Cancer survival: From global to local

Bernard Rachet

Cancer Survival Group
Department of Non-Communicable Disease Epidemiology
London School of Hygiene and Tropical Medicine

Research on cancer epidemiology, San Juan, Puerto Rico
21 February 2013
Global surveillance of cancer

- Mortality
  - Cancer Mortality Database (WHO), since 1950
- Incidence
  - Cancer Incidence in Five Continents (IARC), since 1966
- More recently, survival
Global surveillance of cancer – survival

- **EUROCare-1** (1995) – **EUROCare-5** (2013)
- **SEER Programme**
- **CONCORD-1** (2008)

- **Comparability**: central data management and analysis based on a unique protocol, using identical standards

Impact on two levels:
- Cancer survival, management and control
- Quality of population-based cancer registry data
EUROCARE studies

- Incidence from 1978 (EUROCARE-1) to 2007 (EUROCARE-5)

- **EUROCARE-1**
  - 30 cancer registries in 11 countries

- **EUROCARE-4**
  - 93 cancer registries in 23 countries
  - Coverage about 35% of the participating country population
Lessons from EUROCARE studies

- Wide disparities in cancer survival between European countries, but also great variability in:
  - Patterns of cancer survival (e.g. time trends, by age ...)
  - Cancer management (EUROCARE High-Resolution studies), including
    - Diagnostic investigations
    - Treatment – adherence to international guidelines

National and regional initiatives in most European countries, even those with good outcomes
Lessons from EUROCARE studies

Why Britain is lagging behind in cancer care

Our cure rates for common cancers are among the worst in Europe and each year 25,000 people may be dying as a result. Could a national cancer centre prove to be the remedy? Luisa Dillner reports

A culture that kills

Britain trails the rest of Europe in rates of survival once cancer has been diagnosed. Hilary Bower and Sarah Boseley ask why

It started as a small news item based on a flawed Swedish study that said breast screening didn't save lives. It was written for doctors in the British Medical Journal, with much criticism of the study's findings. By the end of the week it was on the front page of the Daily Mail ('Breast Screening Doesn't Prevent Deaths') and hotly debated on Newsnight.

At the National Breast Screening Programme they are now fielding calls from women who want to cancel their mammography appointments. 'What's the point?' they ask. 'It doesn't seem worth the bother.'

The hopelessness was reinforced by news last week that Britain's survival rates for common cancers, including breast, are lower than those for most of Europe. According to Karol Sikora, head of the World Health Organisation's Cancer Programme, data from the Eurocare 11 Study show Britain could save 25,000 lives a year if it was as good at treating cancers as the best countries.
Health minister responds to EUROCARE

“The NHS Cancer Plan … will speed up access to high quality services across the country to bring cancer services in line with the rest of Europe”

Yvette Cooper MP, Hansard, 23 Jan 2002
Lessons from EUROCARE studies
2000 NHS Cancer Plan in England

• A comprehensive ten-year strategy:
  – to improve prevention, early diagnosis and screening
  – to provide optimal treatment for all patients
  – to improve survival and quality of life
• 35% rise in annual funding for cancer services (2001-04)
• Multi-disciplinary teams (MDTs) of specialists
• Cancer-specific guidelines

• 2007: NHS Cancer Reform Strategy
• 2008: National Awareness and Early Diagnosis Initiative
• 2011: Improving Outcomes – A Strategy for Cancer
Lessons from EUROCARE studies
National Cancer Plans

• 2013 – Integrated national cancer plans *operating* or *in preparation* in most European countries
  – In order to address the still wide inequalities in cancer control both between and within these countries

• See [http://www.epaac.eu/national-cancer-plans](http://www.epaac.eu/national-cancer-plans)
Impact of EUROCARE on the Italian public health policy

The Sicilian regional health plan for oncology “Piano Sanitario Regione Sicilia 2002-2004” recognised the importance of the data from the Ragusa cancer registry and the need of other radiotherapy units in Sicily.

Lower survival in southern Italy

Scarce early diagnosis

Lack of radiotherapy units
EUROCARE studies
Additional remarks

• Capacity building
  – Population-based cancer registry data suitable for survival analysis
  – Critical research mass to manage, analyse and interpret such data

• Still lack of more detailed clinical data (tumour stage)
  – Initial long-term objective – stage-specific survival
Cancer survival in five continents (first CONCORD study)

- 101 population-based cancer registries in 31 countries
- About 300 million population base
- 1.9 million cancer patients (aged 15-99)
- Breast (F), colon, rectum, prostate
- Diagnosed 1990-94, followed up to 1999

*Lancet Oncology* 2008; 9: 730-756
Five-year relative survival (%) 
Breast cancer, women 
(15-99 years)
CONCORD-1 – example of Algeria

• Very poor survival
  – Despite legitimate concerns, general agreement among Algerian epidemiologists about results reflecting:
    – Poor access to health care (diagnosis and treatment)
    – Low health expenses

• However, regional political embarrassment
  – Audit on cancer registration, incidence and survival in Maghreb and Mashreq countries
  – 4 out of 8 Algerian cancer registries in CONCORD-2
  – Tunisia, Libya, Jordan
Five-year relative survival (%), breast (F)
USA, 1990-99, by race and program area

Precision of the survival estimate

- Black NPCR
- Black SEER
- White NPCR
- White SEER
CONCORD High-Resolution (HR) studies

• Low resolution study
  – Higher survival in the US than in Europe
  – Stage at diagnosis?

• High-resolution studies
  – To investigate origins of these differences
  – Random samples of breast, colorectal, prostate
  – Collection of detailed information on stage, diagnostic procedures, treatment and follow-up
Breast cancer survival in the US and Europe: a CONCORD high-resolution study

• Diagnosis period 1996-98, 5-year follow-up
• 7 US states, 12 European countries

• Aims
  – To compare stage distributions in the US and Europe
  – To estimate role of stage in survival differences
  – To compare adherence to “standard care” for breast cancer in relation to:
    – Age
    – Stage
    – Hormone receptor status
## Stage at diagnosis, by jurisdiction

<table>
<thead>
<tr>
<th>Region</th>
<th>T1N0</th>
<th>T2-3</th>
<th>T1-3</th>
<th>T4</th>
<th>M1</th>
<th>N/K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>15,842</td>
<td>32</td>
<td>14</td>
<td>33</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Northern Europe</td>
<td>2,010</td>
<td>34</td>
<td>11</td>
<td>29</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Western Europe</td>
<td>4,922</td>
<td>37</td>
<td>16</td>
<td>30</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>6,621</td>
<td>30</td>
<td>14</td>
<td>33</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>2,289</td>
<td>21</td>
<td>14</td>
<td>39</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>USA</td>
<td>3,120</td>
<td>39</td>
<td>14</td>
<td>26</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Breast cancer: 5-year age-standardised net survival (%) in Europe and the US in the late 1990s: country and region

 Allemani et al. Int J Cancer 2013
Breast cancer 5-year age-standardised net survival in Europe and the US in the late 1990s: region and stage at diagnosis
Breast cancer mean excess hazard of death per 1,000 person-years at selected time points since diagnosis, by region and age*

All ages (15-99 years)

70-99 years
Breast cancer mean excess hazard of death per 1,000 person-years at selected points since diagnosis, by region and stage.
Breast-conserving surgery plus radiotherapy (%): Europe and the US, women operated 1996-98
Small, node-negative tumours (T1N0M0)
Percentage of T1N0M0 cases receiving BCS+RT by TNEH

High TNEH countries: Denmark, France, Iceland
Medium TNEH countries: Finland, Italy, The Netherlands, Slovenia, Spain, Sweden
Low TNEH countries: Estonia, Poland, Slovakia

Allemani et al., EJC 2010
• Differences in breast cancer survival between Europe and the US in the late 1990s mainly explained by lower survival in Eastern Europe
• Low healthcare expenditure may have constrained the quality of treatment in Eastern Europe
• Need for population-based data on stage and treatment recognised by clinicians and epidemiologists
• High-resolution studies, a highly valid design to collect this information and address such research questions
• Funding to help cancer registries
International Cancer Benchmarking Partnership

- Australia, Canada, Denmark, England, Northern Ireland, Norway, Sweden, Wales
- 123 million population base (81%)
- Colorectum, lung, breast (F), ovary
- Diagnosed 1995-2007, followed up to end of 2007

- Phase 1 – Coleman et al. *Lancet* 2011
  - Lower survival in Denmark and the UK
- Phase 2 – Stage-specific survival analyses
- Phase 3 – Analysis of treatments
International Cancer Benchmarking Partnership

- Phase 2 – stage-specific survival analyses
- Walters et al. *Int J Cancer* 2013
  - Comparability of stage data from routine population-based registry

- Maringe et al. *Int J Cancer* 2013 (Ovary)
- Walters et al. *Thorax* 2013 (Lung)
- Walters et al. *Br J Cancer* 2013 (Breast)
- Maringe et al. *Acta Oncol* 2013 (Colorectum)
  - Adverse distribution of tumour stages
  - Low stage-specific survival
British standard of care thought to be a problem
Women wrongly blamed for going to doctor late

Sarah Boseley
Health editor

Women who are diagnosed with advanced ovarian cancer are less likely to survive in the UK than in similar countries around the world, according to government-funded research which also suggests that their treatment may not always be as good as in other countries.

The results of the study were described as "disturbing" by Cancer Research UK, whose experts analysed the data. They show clearly that the poor survival rates are not due to women delaying going to their GPs, as has often been suggested. That happens just as much in some other countries such as Denmark, where survival is better than in the UK.

Instead, it looks likely that the issue is with the care some women receive - and more likely about the standard of surgery than about drugs.

The International Cancer Benchmarking partnership was set up with funding from the Department of Health to compare cancer outcomes in a group of affluent countries.

The UK’s record on ovarian cancer was compared with that of Australia, Canada, Denmark and Norway. Overall in the UK, 69% of women survived for more than a year after diagnosis, compared with 72% in Denmark and 74-75% in the other three countries.

But survival in the UK was lower for those women diagnosed with advanced patients being diagnosed at each stage of the disease, suggesting that not going to the doctor until the disease is advanced and harder to treat is not the reason why women are less likely to survive here.

Annwen Jones, chief executive of Target Ovarian Cancer, said: “It is unacceptable that women with ovarian cancer in the UK face a lower survival rate than those in other countries.”

Professor John Butler from the Royal Marsden Hospital, one of the authors of the study and a Cancer Research UK clinical adviser for the project, said there were probably three major factors in the low UK survival rates.

"Patients in the UK may be less fit, with more obesity and more co-morbidities (other illnesses),” he said. "They may not be referred to one of the best places for treatment in the first place, and may be being diagnosed later in the disease progression."

Access to drugs for ovarian cancer is probably not the issue, he said, because they are "pretty universally available". But the most important treatment for ovarian cancer is radical surgery. It is likely that availability and quality of that is less good in other countries," he said.

Women need to be referred to a dedicated cancer centre by their doctors so that they get their operation from a surgeon who is a gynaecological oncologist, which means he is expert in removing ovarian tumours. However if they need urgent surgery, for instance because their cancer is causing a bowel obstruction, it may be necessary to have their operation elsewhere.

A Department of Health spokeswoman said: “We are working to bring England’s survival rates for all cancers up to the level of the best – by investing in earlier diagnosis and ensuring people get the best possible treatment.

“The National Institute for Health and Clinical Excellence has recently published clinical guidance and quality standards for ovarian cancer, to help professionals recognise the condition and make it clear what good care looks like. We would expect clinicians to put this guidance into practice and make sure all patients are offered the treatment that will work best for them.”
International Cancer Benchmarking Partnership

• High visibility

• International staging system
  – Conflict between clinical and epidemiological interests

• Data quality
  – Major overall efforts to make data comparable
  – Tumour stage and treatment: improve quality and completeness

• Updated priorities for England Department of Health?
  – More on high-quality cancer management (diagnosis and treatment)
  – Less on patients (higher cancer awareness and earlier consultation)
CONCORD-2
for a worldwide surveillance of cancer survival trends

• 250 population-based cancer registries in 65 countries

• Individual tumour records for patients (15-99 years) diagnosed during 1995-2009, followed up to 2009

• Malignancies: stomach, colon, rectum, liver, lung, breast (F), cervix, ovary, prostate, leukaemia and childhood acute lymphocytic leukaemia
CONCORD-2 – geographic coverage
## CONCORD-2 – geographic coverage

<table>
<thead>
<tr>
<th></th>
<th>REGISTRIES</th>
<th>COUNTRIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CONCORD-1</td>
<td>Extra</td>
</tr>
<tr>
<td>Africa</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Asia</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>C&amp;S America</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>N America</td>
<td>27</td>
<td>30</td>
</tr>
<tr>
<td>Europe</td>
<td>60</td>
<td>51</td>
</tr>
<tr>
<td>Oceania</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>102</td>
<td>148</td>
</tr>
</tbody>
</table>
What about Central America and Caribbean region?

- Population-based cancer registries

<table>
<thead>
<tr>
<th>Country</th>
<th>CI-5</th>
<th>CONCORDERD-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbados</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td><strong>Cuba</strong></td>
<td>Y/N</td>
<td>Y</td>
</tr>
<tr>
<td>Martinique</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Panama</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td><strong>Puerto Rico</strong></td>
<td>Y/N</td>
<td>Y</td>
</tr>
</tbody>
</table>

- Mexico (with Greece): only OECD countries without population-based cancer registry
Questions for cancer policymakers

• Is our population receiving optimal care, up to international standards?

• Disadvantaged groups: age, sex, region, SES, ethnicity?

• Is the service adequately monitored:
  – to evaluate performance against objectives
  – to identify under-performing hospitals or doctors?

• If objectives are met, do outcomes improve?
Conclusions

• High visibility
• Awareness on (international) inequalities in cancer survival
• Data from population-based cancer registries
  – High quality
  – Financial investment
  – Political support
• Building local capacity for cancer survival surveillance
  – Training and timeliness
• Monitoring progress in cancer control
  – Survival included in comprehensive cancer control plans
  – Help to define and evaluate strategies and plans