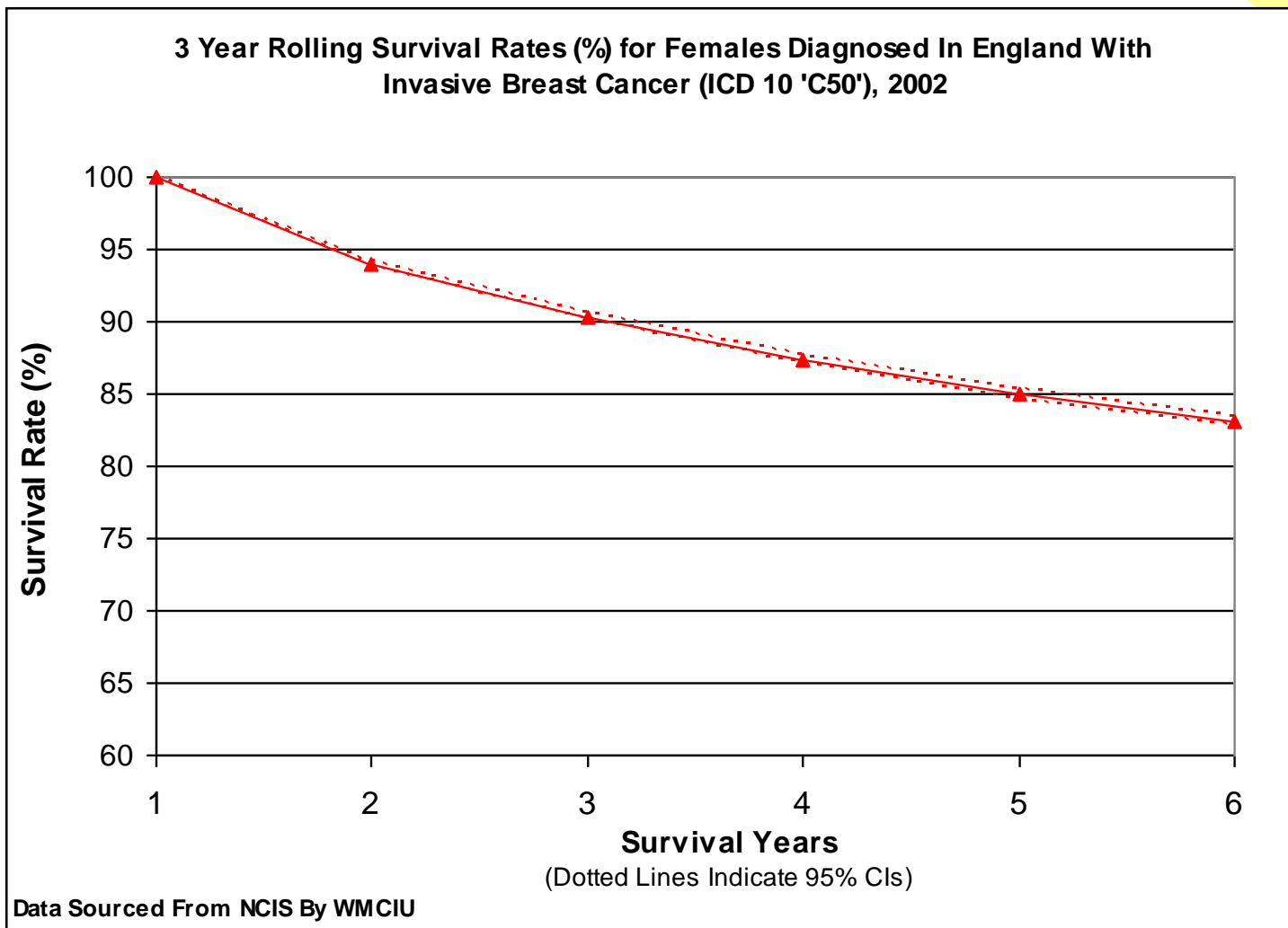
# Affluence/deprivation breast cancer 2006 (England)





# Breast Cancer Survival

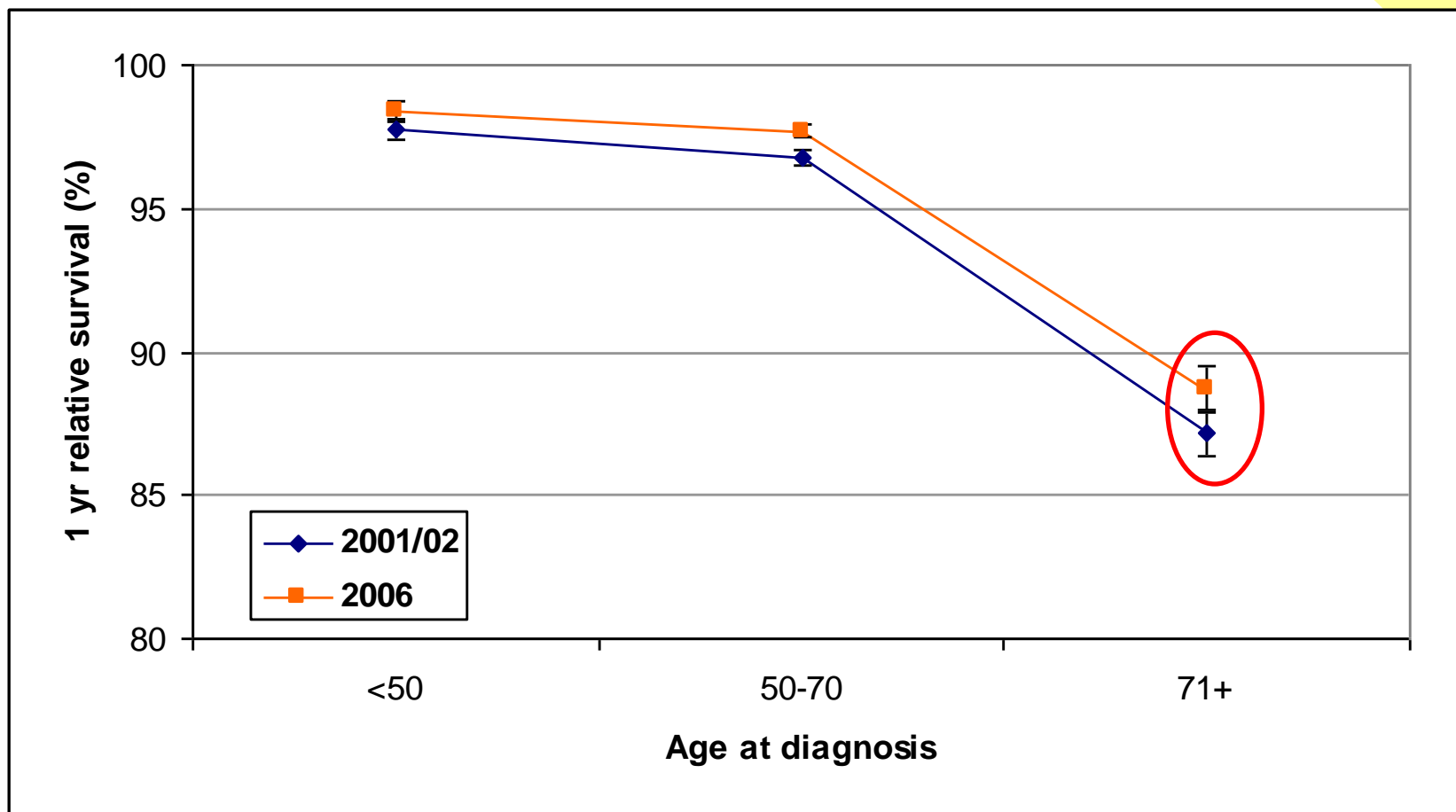
# Breast cancer survival (England, from NCIS)





# Age at diagnosis

## 1-year relative survival

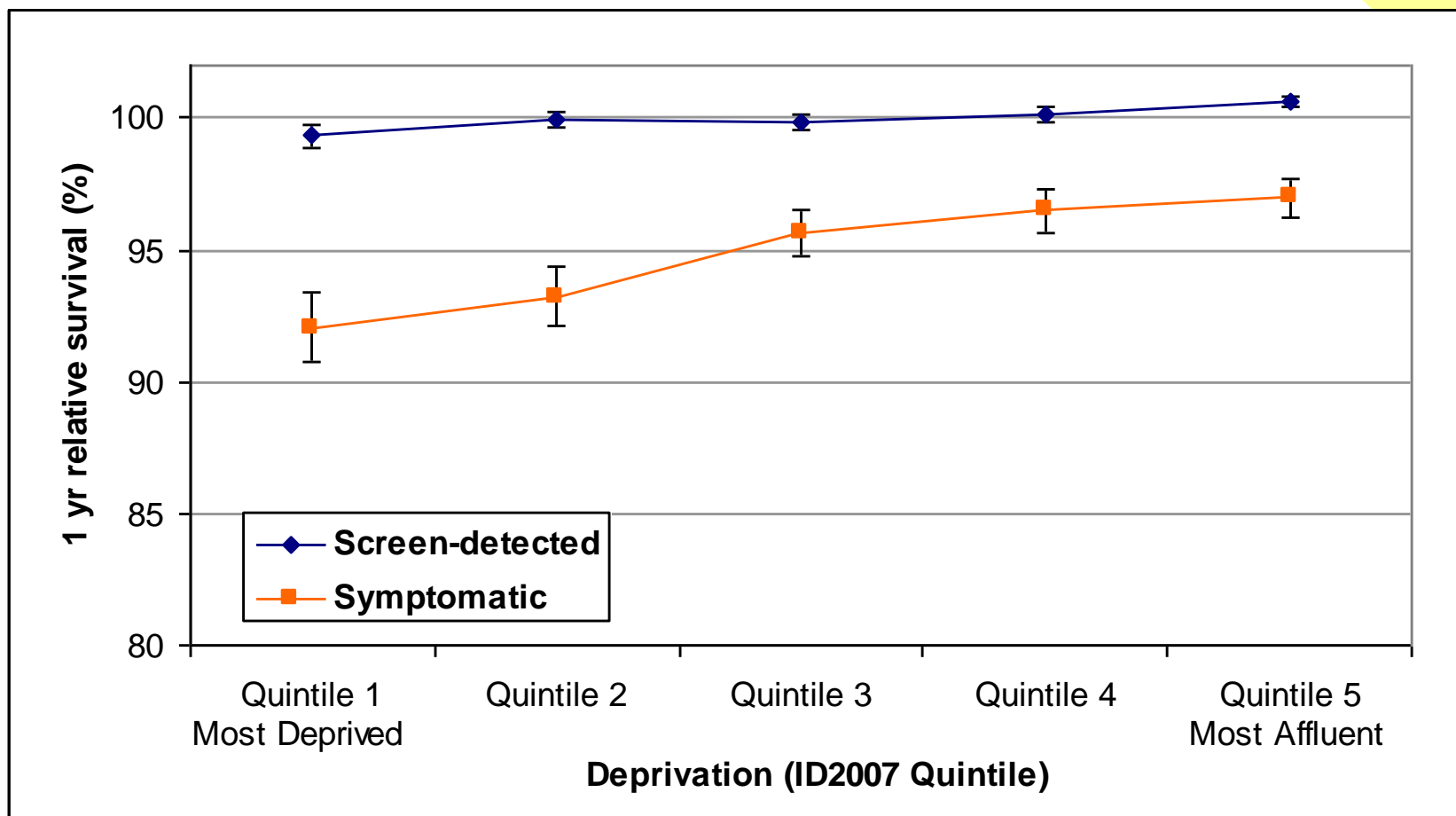


All Breast Cancers Report, 2009

Patients in England diagnosed with breast cancer in 2001/02 and 2006

# Deprivation

## 1-year relative survival

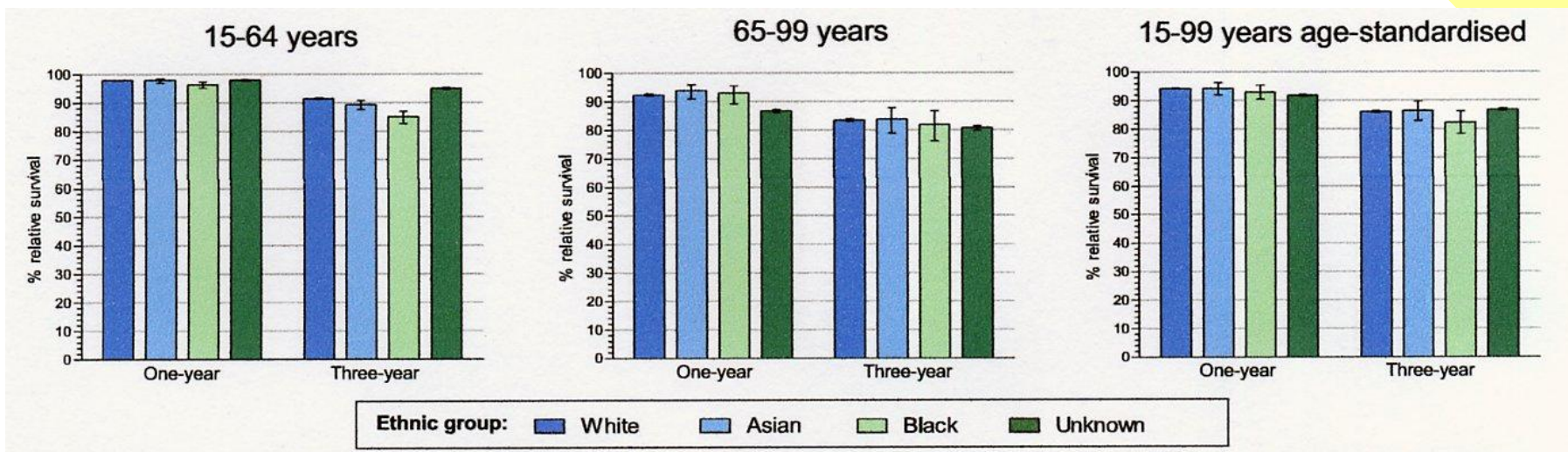


All Breast Cancers Report, 2009

Patients in England diagnosed with breast cancer in 2001/02

# Ethnicity

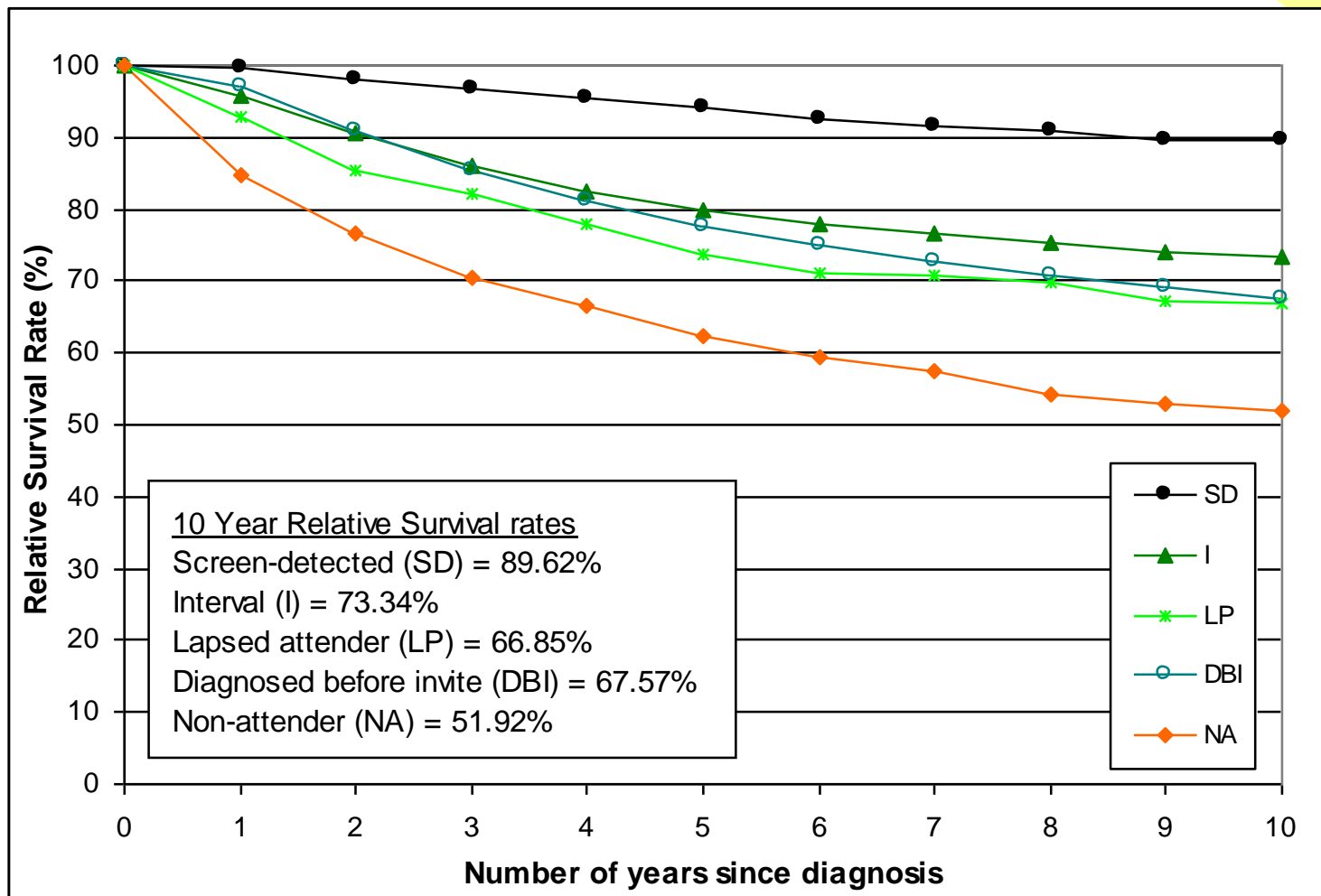
## 1-year relative survival



Age standardised relative survival - no significant differences at 1 or 3 years  
 15-64 years - 1-year survival in Black ethnic group significantly lower  
 15-64 years - 3-year survival in Black and Asian ethnic groups significantly lower  
 65-99 years - no significant differences at 1 or 3 years

# Route of presentation

## 10-year relative survival



Breast cancers diagnosed in West Midlands J Med Screening (2009) 16: 186-192





*Better information on cancer services will drive up service quality, enhance patient choice and underpin stronger commissioning*



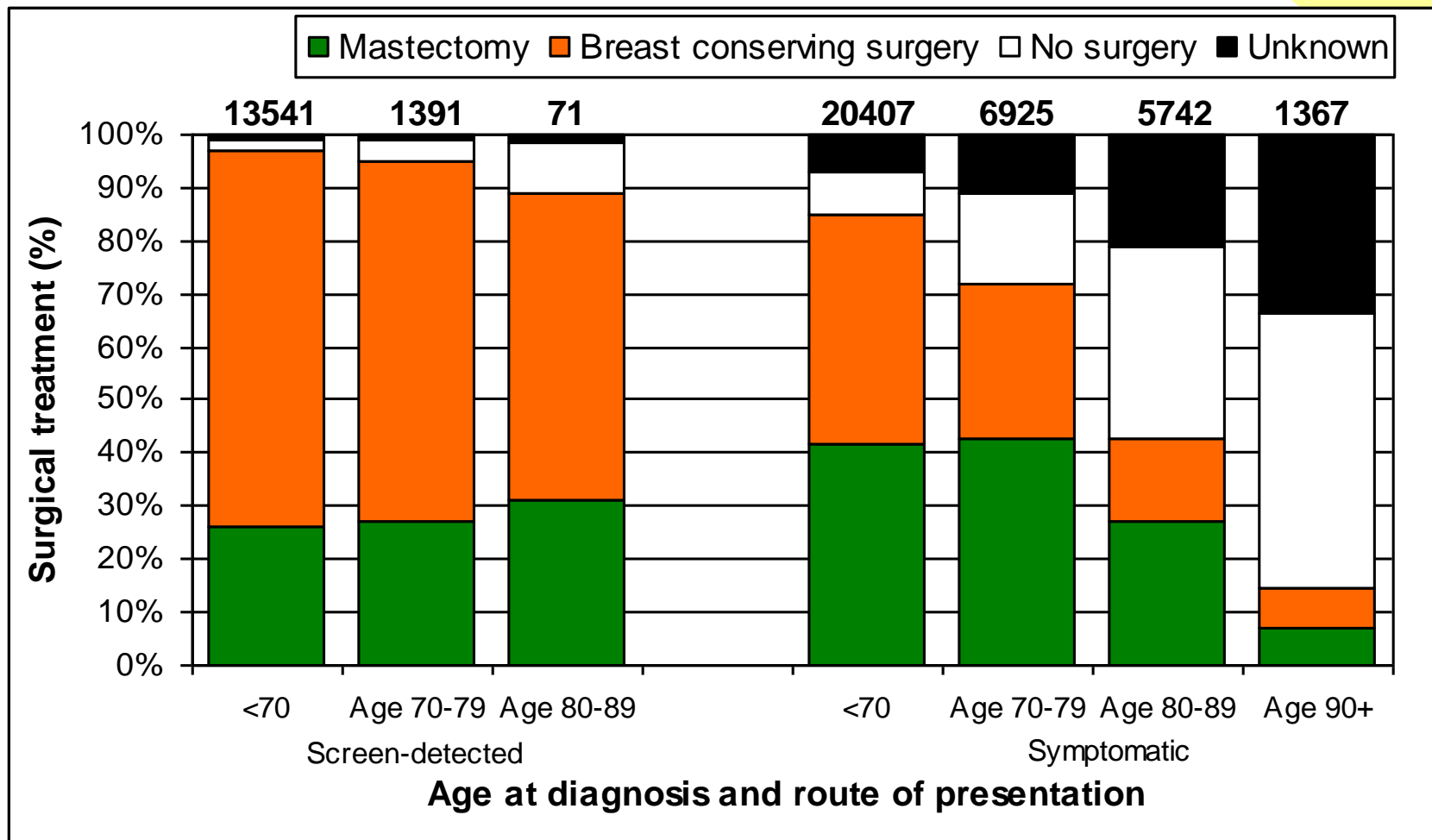
## NCIN Breast Cancer TSSG Work Programme

# What are the main issues in breast cancer?



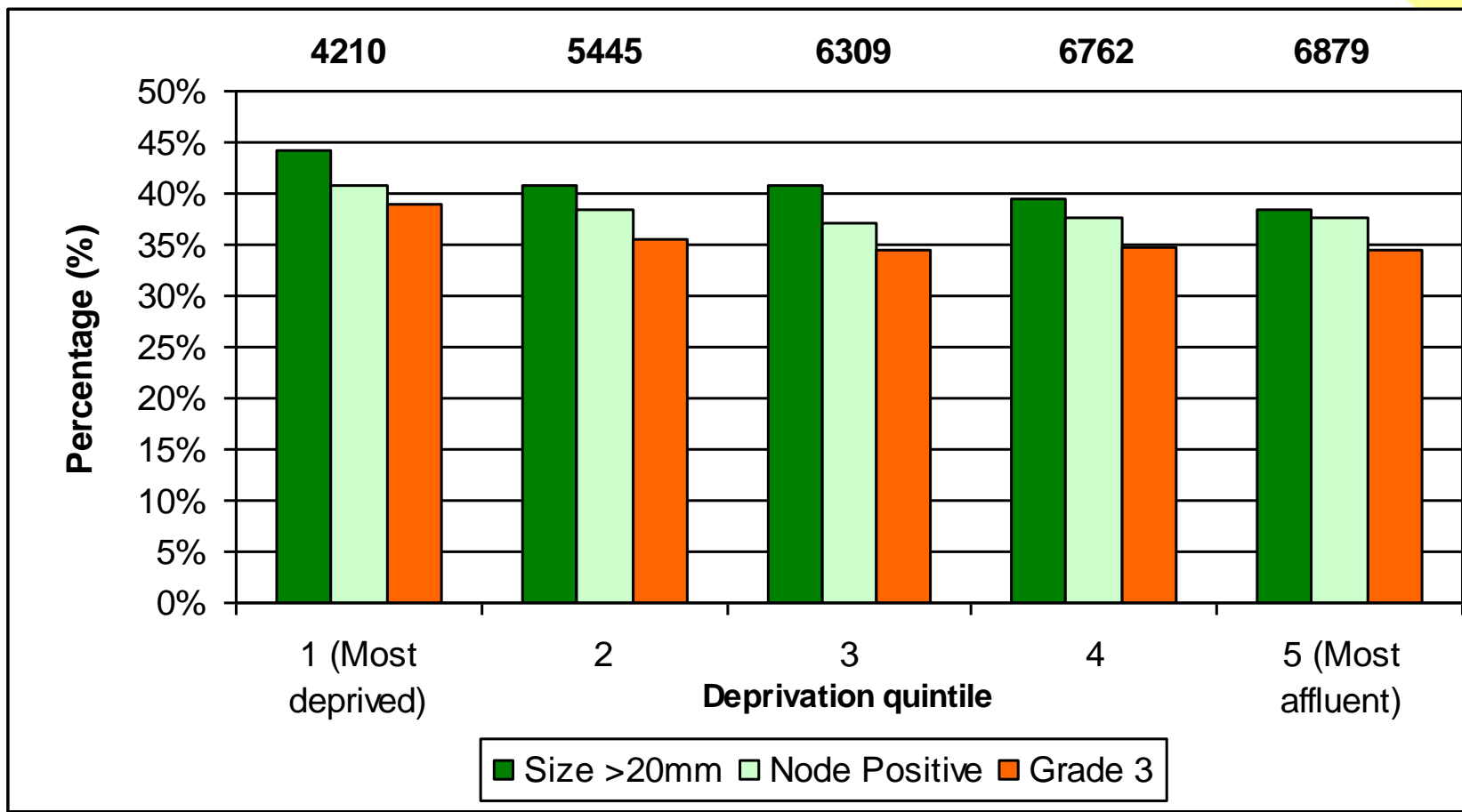
- Inequalities in outcome
  - Age
  - Deprivation
  - Ethnicity
- Quality of treatment
  - Adherence to clinical guidelines - IOG, NICE, diagnostic
  - Peer review - key clinical issues, clinical lines of enquiry
  - Survivorship - recurrences, long term effects
- Over-treatment?
  - Non-invasive breast cancer
    - ❖ Surgery to the breast tumour  $\pm$  radiotherapy
    - ❖ Hormone therapy for ER positive cancers
    - ❖ Axillary surgery
  - Chemotherapy for very early stage invasive breast cancer
- Follow up regimens

# Surgical treatment variation with age



Patients in England diagnosed with breast cancer in 2006

# Tumour characteristics variation with deprivation

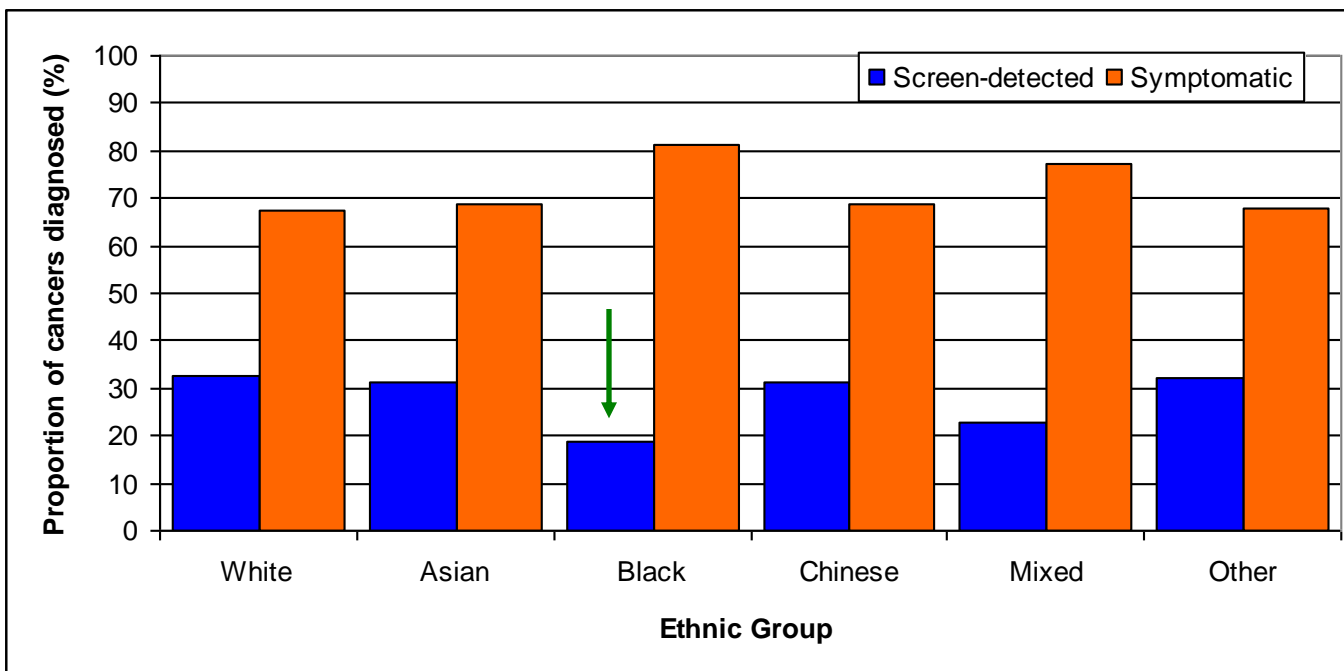


Patients in England diagnosed with breast cancer in 2006

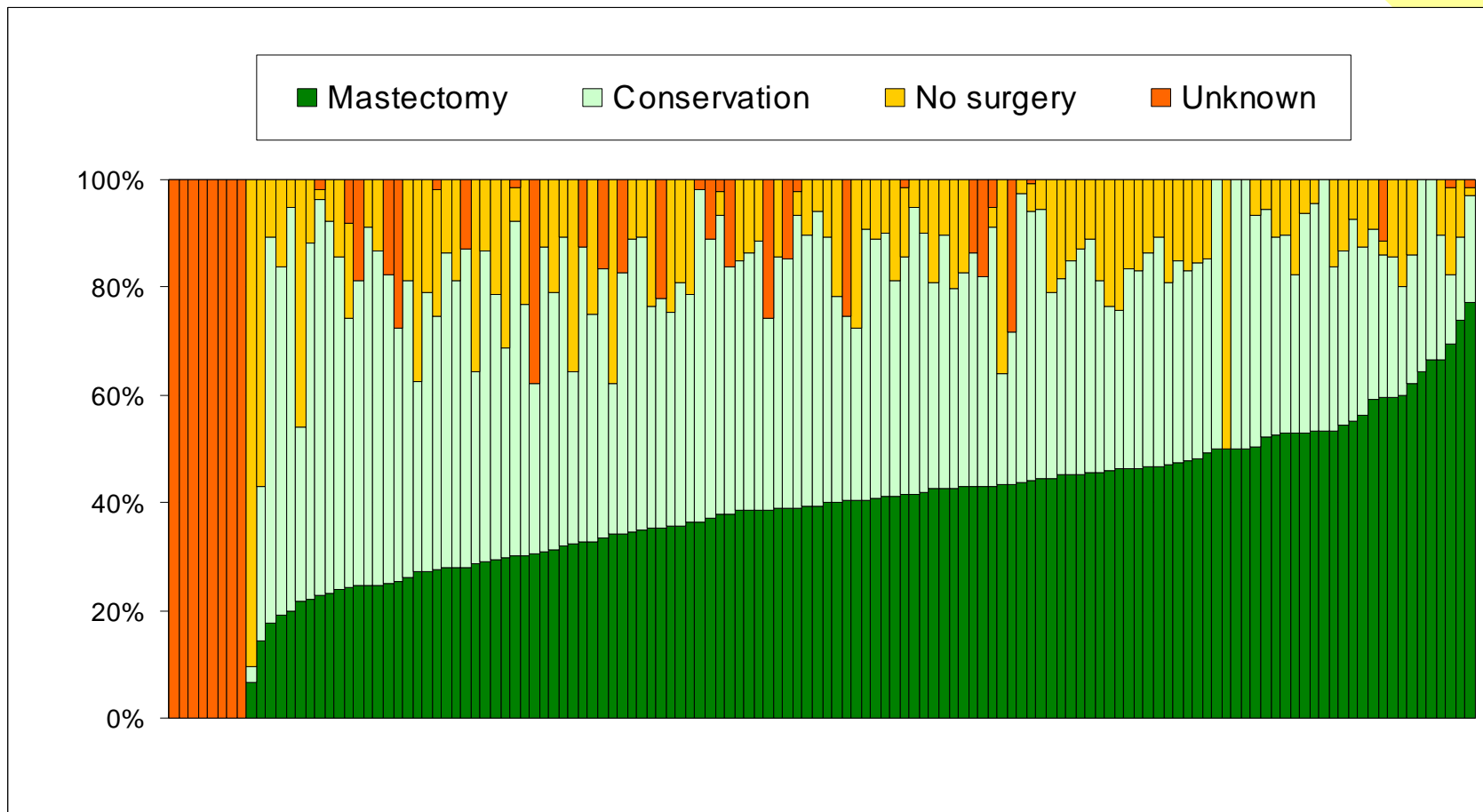
# Ethnicity presentation route



Ethnic group	Screen-detected		Symptomatic		Total cases
	No.	%	No.	%	
White	8,746	33	18,061	67	<b>26,807</b>
Asian	191	31	420	69	<b>611</b>
Black	81	19	347	81	<b>428</b>
Chinese	23	31	51	69	<b>74</b>
Mixed	22	23	75	77	<b>97</b>
Other	72	32	151	68	<b>222</b>
<b>Total</b>	<b>9,135</b>	<b>32</b>	<b>19,104</b>	<b>68</b>	<b>28,239</b>

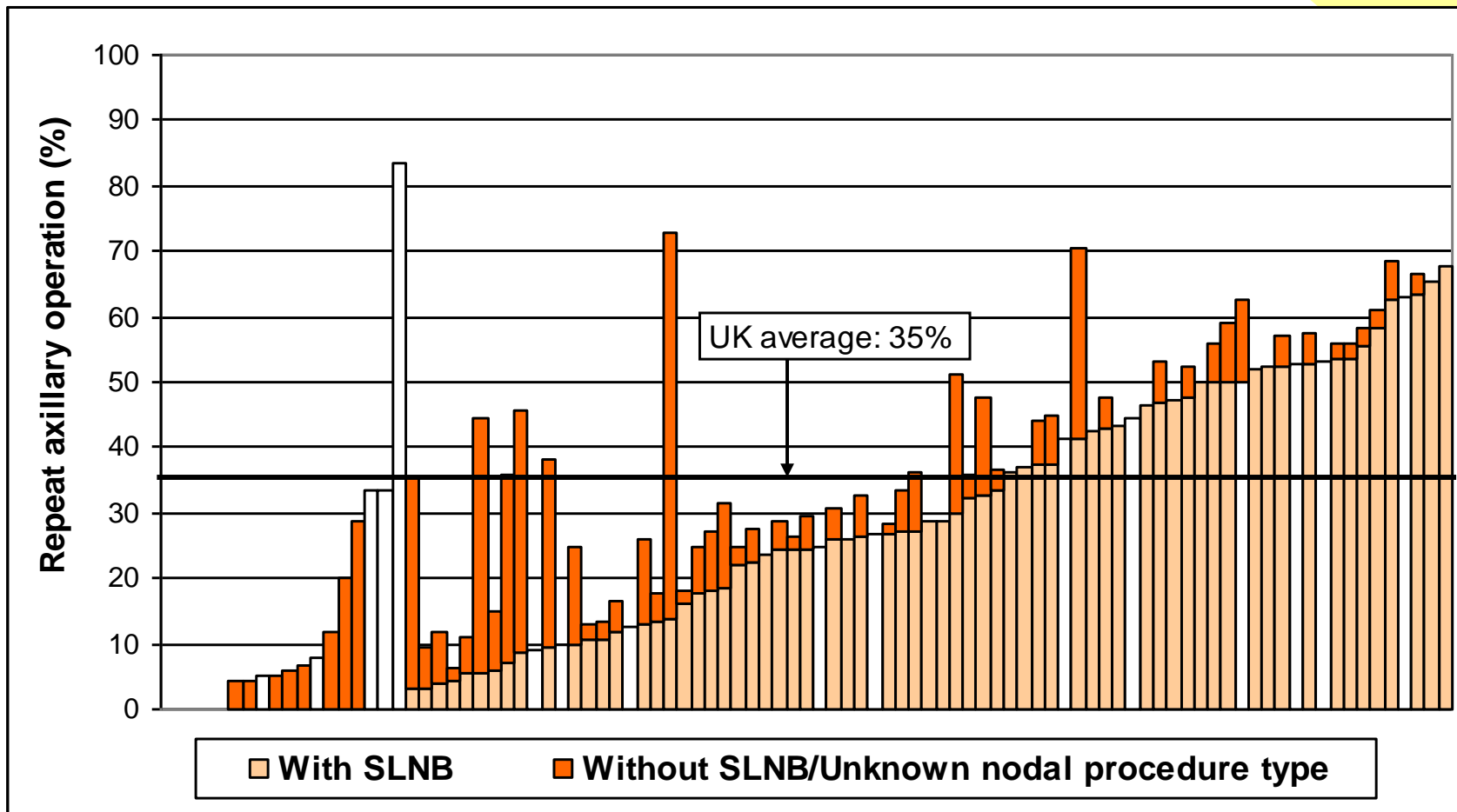


# Surgical caseload and type of surgery



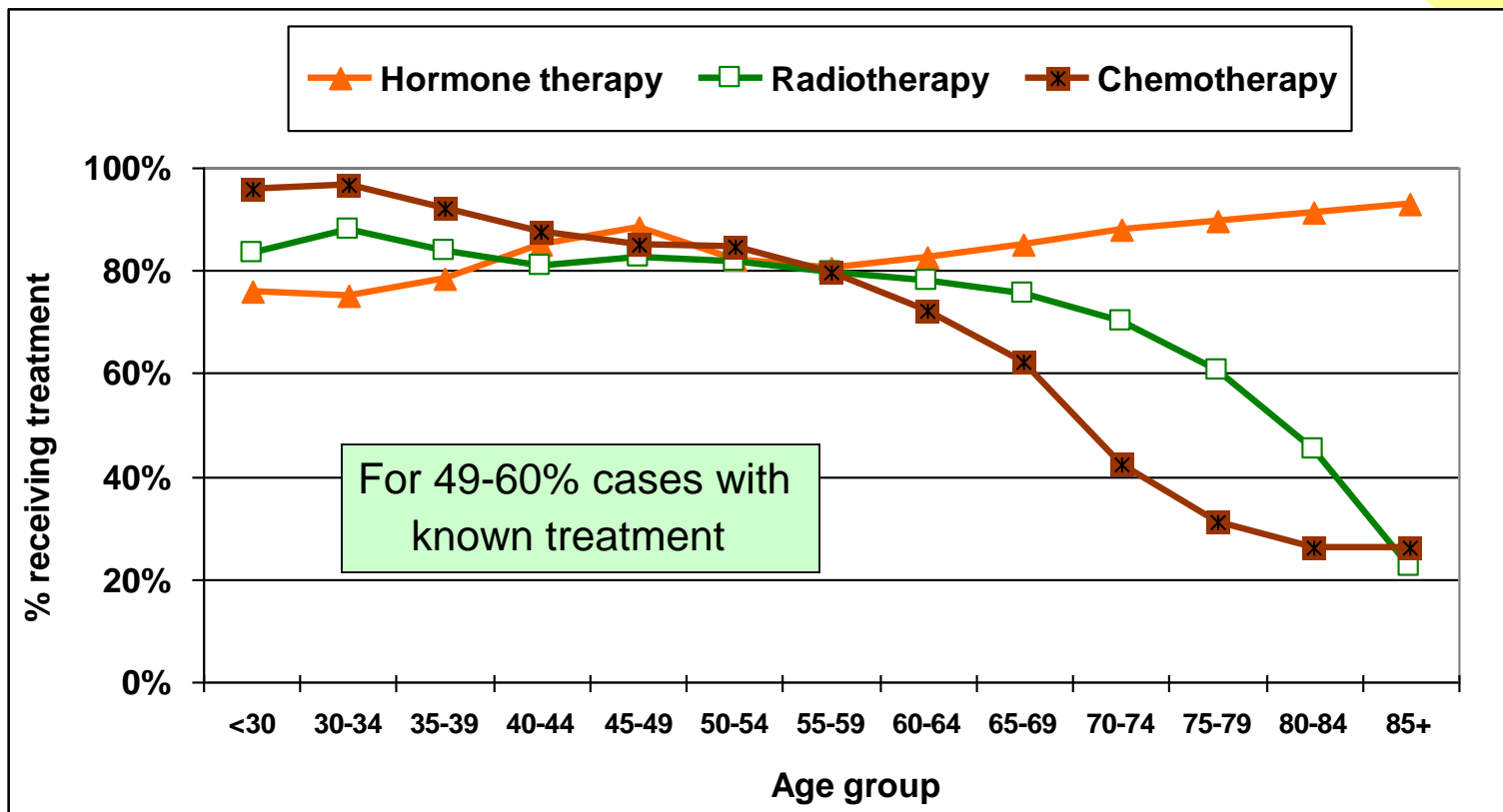
Patients in England diagnosed with breast cancer in 2006

# Sentinel Lymph Node Biopsy repeat operation rates



Screen-detected breast cancers diagnosed in 2008/09

# Adjuvant therapy variation with age

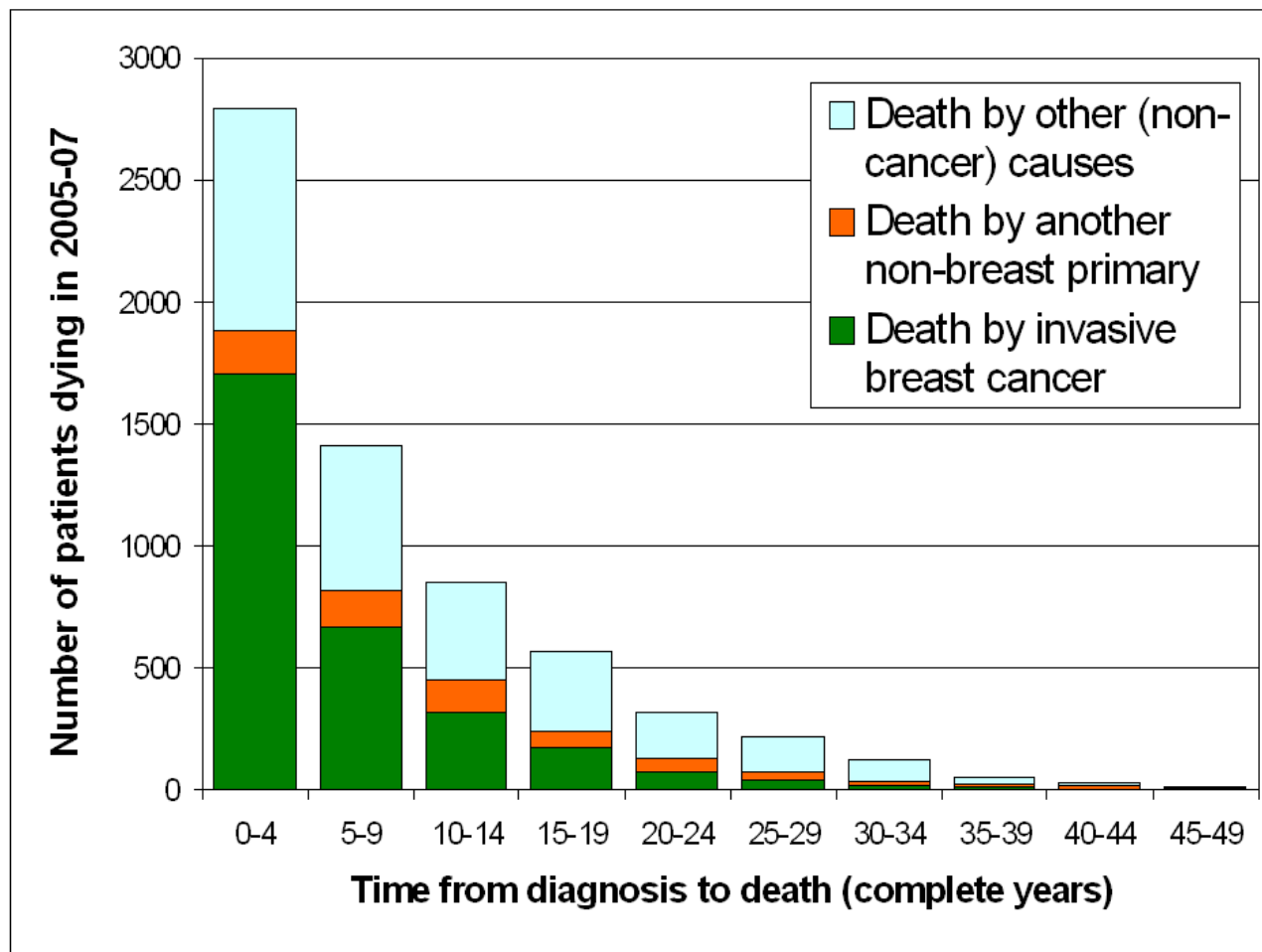


Fewer older patients receive radiotherapy. More younger patients receive chemotherapy. More older patients receive only hormone therapy

Cohort: BCCOM symptomatic diagnosed in 2006 (England)

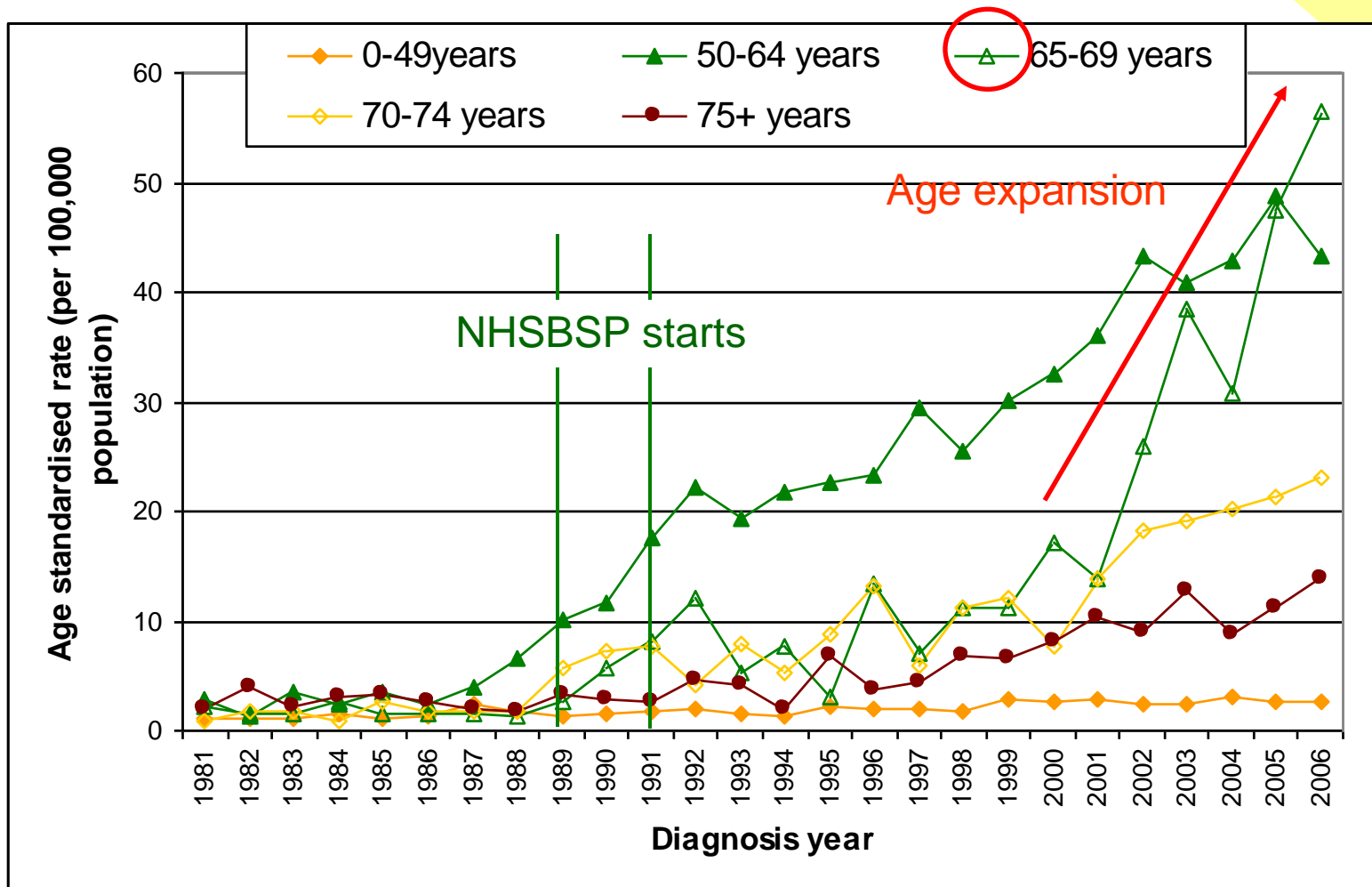


# Survivorship cause of death

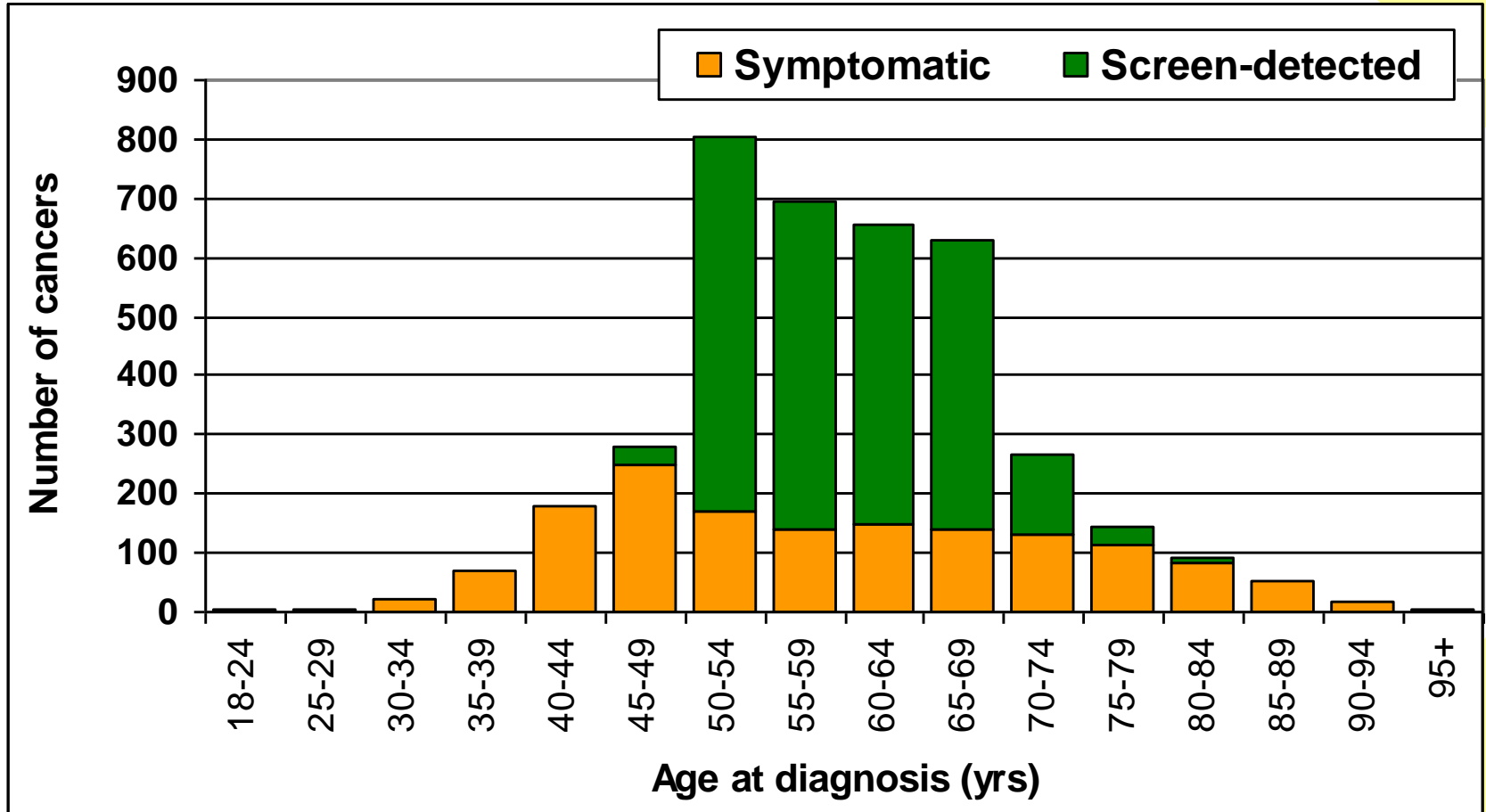


West Midlands Breast Cancer Patients Who Died in 2005-07

# In situ breast cancer West Midlands data



# Non-invasive breast cancer screening and symptomatic cases



Non-invasive breast cancers diagnosed in England in 2006



# Limitations of Data Currently Available

# Data collection by UK registries

## Survey results



Data item not collected by one or more registries	Cancer Registry											HES
	Eastern	North West	Northern & Yorkshire	Northern Ireland	Oxford	Scotland	South West	Thames	Trent	Wales	West Midlands	
<b>National Cancer Registration Dataset items</b>												
Invasive tumour size									2008	X		
Vascular/lymphatic invasion	X	2009				X		X	X			
Excision margins	X	2009				X		X	X	2009		
Nodes examined									X	X		
Nodes positive		2009							X	2008		
NPI score (invasive tumours)		X	2008				2006	X	X	2008		
Surgery		X							X			✓
Radiotherapy										2008		
Hormone therapy										X		
<b>Royal College of Pathologists Breast Cancer Dataset items</b>												
Cytonuclear grade		X		X		X			X	X		
Whole tumour size (invasive tumours)	X	X		X	X	X	X	X	X	2008		
Sentinel lymph node procedure	2009	X	X			X	2007	X	X	2007		✓
ER status	2010	X			X		X	X	X	X		
HER2 status	2010	X	X		X	X	X	X	X	X		
<b>Other data items in BCCOM dataset</b>												
Breast surgeon				2006		X						✓
VNPI score	X	X	X	X	X	X	X	X	X	X		
PR status	X	X			X	X	X	X	X	X		
Pre-operative diagnosis	X	X				X	X	X	X	2010		

**X** = data item not collected for 2006 cases, no firm plans to collect

**date** = start date for collection implemented or planned

**Green** = data item collected and provided for 2006 cases

# England or UK data?



Data item	England	Northern Ireland	Scotland	Wales
Morphology	✓	✓	✓	✓
Invasive size, invasive grade, nodal status and Nottingham Prognostic Index for invasive cancers	✓			
Receptor status	✓			
Surgery	✓	✓	✓	✓
Number of operations	✓			
Final therapeutic operation type	✓	✓	✓	✓
Sentinel lymph node biopsy	✓			
Immediate reconstruction	✓			
Radiotherapy	✓*	✓	✓	
Chemotherapy	✓*	✓	✓	
Survival	✓			

**All Breast Cancers Report 2006**  
**Cancer registry merged dataset + BCCOM dataset**  
**+ NHSBSP audit dataset + HES data**

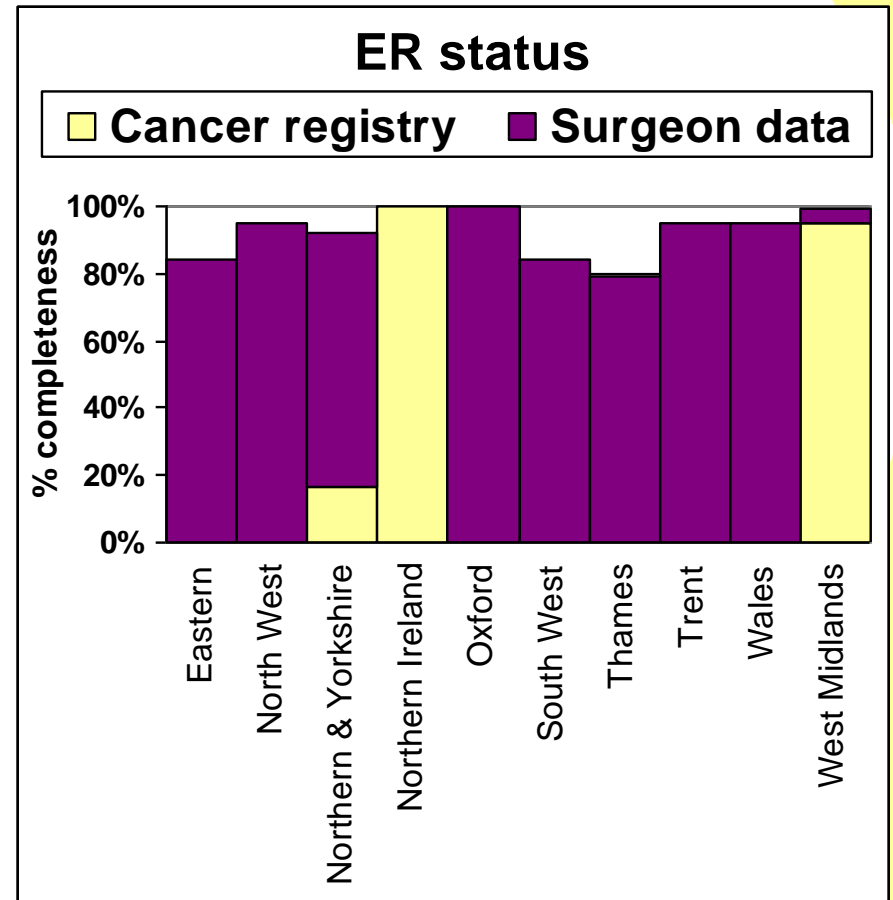
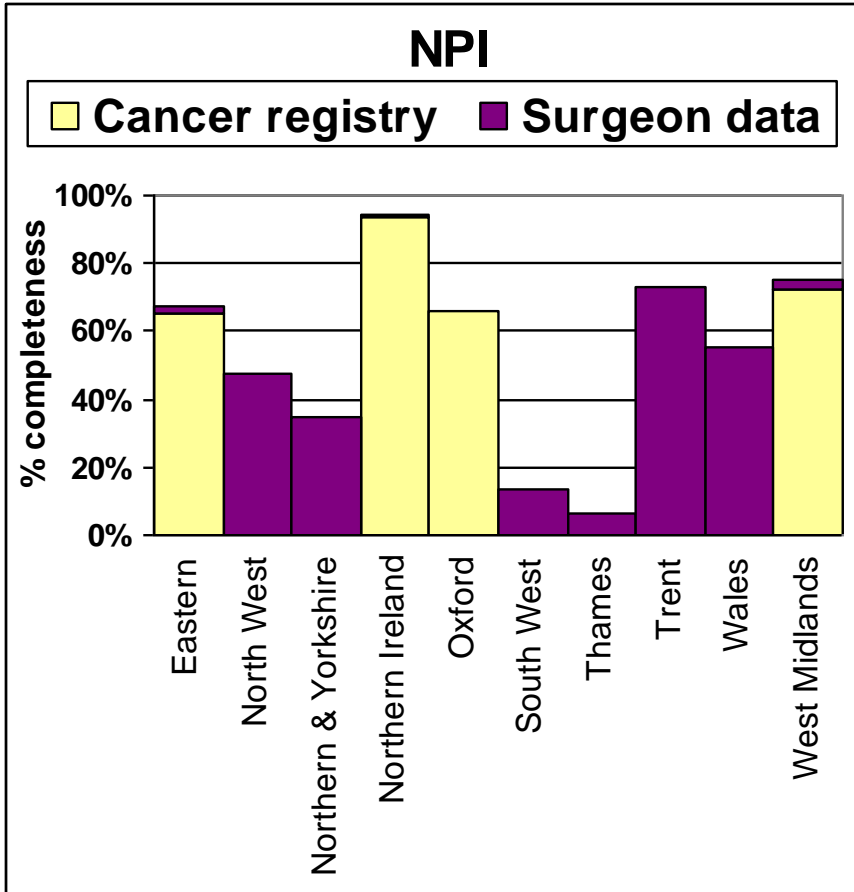
# Data completeness England



Data item	Number of cases	% England
Surgical treatment	33,717	81
Surgical treatment (invasive cancers)	29,663	72
Morphology	33,545	81
*Invasive tumour size	25,350	85
*Invasive tumour grade	28,462	96
*Nodal status (invasive cancers)	20,798	70
*NPI (invasive cancers)	19,832	67
*Oestrogen receptor status (invasive cancers)	14,330	48
*Progesterone receptor status (invasive cancers)	10,954	37
*HER2 status (invasive cancers)	10,487	35
*Number of operations	31,145	92
Final therapeutic operation	38,198	92
Sentinel lymph node biopsy	18,155	44
Immediate reconstruction	3,751	9
*Radiotherapy (invasive cancers)	19,217	65
*Chemotherapy (invasive cancers)	20,391	69
*Hormone therapy (invasive cancers)	17,103	58



# Comparison of BCCOM data and cancer registration data





# Conclusions



- HES data can be used to supplement and improve the data on surgical treatment and chemotherapy collected by cancer registries
- Surgeons have access to many of the data items currently not well recorded by some cancer registries
  - These registries should improve data completeness by liaising with surgeons to access their data sources
- Some registries currently have no plans to record
  - invasive tumour size, vascular invasion, excision margin status, NPI score, ER status and HER 2 status
- These data items are crucial for the evaluation of patient outcomes and adherence to clinical guidelines

**We can't wait until the new NCDS delivers these data items for cases diagnosed in 2014**

# Work programme - top 10



Work Area	Description
<b>All Breast Cancer Report (2007)</b>	Review of all UK cancers diagnosed in 2007 by route of presentation. Extend to include comparison between regions
<b>Breast cancer in the elderly</b>	Analysis of breast cancer treatment with increasing age (2006)
<b>International Benchmarking</b>	International study on treatment received for breast cancers (UK data)
<b>Non-invasive breast cancers</b>	Compare non-invasive breast cancers a) entered into the Sloane Project b) detected via screening and c) detected symptomatically
<b>HTA Screening Mammography Follow-up (WM)</b>	Project to test the efficacy of screening mammography follow up in detecting recurrences
<b>Breast Cancer Mortality (WM)</b>	Review of breast cancer patients who have died in a given time period
<b>Recurrences (non-invasive)</b>	Identify invasive recurrences in patients with non-invasive breast cancer
<b>Screening status</b>	Application of screen-detected flag to data held as far back as possible. Would enable an evaluation of difference by ethnic group on larger cohort of screen-detected cases
<b>Effect of deprivation and ethnicity</b>	Analysis of interplay of deprivation with ethnicity on breast cancer outcomes
<b>AdjuvantUK (ECRIC &amp; WM)</b>	Validation cohort for new treatment planning tool



# Thank you

Olive Kearins  
Catherine Lagord  
Jasmin Sidhu  
Shan Cheung  
Nicola Greenway  
Jackie Walton  
Alan Macdonald