ICBP SURVMARK-2

a comprehensive and innovative approach to international cancer survival benchmarking

Dr Freddie Bray

Head of Cancer Surveillance Section
International Agency for Research on Cancer (IARC)
The ICBP Partnership

- International cancer survival comparisons measuring differences and understanding factors that drive international variations in cancer survival.
- Multidisciplinary partnership of academics, clinicians, policymakers, cancer registry teams and data experts.
- Aimed at delivering high quality findings with rapid translation into practice.
- Funded by cancer charities, departments of health, cancer registries, universities in each jurisdiction. Programme Management provided by Cancer Research UK.
ICBP Phase-2 Benchmarking 8 cancer types in 21 jurisdictions in 7 countries

- Updated survival benchmarking using key metrics by sex, age and stage; including incidence and mortality trends
- Increased number of cancer types studied
- Increased number of ICBP partners
- A user-friendly and interactive online tool to enable visualization, further analysis and download of key results
- Early-career fellowships enabling researchers to exchange knowledge and expertise

• UK
  - England, Wales, Scotland and Northern Ireland
• Ireland
• Norway
• Denmark
• Australia
  - New South Wales, Victoria and Western Australia
• New Zealand
• Canada
  - Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island, Quebec and Saskatchewan
SURVMARK-2

Element A: To establish the most up to date international cancer survival benchmark (plus insights into the impact of stage at diagnosis and stage-specific survival)

Element B: Overview of international coding frameworks, including staging classifications – to confirm feasibility of collecting & comparing data.

Element C: Quantifying the impact of local registration practices on survival – to identify adjustment factors that should be applied to cancer survival comparisons.

ICBP Phase-2 Benchmarking 8 cancer types in 21 jurisdictions in 7 countries
ICBP Phase-2
Forthcoming studies

- Trends in survival for eight cancers: progress 1995-2014
- Report cards to jurisdictions
- 8 stage-specific manuscripts by cancer site
- International guidelines on best practice / Staging tool
  - Develop stage conversions and mappings
  - Summary report of coding and classification practices by jurisdiction
- Qualification and quantification of registry factors impacting on cancer survival

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**2.3.2 Relative Survival**

![Graphs showing relative survival measures for oesophageal cancer in Norway](image)

**Figure 2.2: Relative survival measures for oesophageal cancer in Norway**

**2.3.3 Cure**

![Graphs showing cure metrics for oesophageal cancer in Norway](image)

**Figure 2.3: Cure metrics for oesophageal cancer in Norway**

**2.3.4 Loss in Expectation & Crude Probabilities**

![Graphs showing loss metrics and crude probabilities](image)

**Figure 2.4: Life lost and crude probability metrics**
SURVMARK-2: First overview of survival, incidence and mortality

Aim: To describe current patterns and recent trends in survival 1995-2014 followed up until the end of 2015.

Quality control: Screen for specific anomalies (negative survival duration, out-of-range dates of diagnosis and/or dates of death, invalid vital status codes).

Methods: Net survival at 1 and 5 years after diagnosis computed by age (<75 vs 75+ years), sex, period and cancer site for each jurisdiction using Pohar Perme estimators. Absolute comparisons compared with incidence and mortality.
Trends in 5-yr net survival by country, 1995-1999 vs 2010-2014
Progress in cancer survival across six high-income countries

## Changes in 1-year net survival

<table>
<thead>
<tr>
<th></th>
<th>all ages</th>
<th>New</th>
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<th>Canada</th>
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<td>5.7</td>
<td>9.7</td>
<td>4.5</td>
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<tr>
<td>abs change*</td>
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<td>3.4</td>
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## Changes in 5-year net survival

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<td>Rectum</td>
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Changes in cancer survival, incidence and mortality, 1995-2014

Decreasing incidence, decreasing mortality, and improved survival
= Optimal progress
Changes in cancer survival, incidence and mortality, 1995-2014
Changes in lung cancer survival, incidence and mortality, 1995-2014

**MALES**
- Increases in survival in all countries
- Decreases in incidence and mortality (most countries)

**FEMALES**
- Increases in survival in all countries
- Increases in incidence (most countries)
Changes in colorectal cancer survival, incidence and mortality, 1995-2014

**Colon**

**Males**

- Increases in survival in all countries

- Decreases in incidence and mortality (most countries)

**Females**

- Increases in survival in all countries

- Decreases in incidence and mortality (some countries)

**Rectal**

**Males**

- Increases in survival in all countries

- Decreases in incidence and mortality (most countries)

**Females**

- Increases in survival in all countries

- Decreases in incidence and mortality (some countries)
ICBP Phase-2 – summary

• Consistently higher survival observed in Australia (followed by Norway and Canada); estimates lower for New Zealand, Ireland and the U.K.

• Cancer survival increased in all six countries over the past 20-year period (1995-2014).

• Significant progress in cancer control was observed in all countries for colon, lung (in males) and ovarian cancers.

• In-depth analyses underway to better understand these differences
ICBP collaborators

Tervonen (Cancer Institute NSW, Alexandria, New South Wales, Australia); Hazem Abd Elkeader (Cancer Society of New Zealand, Wellington, New Zealand); Heather Stuart-Pankov (Saskatchewan Cancer Agency, Regina, Saskatchewan, Canada); Helen Fanuzy (Cancer Council Victoria, Melbourne, Victoria, Australia); Janet Warlow (Welsh Cancer Intelligence & Surveillance Unit, Public Health Wales, Cardiff, Wales, United Kingdom); Jason Poole (Public Health England, London, England, United Kingdom); Jes Søgaard (The Danish Cancer Society (Køge), Copenhagen, Denmark); Tammie Bu (Alberta Health Services, Edmonton, Alberta, Canada); John Dowling (Department of Health, Perth, Western Australia, Australia); John Spinelli (The BC Cancer Research Centre, Vancouver, British Columbia, Canada); Maureen MacIntyre (Nova Scotia Health Authority, Halifax, Nova Scotia, Canada); Paul Walsh (National Cancer Registry Ireland, Cork, Ireland); Prithwish De (Cancer Care Ontario, Toronto, Ontario, Canada); Paul Walsh (National Cancer Registry Ireland, Cork, Ireland); Richard Trevithick (WA Cancer Registry, Department of Health, Perth, Australia); Richard Watson (Cancer Institute NSW, Alexandria, New South Wales, Australia); Rory Carie (Department of Health, Perth, Western Australia, Australia); Ryan Woods (The BC Cancer Research Centre, Vancouver, British Columbia, Canada); Sally Vemont (Public Health England, London, England, United Kingdom); Serena Koze (Saskatchewan Cancer Agency, Regina, Saskatchewan, Canada); Susan Ryan (Eastern Health, St. John’s, Newfoundland and Labrador, Canada); Suzanne Leonefleiner (Government of New Brunswick, Fredericton, New Brunswick, Canada); Vicky Thurfield (Cancer Council Victoria, Melbourne, Victoria, Australia).

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ICBP Programme Board:

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ICBP funders and partners

Aarhus University (Denmark)
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Cancer Control Alberta (Canada)
Cancer Council Victoria (Australia)
Cancer Institute New South Wales (Australia)
Cancer Research UK (UK)
Cancer Society of New Zealand (New Zealand)
CancerCare Manitoba (Canada)
Cardiff University (UK)
Danish Cancer Society (Denmark)
Danish Health Authority (Denmark)
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Department of Health and Human Services, Victoria (Australia)
Department of Health, Western Australia (Australia)
Grwp Cydysylitu Gwasanaethau Canser – Cancer Services Co-ordinating Group (UK)
Grwp Cynghori Arbenigol Cenedlaethol Canser – Cancer National Specialist Advisory Group (UK)
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Llywodraeth Cymru – Welsh Government (UK)
London School of Hygiene and Tropical Medicine (UK)
Macmillan Cancer Support (UK)
National Cancer Registry (Ireland)
NHS England (UK)
Northern Ireland Cancer Registry (UK)
Norway University of Science and Technology (Norway)
Norwegian Cancer Society (Norway)
Norwegian Directorate of Health (Norway)
Prifysgol Bangor – Bangor University (UK)
Public Health England (UK)
Queens University Belfast (UK)
Rhwydwaith Canser De Cymru – South Wales Cancer Network (UK)
Swedish Association of Local Authorities and Regions (Sweden)
Tеновус Cancer Care (UK)
The Eve Appeal (UK)
The Public Health Agency for Northern Ireland (UK)
The Royal Marsden NHS Foundation Trust (UK)
The Scottish Government (UK)
The Swedish Government (Sweden)
The University of Edinburgh (UK)
UCL Elizabeth Garrett Andersen – Institute for Women’s Health (UK)
United Kingdom Association of Cancer Registries (UK)
University College London (UK)
University of Oxford (UK)
Ymchwil Canser Cymru – Cancer Research Wales (UK)
Exploring differences in cancer survival around the world

Module 4 – routes to cancer diagnosis

David Weller, University of Edinburgh
Peter Vedsted, Aarhus University
Usha Menon, UCL London
International Cancer Benchmarking Partnership

- international cancer survival comparison study focussed on measuring differences and understanding factors that drive these

- multidisciplinary partnership of academics, clinicians, policymakers, cancer registry teams and data experts

- aimed at delivering high quality findings with rapid translation into practice

- funded by cancer charities, departments of health, cancer registries and/or universities in each jurisdiction
Cancer survival improved overall between 1995-2007 in all jurisdictions.

**Lung cancer**
5-year survival changes, 1995-1999 to 2005-2007

- Canada
- Australia
- Sweden
- Norway
- Denmark
- UK*

**Breast cancer**
5-year survival changes, 1995-1999 to 2005-2007

- Sweden
- Australia
- Canada
- Norway
- Denmark
- UK*

**Bowel cancer**
5-year survival changes, 1995-1999 to 2005-2007

- Australia
- Canada
- Sweden
- Norway
- Denmark
- UK*

**Ovarian cancer**
5-year survival changes, 1995-1999 to 2005-2007

- Canada
- Norway
- Australia
- UK*
- Denmark

reasonable evidence for breast, colorectal, head and neck, testicular and melanoma

less so for pancreatic, prostate and bladder cancers

insufficient evidence or equivocal findings in the other cancers.
An investigation of routes to cancer diagnosis in 10 international jurisdictions, as part of the International Cancer Benchmarking Partnership: survey development and implementation

David Weller,1 Peter Vedsted,2 Chantelle Anandan,1 Alina Zalounina,2 Evangelia Ourania Fourkala,3 Rakshit Desai,3 William Liston,3 Henry Jensen,2 Andriana Barisic,4 Anna Gavin,5 Eva Grunfeld,6 Mats Lambe,7 Rebecca-Jane Law,8 Martin Malmberg,9 Richard D Neal,8 Jatinderpal Kalsi,3 Donna Turner,10 Victoria White,11 Martine Bomb,12 Usha Menon,3 ICBP Module 4 Working Group*
Differences in time intervals from first symptom, through diagnosis and up to the start of treatment between jurisdictions could affect the outcomes of patients with suspected cancer.

The team developed validated patient, primary care practitioner and cancer treatment specialists questionnaires.

Questionnaires gathered information on key milestones within the patient journey from all 3 sources:
- Specific time intervals and details of a patient’s route to diagnosis and treatment.
- The number of times a patient saw a health care professional before diagnosis.
- The nature of any referrals and diagnostic tests carried out.

Data were supplemented with routinely recorded data (eg cancer registry data) and a data hierarchy produced.
### Route to diagnosis - Colorectal

<table>
<thead>
<tr>
<th></th>
<th>Victoria</th>
<th>England</th>
<th>Wales</th>
<th>Scotland</th>
<th>N Ireland</th>
<th>Manitoba</th>
<th>Ontario</th>
<th>Sweden</th>
<th>Denmark</th>
<th>Norway</th>
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<tbody>
<tr>
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<tr>
<td>Overall</td>
<td>76.1%</td>
<td>77.3%</td>
<td>73.5%</td>
<td>70.3%</td>
<td>84.6%</td>
<td>68.2%</td>
<td>79.8%</td>
<td>99.0%</td>
<td>98.1%</td>
<td>92.3%</td>
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<tr>
<td>GP route</td>
<td>73.2%</td>
<td>82.6%</td>
<td>77.4%</td>
<td>92.3%</td>
<td>83.2%</td>
<td>67.1%</td>
<td>62.3%</td>
<td>51.8%</td>
<td>82.3%</td>
<td>78.4%</td>
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<td>(% of symptomatic)</td>
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<tr>
<td>Straight to A&amp;E</td>
<td>8.2%</td>
<td>3.8%</td>
<td>7.2%</td>
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<td>6.5%</td>
<td>9.1%</td>
<td>8.2%</td>
<td>11.7%</td>
<td>3.2%</td>
<td>4.6%</td>
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<tr>
<td>(% of symptomatic)</td>
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<td></td>
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<tr>
<td>Other</td>
<td>18.2%</td>
<td>13.7%</td>
<td>15.4%</td>
<td>7.2%</td>
<td>10.3%</td>
<td>23.9%</td>
<td>29.6%</td>
<td>36.5%</td>
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<td>(% of symptomatic)</td>
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<td>Screening</td>
<td>21.5%</td>
<td>21.2%</td>
<td>25.8%</td>
<td>28.6%</td>
<td>13.8%</td>
<td>31.4%</td>
<td>17.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>6.3%</td>
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<td>(overall %)</td>
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ICBP International Cancer Benchmarking Partnership
**Colorectal intervals (days) – BMJ Open (in press)**

### Median

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<thead>
<tr>
<th>Country</th>
<th>Patient Interval</th>
<th>Diagnostic Interval</th>
<th>Treatment Interval</th>
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<td></td>
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<tr>
<td>Ontario</td>
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<td>Sweden</td>
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### 90th percentile

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<th>Treatment Interval</th>
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<tr>
<td>Scotland</td>
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<tr>
<td>England</td>
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<tr>
<td>Wales</td>
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### Table: Primary Care interval (Symptomatic patients)

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<th>Number</th>
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<th>England (n=152)</th>
<th>Scotland (n=160)</th>
<th>N Ireland (n=207)</th>
<th>Denmark (n=72)</th>
<th>Manitoba (n=124)</th>
<th>Norway (n=0)</th>
<th>Sweden (n=77)</th>
<th>Ontario (n=117)</th>
<th>Victoria (n=117)</th>
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<tbody>
<tr>
<td>Median</td>
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<td>3</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>n/a</td>
<td>1</td>
<td>9</td>
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<tr>
<td>75th centile</td>
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<td>28</td>
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<td>30</td>
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<td>90th centile</td>
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<td>93</td>
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<td>210</td>
<td>82</td>
<td>n/a</td>
<td>70</td>
<td>128</td>
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## Routes to diagnosis - lung

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<tr>
<th></th>
<th>51%</th>
<th>60%</th>
<th>52%</th>
<th>65%</th>
<th>66%</th>
<th>50%</th>
<th>32%</th>
<th>31%</th>
<th>60%</th>
<th>40%</th>
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<tbody>
<tr>
<td><strong>GP referral</strong></td>
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Methodological issues

• Selection bias? (minimised through using cancer registries)

• Use of questionnaires – cultural/social differences in interpretation of some questions

• Need for data rules: ‘hierarchy of responses’

• Differential response rates to questionnaires

• Low representation from minority ethnic groups

• Crude measure of morbidity

• While results adjusted for age, gender and co-morbidity, likely to be residual confounding

• Unable to adjust for ethnicity and education

• Understanding of the concept of ‘screening’ versus ‘symptomatic’ routes
ICBP Module 4: an exemplar of international collaboration

• We have uncovered intriguing differences in routes to diagnosis, and diagnostic & treatment intervals
• While they show little obvious correlation with survival, they do demonstrate differences of interest to individual jurisdictions
• We need better information on what is going on in the intervals – for example, are prolonged primary care intervals the result of GPs doing more before they refer?
• It was a huge effort, involving multiple centres, ethics processes, local barriers and glitches, cultural challenges and time differences
• There were many teleconferences at unsociable hours!
• It probably won’t be repeated, but we probably WILL find easier ways of collecting these kinds of data
Plasma Vitamin D Concentration Influences Survival Outcome After a Diagnosis of Colorectal Cancer

Lina Zgaga, Evropi Theodoratou, Susan M. Farrington, Farhat V.N. Din, Li Yin Ooi, Dominik Glodzik, Susan Johnston, Albert Tenesa, Harry Campbell, and Malcolm G. Dunlop
Maybe it’s about happiness..
Cancer treatment starts in India at least after 4 months' delay, finds study

Subodh Varma | TNN | Dec 7, 2016, 20:16 IST

NEW DELHI: A study carried out at the cancer department of a premier referral hospital in Chandigarh, India has shown that patients wait an average of four months before seeking a cancer diagnosis. Results of the study were reported at the European Society for Medical Oncology (ESMO) ASIA 2016 Congress in Singapore. "Delaving diagnosis had a
Factors Responsible for the Diagnostic Delay in Oral Cancer Patients: A Hospital Based Sociodemographic Study in Kolkata

Norsadalah et al. BMC Cancer 2011, 11:141
http://www.biomedcentral.com/1471-2407/11/141

Presentation delay in breast cancer patients and its association with sociodemographic factors in North Pakistan

Muhammad Aleem Khan1, Sheharyar Hanif1, Sundas Iqbal1, Muhammad Faheem Shahzad1, Schria Shafique1, Muhammad Taha Khan2

1Department of Nuclear Medicine, Nuclear Medicine, Oncology and Radiology Institute, Islamabad, Pakistan; 2Department of Medicine, Ziauddin Medical University, Kemari Campus, Karachi, Pakistan; 3Armed Forces Institute of Cardiology, Rawalpindi, Pakistan; 4Department of Pathology, Rawal Institute of Health Sciences, Islamabad, Pakistan; 5Nishtar Breast Hospital, Lahore, Pakistan. Correspondence to: Dr. Muhammad Aleem Khan, MBBS, M.Sc, MPSP, FCPG. House No. 335, Street No. 165, Sector-I-04, Islamabad, Pakistan. Email: drsaleemkhan@yahoo.com.

Identifying the Factors Causing Delayed Presentation of Cancer Patients to a Government Medical College of Central India

WEEK TINARI, VEERENDR YODG, HAMEED UZZAFAR GHOPI, OM PRakash SINGH, KARAN PREHRE, SURESH YADAV, CHANDIL MOREhare

Diagnosis delay of breast cancer and its associated factors in Malaysian women

Bachok Norsadalah1, Krishan G Rahman2, Mohd A Rahmah2, Nyla N Nair1 and Biswa M Biswal3

Iran Red Crescent Med J. 2014 December;16(12): e14490. Published online 2014 December 30.

Stage at Diagnosis and Delay in Seeking Medical Care Among Women With Breast Cancer, Delhi, India

Sadegheid Pakseresht1, Gopal Krishna Ingle2, Suneela Garg2, Nahid Sarsraz3

Challenges to the early diagnosis and treatment of breast cancer in developing countries

Karla Unger-Saldaña

Reasons for Patient’s Delay in Diagnosis of Breast Carcinoma in Pakistan

Zahid Ali Memon1, Anum Nizamuddin Shaikh2, Sundas Rizwan2, Maimoona Batoon Sardar2
Routes to diagnosis research in LMICs

- Later stage of diagnosis, poor survival rates
- Often quite different pattern than in developed countries: delays in telling family members, alternative practitioners, significant delays in accessing diagnosis and treatment
- Diagnostic (and treatment) intervals typically longer
- Different profile of barriers to seeking help and diagnosis: cultural, spiritual, financial factors more prominent
- Health literacy and cultural issues in obtaining RTD information
- Range of methods used; self-completion questionnaire approaches relatively uncommon
Benefits of RTD research partnerships between LMICs and developed countries

• Great capacity to learn from one another

• LMIC-LMIC comparisons

• Sharing of methodological approaches – development of culturally-appropriate instruments, re-thinking of time-points and intervals, instruments to capture tortuous patient journeys

• Ideally we should continue to work towards a global network of RTD researchers to promote early diagnosis in a wide range of settings
ICBP collaborators and funders

Aarhus University (Denmark)
Abertawe Bro Morgannwg University Health Board (Wales)
BC Cancer Agency (Canada)
Canadian Partnership Against Cancer – Partenariat Canadien Contre Le Cancer (Canada)
Cancer Care Ontario (Canada)
Cancer Control Alberta (Canada)
Cancer Council Victoria (Australia)
Cancer Institute New South Wales (Australia)
Cancer Research UK (UK)
Cancer Society of New Zealand (New Zealand)
CancerCare Manitoba (Canada)
Danish Cancer Society (Denmark)
Danish Health Authority (Denmark)
Department of Health (UK)
Department of Health and Human Services, Victoria (Australia)
Department of Health, Western Australia (Australia)
Grwp Cydgysylitu Gwasanaethau Canser – Cancer Services Co-ordinating Group (UK)
Grwp Cynghor Arbenigol Cenedlaethol Canser – Cancer National Specialist Advisory Group (UK)
Guidelines and Audit Implementation Network (GAIN) (UK)
International Agency for Research on Cancer (France)
Kings College London (UK)
Lechyd Cydoeddus Cymru – Public Health Wales (UK)
Llywodraeth Cymru – Welsh Government (UK)
London School of Hygiene and Tropical Medicine (UK)
Macmillan Cancer Support (UK)
National Cancer Registry Ireland (UK)
NHS England (UK)
Northern Ireland Cancer Registry (UK)
Norway University of Science and Technology (Norway)
Norwegian Cancer Society (Norway)
Norwegian Directorate of Health (Norway)
Prifysgol Bangor – Bangor University (UK)
Public Health England (UK)
Queens University Belfast (UK)
Rhwydwaith Canser De Cymru – South Wales Cancer Network (UK)
Swedish Association of Local Authorities and Regions (Sweden)
Tenesus Cancer Care (UK)
The Eve Appeal (UK)
The Public Health Agency for Northern Ireland (UK)
The Royal Marsden NHS Foundation Trust (UK)
The Scottish Government (UK)
The Swedish Government (Sweden)
The University of Edinburgh (UK)
UCL Elizabeth Garrett Andersen – Institute for Women’s Health (UK)
United Kingdom Association of Cancer Registries (UK)
University College London (UK)
University of Oxford (UK)
Ymchwil Canser Cymru – Cancer Research Wales (UK)
Exploring differences in cancer survival around the world

Module 4 – routes to cancer diagnosis

Thanks for your attention!