Pancreatic Cancer – a medical and public health emergency

Date of preparation: November 2014
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CHAPTER 1

Medical progress and scientific research have improved cancer outcomes in the last 20 years
Cancer is one of the leading causes of mortality worldwide and is responsible for approximately a quarter of all mortality in the western world

<table>
<thead>
<tr>
<th>Cancer</th>
<th>All deaths</th>
<th>Cancer deaths</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 28</td>
<td>4841</td>
<td>1267</td>
<td>26.1%</td>
</tr>
<tr>
<td>US</td>
<td>2468</td>
<td>575</td>
<td>23.3%</td>
</tr>
<tr>
<td>Canada</td>
<td>225</td>
<td>67</td>
<td>29.8%</td>
</tr>
<tr>
<td>Total</td>
<td>7534</td>
<td>1909</td>
<td>25.3%</td>
</tr>
</tbody>
</table>

Cancer accounts for 8.2 million deaths worldwide

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Great progress has been made over the last 20 years in improving outcomes across all major cancers.

Change in all cancer mortality rates, 1990–2011 (or nearest year)

Between 2003 and 2012 overall cancer mortality has decreased by approximately **1% per year** in both developed and less-developed regions and in both genders.

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Reasons for improved cancer outcomes include better diagnosis and more effective therapies

1. Earlier diagnostics have revolutionised outcomes of certain cancers
   
   Screening biennially for breast cancer from age 50 to 69 years achieved a median 16.5% reduction in deaths vs no screening

   For some types of lung cancer, if caught at the earliest stage, more than 70% of people survive their disease for at least 5 years

2. New therapies contribute greatly to increased life expectancy

   1960 – 1997
   New therapies account for 45% of the increase in life expectancy

   2000 – 2009
   New therapies account for 73% of the increase in life expectancy

3. Patient care management
   
   • Patient registries have supported researchers efforts to better understand cancers (e.g. Breast and Colon Cancer Family registries established by NCI in the US)

   • Shared experiences resulting from this available data has helped to improve patient care management

4. Genomic profiling of cancers has helped to develop targeted therapies

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Gene/mutation</th>
<th>Proportion of patients affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal</td>
<td>KRAS</td>
<td>30%-40%</td>
</tr>
<tr>
<td>Breast</td>
<td>HER2</td>
<td>25-30%</td>
</tr>
<tr>
<td>CML</td>
<td>BCR-ABL</td>
<td>95%</td>
</tr>
</tbody>
</table>

Note: CML: chronic myeloid leukaemia

Further work and investment in medical research is still required to diminish the burden of cancer and improve patient survival

**Cancer’s Challenge for Europe**

“Cancer is everybody’s business. In 2012 alone, 3.2 million people in Europe were diagnosed for the first time with cancer, about 13 million people were affected and 1.2 million died from this disease. For this reason, cancer research and innovation are a priority for the European Union.”

—Máire Geoghegan-Quinn, EU Commissioner for Research and Innovation

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An exception: Pancreatic Cancer has seen little progress in the last 20 years
Pancreatic cancer is the only cancer where mortality rates are increasing for both sexes

Pancreatic cancer is currently the 4th biggest cause of mortality in cancer in Europe

European mortality rates of pancreatic cancer compared with other diseases


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If outcomes do not improve, pancreatic cancer will be responsible for more deaths than breast cancer by 2020.

US mortality rates of pancreatic cancer compared with other diseases

Survival rates in Pancreatic Cancer have not changed meaningfully during the last 40 years

While most major cancers have seen improvements in survival on the back of improvements in treatment, outcomes in pancreatic cancer have remained consistently bad over 40 years

Survival rates in the UK

Pancreatic cancer is a poorly understood disease that is often difficult to treat

| Symptoms are non-specific and can be mistaken for other conditions |
| No identified biomarkers, genes or novel imaging modalities |
| Location of the tumor is difficult, hidden behind other organs |
| Metastases are so small they are difficult to detect with current technologies |
| Rapid evolution to the metastatic stage; most people diagnosed late-stage |

| High frequency of profound oncogenic mutations |
| Rare alterations found in unique combinations in each patients |
| Resistance to therapies: ability to adapt to stressful environment (chemotherapy and radiation) |

14. Oberstein 2013. Therapeutic advances in gastroenterology. Pancreatic cancer: why is it so hard to treat
As a result, Pancreatic Cancer has not benefited from either improved diagnosis or improved treatment for a long time

Pancreatic cancer has seen little progress in diagnosis

- Based on a recent literature review of observational studies, disease stage at diagnosis is advanced: studies reported >40% of patients with metastatic disease\(^\text{15}\)

Pancreatic cancer treatments are limited in number

- Until recently, first line medication for pancreatic cancer hadn’t changed since 1997
- Over 30 phase III clinical trials have failed\(^\text{16,30}\)
- Only 3 products have received EU regulatory approval since 1990\(^\text{31}\)

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\(^{16}\) http://clinicaltrials.gov/ct2/results?term=metastatic+pancreatic+cancer&phase=2&pg=1


CHAPTER 3

Pancreatic Cancer remains one of the deadliest cancers
Pancreatic cancer patients have very low survival chances compared to other cancer patients

*Mainly metastatic pancreatic patients

Average survival of pancreatic cancer patients is less than 6 months from diagnosis

- The two largest studies of a literature review of observational studies in pancreatic cancer patients both reported a median survival of 3 months\(^\text{15}\)
- Metastatic disease is almost always associated with abrupt and fatal outcomes with an even lower survival (<3 months)\(^\text{21}\)

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The vast majority of people will die within 5 years of diagnosis

Based on a recent EU literature review of observational studies, 1-year survival rates of pancreatic cancer patients ranged between 10% and 23%, with the largest study reporting a survival rate of 16%\(^\text{15}\).

Overall 5-year survival rates ranged from 0.5% to 9%\(^1\) based on an EU literature review of real-world evidence with the two largest studies reporting 5% and 3%\(^\text{15}\).

5-year survival for pancreatic cancer is dismal and one of the lowest of all cancers.

Patients lose 98% of their healthy life expectancy at the point of diagnosis.

Average at diagnosis of Pancreatic Cancer = 71 years

Healthy individual at age 71

Life expectancy at diagnosis for person with pancreatic cancer

Normal life expectancy = 15.1 years

Life years lost = 14.72

Pancreatic cancer patients lose almost 15 years of life in comparison to the general population when diagnosed with the disease, which on average occurs at the age of 71.\textsuperscript{15}

Pancreatic Cancer must be considered a major public health challenge
More than 100,000 people in Europe live with a diagnosis of pancreatic cancer.

103,845 patients affected by pancreatic cancer in Europe\(^\text{23}\)

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However, incidence rates for pancreatic cancer are increasing due to an ageing population

- In the UK, the incidence rates for females have increased by 11%, while rates for males have increased by 4% over the last decade\(^2^4\)
- In the US, pancreatic cancer incidence is projected to increase by 55% from 2010 to 2030\(^2^5\)
- Incidence rates are increasing as a result of demographic changes, mainly the growing number of older adults and minorities in the population\(^2^5\)


\(^2^5\). Pancreatic Cancer action network. 2012. The alarming rise of pancreatic cancer deaths in the United States: Why we need to stem the tide today.
Incidence is almost equal to mortality in pancreatic cancer

The annual incidence and mortality of pancreatic cancer are the same, meaning that most people will die from the disease within one year.

Age-standardised incidence and mortality rates

Incidence-mortality

EU

US

ASR (W) rate per 100,000

0 2 4 6 8 10

Incidence
Mortality

Note: ASR: Age-standardised rate (weighted)
Mortality rates of pancreatic cancer have increased in the last 40 years.

The number of people dying each year from pancreatic cancer has risen continuously over the last 40 years, as the incidence of the disease increases and survival times fail to improve.\(^\text{12}\)

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CHAPTER 5

Pancreatic Cancer needs to be made a public health priority
Successfully treated cancers such as breast cancer, started with incremental improvements in survival

The uptake of mammographic screening, coupled with improvements in therapy, has resulted in decreasing mortality rates at a time when the morbidity of treatment is also decreasing.

Unlike other cancers, pancreatic cancer outcomes have not significantly benefited from cancer research investments.

Investments in cancer research in the UK doubled within a decade, however unlike other cancers, pancreatic cancer outcomes have not yet benefited from these investments.

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Pancreatic cancer research needs to focus on multiple aspects to improve the disease outcome

- Identify earlier and faster detection tools
- Training and education of primary care physicians to improve familiarity with early symptoms
- Reduce the time from diagnosis to treatment

- Better understanding of basic biology and aetiology of pancreatic cancer
- Develop scientific model systems

EU AND NATIONAL RESEARCH PROGRAMMES

- Improved diagnostics
- Greater R&D support activities
- Better understanding of genomics
- Better patient management
- New clinical treatment

- Establishment and maintenance of patients registries
- Improved data collection processes
- Identify potential biomarkers
- Understand resistance to some chemotherapies
- Need for more clinical development programs for new drugs
- Improving the standard of care from purely palliation to active treatment

A recent global survey showed that pancreatic cancer is virtually unknown by many in Europe.

60% of all respondents to a recent survey conducted in the UK, France, Germany, Italy, Spain & the U.S. know almost nothing about pancreatic cancer.

Of survey respondents, 60% indicated they would be extremely/very supportive of a public awareness campaign supporting more public education once made aware of the poor survival associated with pancreatic cancer.

Of respondents overall, 70% rank supporting ways to increase screening and earlier diagnosis of pancreatic cancer as the most important goal in terms of raising awareness about pancreatic cancer.

61%
To address the high disease burden, pancreatic cancer should be a research priority involving multiple stakeholders.

**Pancreatic Cancer research needs to be a multi-stakeholder effort**

- Patient representatives
- Clinicians
- Industry
- Academia
- Policy makers

*INCREASING PUBLIC AWARENESS IS ESSENTIAL*
Pancreatic Cancer patients need to have the same opportunities as other cancer patients

“I dream that the word ‘cure’ will no longer be followed by the words ‘it’s impossible’”

—Patrick Swayze, died from pancreatic cancer

“The most important thing is to never lose hope, to never get depressed [....] I am afraid of leaving my children and husband alone”

—Anonymous pancreatic cancer patient
A call to actions

**IMPROVE SURVIVAL**

**EQUITY OF OUTCOME AND OPPORTUNITY**

**DATA COLLECTION AND REGISTRIES**

**BETTER UNDERSTANDING OF GENOMICS**

**EARLIER DIAGNOSIS**

**AWARENESS**

**“FIGHT” THE MORTALITY CURVE**

**NEW CLINICAL TREATMENT**
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10. [http://www.mycancergenome.org/content/disease/chronic-myeloid-leukemia/bcr-abl1](http://www.mycancergenome.org/content/disease/chronic-myeloid-leukemia/bcr-abl1) [accessed September 2014]
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