



# **Men and Cancer: Saving Lives**

Proceedings of the Expert Roundtable held at  
the King's Fund in London on January 29th 2013



David Wilkins

Thank you to our sponsors:



## About this document

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There is no "Executive Summary" for this document because the document is itself a summary of the presentations and the debate at the Men and Cancer Expert Roundtable. It is possible to read each of the five summary presentations and the "Background" section as a stand-alone papers, covering:

- The recent history of work to reduce the excess cancer mortality in men in the UK (*Background to the Roundtable*)
- Statistical trends as a guide to future action (Prof Alan White)
- Recent progress in Ireland, where an important national report has tried to identify some of the explanations for higher rates of cancer in men (Dr Noel Richardson and Nick Clark)
- Encouraging early presentation and early diagnosis in men (Kathy Elliott)
- Potential biological explanations for gender differences in cancer incidence and mortality (Prof David Phillips)
- Infections as a cause of cancer in men (Peter Greenhouse)

The Roundtable brought together some of the foremost thinkers on the relationship between gender and cancer. It also included national experts on improving male health. At fewer than fifty participants, the event was small enough that everyone was able to take part in the open discussion that followed the

presentations. The open discussion sought to answer three questions as a means of arriving at recommendations for future actions:

- What don't we know that we need to know?
- What ideas do we need to test or pilot?
- What should be our policy priorities?

Summaries of the Roundtable's answers to these questions can be found in the final chapter of the report. That chapter is essentially a series of recommendations for future priorities. The Men's Health Forum will use these recommendations as a basis for its own work on cancer over the next few years. Other organisations are of course, welcome to use the recommendations as a guide for their own actions to prevent cancer deaths in men. The Men's Health Forum would welcome hearing from any organisation that decides to act on any of these recommendations.

At Appendix 4 to this document is *The Excess Burden of Cancer in Men* in the UK, the comprehensive statistical digest produced by Cancer Research UK and the National Cancer Intelligence Network to coincide with the Expert Roundtable. This paper will be invaluable to any organisation concerned with improving male health. It can also be downloaded as a stand-alone document from the website of Cancer Research UK, as can its predecessor document of the same title, which was published in 2009.

# Acknowledgements

## The Men and Cancer Expert Roundtable

The Men and Cancer Expert Roundtable was a joint initiative between the Men's Health Forum, the National Cancer Equality Initiative and the Department of Health. The planning group was made up of:

- Tim Elliott, Department of Health
- Joanne Rule,  
National Cancer Equality Initiative
- David Wilkins, Men's Health Forum

The planning group is grateful to Peter Baker, independent Men's Health Consultant, and Suzi Chung from the National Cancer Action Team, for their work in identifying the right speakers and participants; putting together the background papers for the roundtable; and managing the event on the day.

We are also extremely grateful to the sponsors of the roundtable, without whose generous support and commitment to improving male health, the event would not have taken place:

- Novartis
- Sanofi Pasteur MSD
- Bristol-Myers Squibb

We thank Professor Alan White, who co-chaired the event along with Joanne Rule.

We are also grateful to the five speakers. Each speaker gave an expert and thought-provoking presentation. Thanks are also due to the National Cancer Intelligence Network and Cancer Research UK who produced a comprehensive statistical review of the present position in relation to cancer in men to coincide with the Roundtable (see Appendix 4).

Finally we acknowledge the contribution of those people who attended and were nominally "the audience". Seldom have so many experts on the connection between cancer and men's health been brought together in this way. The roundtable was conceived as a participative event at which everyone present would be given an opportunity to share their experience and opinions. As this report demonstrates, the outcome was a significant number of new insights and ideas.

### The proceedings document

I thank the speakers for reviewing my reports of their presentations. I hope I have done justice to their contributions on the day. I am particularly grateful to Tim Elliot, Joanne Rule and Martin Tod, CEO of the Men's Health Forum, for reviewing the complete document.

David Wilkins,  
Men's Health Forum

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## Background to the Roundtable

In June 2004 the Men's Health Forum (MHF) dedicated its annual campaigning week, *National Men's Health Week*, to the theme of "cancer in men". Historically, cancer prevention campaigns targeted at men had tended to concentrate on the male-specific cancers, particularly prostate cancer and testicular cancer. The MHF campaign sought instead to draw public and professional attention to the significantly higher incidence and mortality among men of those cancers that are not specific to one sex or another.

The campaign document<sup>1</sup> pointed out that although the total number of UK deaths from cancer was roughly equal between men and women, the incidence rates for the non-sex specific cancers at all ages were markedly higher for men. (The equality of the total numbers is partly explained by the higher number of female-specific cancers and partly by the fact that women live longer than men and are therefore more likely to develop cancer.)

The 2004 campaign observed that the reasons for higher incidence and mortality rates in men were, at best, only partially understood. Those explanations that were known tended to be centred around men's poorer help-seeking behaviours. This suggested that there was very much more to be done to improve cancer prevention services for men, and to encourage men to seek medical help in good time when symptoms become evident. As the campaign document pointed out:

*Such disparities [in cancer incidence and mortality] would undoubtedly (and rightly) be the subject of targeted strategies if they were related to social class or ethnic origin rather than sex.*

As a consequence of the campaign during National Men's Health Week 2004, Professor Sir Mike Richards, who was then National Clinical Director for Cancer, invited the MHF to organise a small high-level symposium to explore the following basic question: Why are cancer incidence and mortality rates so much higher in men than women?

That symposium took place in November 2006 at Leeds Metropolitan University, where it was hosted by the university's Centre for Men's Health. The symposium also looked at a number of important secondary questions, including whether men seek medical help at a later stage in the development of symptoms than women; whether men's lifestyles put them at greater risk of cancer; and whether men and women with similar cancers receive similar treatment. Early in 2007, the proceedings from that symposium were published by the MHF.<sup>2</sup>

In December that year, a new national strategy for cancer, the *Cancer Reform Strategy* (CRS), was published.<sup>3</sup> The CRS noted the recent debate about cancer in men and observed that:

*... there are still many cancer types for which the reason for higher incidence and mortality in men is not known ... It is clear that more research is needed if we are to fully understand how gender impacts on cancer.*

The CRS also established a number of new national bodies intended to improve knowledge, understanding and data provision in relation to the planning of cancer services. One such body was the National Cancer Equality Initiative (NCEI), which was given the responsibility for recommending actions to address inequalities in cancer outcomes between different population groups. Since its inception, the NCEI has consistently sought to develop a better understanding of men's needs in relation to cancer diagnosis, treatment and care. The NCEI was co-organiser of the event that this document reports.

Another body established by the CRS was the National Cancer Intelligence Network (NCIN). NCIN has also contributed significantly to our improved understanding of the issues in relation to cancer in men. In 2009, in partnership with Leeds Metropolitan University (Leeds Met), MHF and Cancer Research UK (CRUK), NCIN published a statistical briefing paper which starkly demonstrated the degree to which men are more likely to develop and die from the cancers that are not specific to one sex or another.<sup>4</sup> Even when lung cancer is excluded from the figures<sup>5</sup>, men are still 1.7 times as likely to die from the twelve other most common cancers.

Also in 2009, following its Inquiry into Inequalities in Cancer, the All Party Parliamentary Group on Cancer said it was "persuaded of the need for more research" to understand why cancer mortality rates are so much higher in men for those cancers which are common to men and women.<sup>6</sup>

There has therefore been consensus for some years that our understanding of the causes of the excess incidence of cancer in men is inadequate. The statutory requirements on public service providers in the Equality Acts of 2006 and 2010 have further focused attention on the need to achieve more equal health outcomes between men and women where known disparities are not attributable to biological differences between the sexes.

The present limitations in our knowledge inevitably restrict the action that can be planned to improve cancer outcomes in men. Nevertheless, some good progress has been made. Many of the developments since 2009 are covered in the chapters which follow. We are particularly pleased that NCIN decided to publish, in conjunction with the original partners, a revised version of its 2009 paper to coincide with the Men and Cancer Expert Roundtable.<sup>7</sup> The data from the paper is reported later in this document, and the paper itself is attached at Appendix 4.

Alongside this paper, and also to coincide with the Roundtable, CRUK published a new briefing document which summarises some of the most important issues associated with cancer in men.<sup>8</sup> This paper can be found on the CRUK website.

This proceedings document is essentially "Volume II" to the proceedings document published following the 2006 symposium in Leeds. The question posed by Professor Mike Richards in 2006 still lacks a comprehensive answer of course, but the Men and Cancer Expert Roundtable sought to begin a wider

debate about what we can do now, in parallel with the search for explanations, to help close the gender gap in cancer mortality.

The Roundtable was attended by some of the foremost thinkers on the relationship between gender and cancer, and by national experts on improving male health. These participants heard a series of specialist presentations. A summary of each of these presentations is given in this document. In a lengthy open debate, the Roundtable also tried to prioritise the actions that need to be taken in the coming years to accelerate progress. That debate is also summarised in this document. The Men's Health Forum made a commitment at the Roundtable to develop a work programme on men and cancer, guided by the priorities that had been established.

Finally, it might be worth adding that, although we often speak about the "gender gap" in cancer incidence and mortality, this issue is not about disparities between men and women per se. The "gender gap" is the most straightforward way of making concrete the real underlying issue - that we are not addressing cancer in men as well as we should.

There are two challenges. The first is to develop a better understanding of the male-specific causes of men's greater likelihood of developing cancer. The second is to identify the male-specific actions that need to be taken to reduce cancer mortality in men. This should

go hand in hand with continued efforts to improve cancer outcomes for the population as a whole. Ultimately, that should result in improved outcomes for both sexes while simultaneously closing the gap between men and women where that is possible.

The Men and Cancer Expert Roundtable was organised in partnership between the MHF and the NCEI, with the support of the Department of Health. It was jointly chaired by Joanne Rule, co-Chair of NCEI, and Professor Alan White of the Centre for Men's Health at Leeds Metropolitan University, who was, at the time, also Chair of Trustees at the Men's Health Forum.

A full list of attendees is given at Appendix 1. The programme of presentations and discussions is at Appendix 2. Biographies of the speakers are at Appendix 3.

1 Men's Health Forum. National Men's Health Week 2004 Briefing Paper: Men and Cancer. London: Men's Health Forum; 2004.

2 Wilkins D. Tackling the excess incidence of cancer in men: Proceedings of the expert symposium held at Leeds Metropolitan University on November 16th 2006. London: Men's Health Forum; 2007.

3 Department of Health. Cancer Reform Strategy. London: Department of Health; 2007.

4 National Cancer Intelligence Network. The Excess Burden of Cancer in Men in the UK. NCIN: London; 2009.

5 The reasons why men are more likely to develop lung cancer are fully understood. It is almost entirely because of historically higher smoking rates among men (plus men's greater likelihood of occupational exposure to carcinogenic substances such as asbestos).

6 All Party Parliamentary Group on Cancer. Report of the Inquiry into Inequalities in Cancer. APPG on Cancer: London; 2009.

7 White A, Thomson C, Howard T & Shelton J. Excess Cancer Burden in Men. Cancer Research UK: London; 2013.

8 Cancer Research UK. Men's Cancer Briefing. Cancer Research UK: London; 2013.



## Chair's introduction to the proceedings

Joanne Rule

co-Chair, National Cancer Equality Initiative



Joanne Rule

Joanne welcomed delegates and thanked the sponsors of the Roundtable: Bristol Myers Squibb; Novartis; and Sanofi-Pasteur MSD. She would be chairing the day jointly with Professor Alan White.

Joanne explained that the day's proceedings had been designed to ensure that the widest possible range of experience and views was captured in the reporting of the event. Although there were designated speakers, all those present were experts in the field and their active participation was crucial to the success of the day. The role of the speakers was to highlight some of the more important aspects of cancer in men and/or suggest new ways of looking at the issue but it was not intended that the discussions would be limited to the subjects covered by the speakers.

Joanne confirmed that the proceedings of the day would be published. Above all, it was intended by the organising partners that the event would result in new actions intended to achieve better cancer outcomes for men.

# Men and cancer inequalities

Professor Alan White

Co-Director

Centre for Men's Health, Leeds Metropolitan University

## Introduction

Alan briefly re-iterated the history of work on men and cancer in recent years, during which time the emphasis has tended to be on our continued lack of a full explanation for the higher incidence and mortality rates in men. He stressed the need to keep looking for explanations but suggested it is of equal importance to make practical progress on the basis of what is already known. In particular, it is important to recognise that it is the full range of cancers that are important – not only the male-specific cancers.

Alan explained that the first section of his presentation would concentrate on the newly published update from Cancer Research UK to the influential 2009 statistical paper on cancer in men. (The new paper is at Appendix 4. See Introduction for information about the 2009 paper.) He would go on to prioritise some priorities for action within the boundaries of current knowledge.

## The most common cancers in men

Prostate cancer is the most commonly diagnosed cancer in men by some way. It accounts for a quarter of all new cancer diagnoses in men annually. Lung cancer and bowel cancer are also very important in terms of the proportion of diagnoses. Between them, these three cancers account for 53% of all cancers diagnosed in men each year. It is crucial however, that we do not concentrate on these three at the expense of other cancers. Although the other cancers account individually for a relatively small proportion of all diagnoses, they may well be more important in terms of causing deaths. Even a relatively uncommon cancer such as kidney cancer causes far more male deaths than – for example – road traffic accidents, which are

the focus of significant investment in terms of prevention.

There are two notable trends in cancer in men. The first is in prostate cancer where diagnoses have risen rapidly in the last two or three decades. Death rates for prostate cancer have however, not increased. There are two reasons for this. First, because male life expectancy has been increasing and prostate cancer is more common in older men. Second, because PSA (prostate specific antigen) testing became more widespread in the 1990s. The increased use of PSA testing has led to the diagnosis of a large number of prostate cancers that are not life-threatening in the short term and would previously have not been diagnosed before the patient died from another cause (such as heart disease). The second notable trend is in lung cancer where incidence in men continues to fall rapidly as a consequence of the gradual reductions in smoking rates in recent decades.



Professor Alan White

## Cancer incidence and mortality in men

The main purpose of Alan's presentation however, was to discuss excess cancer incidence and mortality in men by comparison with cancer incidence and mortality in women. Alan explained that the best way to understand differences in cancer incidence and mortality between the sexes is to use *rate ratios* which give us a simple, easily understood means of making the comparison. A rate ratio takes the lower rate as a baseline (in this case, usually female incidence and mortality) and then expresses the higher number as an excess proportion over that baseline.

Looking at mortality first, we can see that across all ages and including all forms of the

disease, men are 37% more likely to die from cancer than women. This is interesting in itself but if we remove from the overall figures, those cancers, such as cervical cancer, ovarian cancer and breast cancer\* that are specific to women, the excess mortality rate in men rises to 67%. In other words, men are 67% more likely to die from those cancers that, in theory at least, might be expected to affect both sexes equally. If lung cancer is removed from the calculation (because lung cancer is known to be higher in men for reasons that are fully understood – see Introduction), the excess mortality rate in men actually rises by 0.5%. There is therefore no very simple explanation for the difference in mortality rates between the sexes.

\* It is important to note that breast cancer is not a sex-specific cancer. It is however an exceptionally rare condition in men by comparison with women. It is therefore generally regarded for statistical purposes as being a sex-specific cancer.

Although the excess mortality rates vary from one cancer to another, the pattern is consistent. In all twelve of the most common cancers that can be developed by both sexes, mortality rates are higher in men. For some cancers, such as oesophageal cancer and bladder cancer, mortality rates are three times as high in men.

Alan pointed out also that some particular cancers occur much earlier in the lifespan of men than women. Death from oesophageal cancer is four times more common in men in the under 65 age group for example. Data such as these need to be taken very seriously indeed in light of the commitment in the NHS Mandate to focus on the prevention of premature death. Similarly, we need to note that although female-specific cancers account for 35% of deaths in women aged under 65, only 5% of premature male deaths are caused by male-specific cancers. In other words, if we are to tackle premature male mortality from cancer, we need to look at prevention and early detection strategies for all forms of

### Professor Alan White: Summary of Key Points

- ▶ It is important to find better explanations for the excess incidence of cancer in men - but that must not stop us developing new initiatives now.
- ▶ Prostate cancer, bowel cancer and lung cancer account for more than half of all cancer diagnoses in men but other cancers are equally important and may cause proportionately more deaths.
- ▶ Men are 67% more likely to die from those cancers that are not specific to one sex or the other.
- ▶ Men are 40% more likely than women to be diagnosed with cancer under the age of 65
- ▶ Men's lifetime risk of developing a non sex-specific cancer is 35% compared with women's risk of 25%.
- ▶ The less well off a man is, the higher his risk of dying from cancer.
- ▶ Action to prevent cancer in younger men, or to ensure early diagnosis when symptoms are present, will be vital to meeting the objectives of the NHS Mandate in relation to the prevention of premature death

cancer not just the two male-specific cancers - prostate cancer and testicular cancer - which have tended to be the focus of our attention in the past.

Incidence rates for cancer in men mirror mortality rates to a large extent. It is notable however, that among the under-65 population, there are proportionately more cancer diagnoses overall among women (in other words, the rate ratio is higher for women). This is because of the female-specific cancers that are concentrated in the younger age group. When only the non sex-specific forms of cancer are considered however, the pattern in this age group is similar to that for mortality rates, with men about 56% more likely to be diagnosed with cancer. One particularly interesting exception from the general pattern is malignant melanoma, where incidence rates are actually higher in women - although death rates, as we have seen, are still higher in men.

As one would expect, lifetime cancer risk is also greater for men for the non sex-specific cancers. For a baby born in 2010, the lifetime risk of developing any cancer is now roughly 40% for both sexes. If we remove the male-specific and female-specific cancers from the figures however, lifetime risk falls to 26% for women but only to 35% for men.

### Cancer survival in men

UK cancer survival data presents a more mixed picture. For some cancers, survival rates are better for men, for others survival rates are better for women. This differs from studies elsewhere in Europe which have shown a general pattern of poorer survival for men. It is unclear at present why UK figures

differ in this respect, and unclear whether any conclusions can be drawn from the differences.

Looking across Europe more generally, this pattern of poorer cancer outcomes for men is repeated fairly consistently. The extent of the differences varies considerably from one country to another however, with the former Eastern Bloc countries having the highest cancer incidence and mortality figures. This led Alan to explain that it is very well established within the UK, that cancer incidence and mortality vary by social class as well as by gender. Poorer men tend to have the poorest outcomes of all. Socio-economic data is not given in the newly published data (i.e. Appendix 4) but it is of great importance not to assume, just because we are discussing men, that all men (or all women for that matter) have equal cancer risks.

### Recent developments in policy and practice

Alan stressed the importance of recognising, during the day's discussions, that there have been developments in both practice and knowledge since the 2006 symposium. He highlighted the collaboration between Prostate Cancer UK, the NHS and the Department of Health in piloting a community-based prostate health clinic in Newham. This project sought to engage with men – particularly African-Caribbean men - in an informal community setting rather than in a primary care setting (ie a GP surgery). Over 300 men attended the Newham clinic in 98 days. Of those attendees who had potential prostate cancer symptoms, half had not previously consulted a GP. Nine new diagnoses of early stage prostate cancer were made as a result.

The Men's Health Forum's own Department of Health funded study on men's uptake of bowel cancer screening had made good progress on understanding why men were less likely to take up the offer of screening, despite being at greater risk of developing the disease. The study had made useful recommendations about how to increase men's engagement with the screening programme. Alan also commended the work of other charities, such as Orchid, the Urology Foundation and Macmillan Cancer Support who have taken action to improve knowledge on cancer in men, and to provide services for men.

General health improvement programmes aimed at men are also important. The generalised and familiar group of "lifestyle" risk factors that underlie – for example – the increased probability of developing heart disease, are the same as those that increase the risk of developing some cancers. *Premier League Health* is an example of a broad-based, large scale health improvement programme that set out specifically to reach men. 10,000 men took part in this programme, which exploited the appeal of football and the sense of belonging that many men feel towards local football clubs. Evaluation by Leeds Met of data relating to 4,000 of the participants found that seven out of ten had made positive changes to their health behaviours as a result of their participation in the programme.

### Priorities for future planning

Finally, Alan returned to the subject of the NHS Mandate and its clear focus on the prevention of premature death. He commended this objective to the Roundtable participants and emphasised again the

importance of addressing cancer in men if we are to achieve what is intended. Alan highlighted the following priorities as a framework for future planning:

1. Focus on preventing cancer in younger men
2. Raise awareness among men of cancer risk factors and symptoms
3. Increase the uptake of cancer screening where that is appropriate – in particular, tackle barriers that might prevent individual men from taking up the offer of bowel cancer screening.
4. Increase research and understanding in the following areas specifically in relation to men:
  - Causes, diagnosis and treatment of cancer
  - Best approaches for raising awareness
  - Increasing screening uptake
  - Maximising the chances of surviving cancer.

## Why the excess burden in men?

### An overview

Dr Noel Richardson

Director of the Centre for Men's Health, Institute of Technology Carlow, Ireland

Nick Clarke

Assistant Researcher, Centre for Men's Health, Institute of Technology Carlow, Ireland and Irish Cancer Society Research Scholar

#### Introduction

Noel began by explaining that his and Nick's presentation would be based on a study\* they had undertaken over the past eighteen months. The study was funded by the Irish Cancer Society and conducted in partnership with National Cancer Registry Ireland. Noel also wanted to be clear from the outset that explanations for the excess burden of cancer in men remain inadequate but that he and Nick hoped nevertheless, to be able to add to the knowledge of participants on the subject.

The objectives of the study were:

- To compile detailed incidence, survival and mortality cancer data, disaggregated by sex; and to examine these data in terms of a range of patient characteristics
- To present rate ratios by sex for cancer incidence and mortality
- To investigate which patient characteristics have an impact on survival
- To review the types of interventions that might help reduce male cancer mortality
- To inform, and provide an impetus for, the development of policy on cancer prevention in men, and men's health more generally.

The study was undertaken in the context of the Irish government's national policy on men's health, of which Noel was co-author. The Irish national policy is just approaching its five year review and it is intended that the cancer study will be used in the review process. Ireland remains the only country in Europe to have a dedicated national policy intended to improve male health.

The data used in the cancer study covered the period 1994 – 2008 and covered the five most common non sex-specific cancers in men (lung cancer, colorectal cancer, stomach cancer, bladder cancer and melanoma of the skin).

#### Cancer in men – the Irish data

Nick reported on the findings of the study in relation to incidence rates, mortality rates, rate ratios and survival. All five cancers showed a very similar pattern to the UK both in terms of incidence and mortality overall, and in terms of incidence and mortality ratios between the sexes.

The male survival data showed some differences from the UK data and is more similar to the pan-European pattern (see previous section which highlights the unexplained differences in UK data from the more usual European pattern). Five year survival for melanoma and lung cancer was similar for men and women but five year survival for the other three cancers was significantly lower in men: 44% lower for



Dr Noel Richardson

\* The Irish Cancer Society study is now published as: *A Report on the Excess Burden of Cancer Among Men in the Republic of Ireland*. It is available on the website of the Irish Cancer Society: [www.cancer.ie..](http://www.cancer.ie..)



Nick Clarke

colorectal cancer; 27% for bladder cancer and 44% for stomach cancer.

In addition to male sex, a number of other factors was associated with poorer survival. These were:

- being older (especially being over 75);
- being single, divorced, widowed or separated;
- being a smoker;
- presenting at a later stage in the development of the disease (more men than women were in this category for all the cancers studied, with the exception of bladder cancer);
- tumour site;
- histological classification of the tumour.

Even after adjusting for all these additional factors however, men still had poorer survival rates than women.

One year survival was similar for four of the five cancers studied but markedly lower – at 38% – for melanoma. This is especially significant, given that men were actually less likely to be diagnosed with melanoma and that five year survival was similar. The researchers concluded the most likely explanation is that men seek medical help later in the development of symptoms for this particular cancer.

Limitations on the available data meant it was not possible within the study to examine cancer survival (or the any of the other

factors) in relation to the socio-economic status of patients. Similarly it was not possible to cross reference the data with alcohol consumption levels, physical activity, obesity and overweight, or diet.

### Introduction to the explanations

Noel discussed the second part of the study which had attempted to find explanations for some of the sex differences that Nick had highlighted. These explanations fell mostly in the realm of lifestyle factors. Most published sources suggest that lifestyle factors and other preventable causes of disease account for around 50% of premature deaths by any cause. It is no surprise therefore that lifestyle differences between the sexes also appear to explain a large proportion of the differences in cancer outcomes between men and women. Noel stressed the great importance of viewing lifestyle factors within a broader social context and not attaching “blame” to men whose personal behaviours appear to put them at greater risk. An association with blame limits our flexibility in finding solutions.

### Smoking

Smoking remains the most important lifestyle factor. Historically, smoking has been culturally associated with particularly “masculine” forms of maleness and until recent years men have been significantly more likely to smoke than women. Data suggests that around a quarter of cancer deaths in Europe are associated with smoking, with 29% - 38% of cancer deaths linked to smoking in men, compared to 2% - 10% in women. Smoking is known to contribute to the risk of around 16 different cancers, with lung cancer of course, the most important in terms of numbers. One



crucial message that needs to be better communicated is that stopping smoking at any age will reduce the cancer risk. It seems probable that older male smokers in particular may feel that there is nothing to be gained by giving up smoking later in life but this is not the case.

In Ireland, among the least well off social groups where smoking is highest, the number of women who smoke has now overtaken the number of men who smoke, so the gender balance of this problem is likely to shift in the years to come. For now, we do know some specific and useful things about men and smoking: men score higher than women for nicotine dependency and derive more benefit from nicotine replacement therapy; men are known to benefit from smoking cessation support, particularly where that combines behavioural counselling and pharmacotherapy; and low perceived stress levels predict better smoking cessation outcomes for men. Despite there being a male-specific knowledge base however, there is a notable lack of smoking cessation programmes designed for men, particularly for men in those social groups that are at greatest risk. There have been examples in Canada of male-specific smoking cessation programmes in male-friendly settings (e.g. the workplace) that have worked well.

## Alcohol

Like smoking, alcohol has cultural associations with particular “traditional” forms of masculinity. Also like smoking, alcohol use has a stronger association with cancer in men than with cancer in women; 10% of cancers diagnosed in men are thought to be causally associated with alcohol, compared with 3% of cancers in women. In particular,

Irish data suggests that higher alcohol use in lower socio-economic groups is mirrored in higher incidence of alcohol-related cancers in these groups. In Ireland, diagnoses of alcohol-related cancers are rising rapidly with an 100% increase in women and an 81% increase in men predicted by 2020.

Although alcohol consumption among women in Ireland is rising, there remain marked gender differences, with men more likely to drink at all; more likely to drink to hazardous levels; more likely to binge drink; and twice as likely to drink alcohol daily (18% of men, compared to 9% of women). Boys start drinking at an earlier age than girls and are more likely to binge drink. Younger men in the lower socio-economic groups are the heaviest drinkers in the Irish population. Across Europe, diagnoses of chronic liver disease, a strong indicator of hazardous drinking patterns, demonstrate a consistent and significantly higher rate of male hazardous drinking in all countries.

Noel suggested that, as with smoking, it is important to realise that not all men have the same degree of risk. It is inevitable that we think in terms of men by comparison with women because that is the only way to understand the data at the “big picture” level. The differences between men and women however, are explained at least in part by differences between different sub-populations of men. Not all men drink to a level that they increase their cancer risk but some particular groups of men are more likely to do so. It is on those groups that we need to concentrate cancer prevention efforts.

Looking more broadly than the health behaviours of individual men or groups of men, Noel pointed out that there are particular



public policy issues associated with alcohol use that are common to Ireland and the UK. He highlighted alcohol pricing policies, sponsorship of sporting events by drinks companies, controls on the availability of alcohol to young people and the generalised, uncritical socio-cultural acceptance of alcohol use.

### Unhealthy diet, obesity and physical inactivity

Although these factors are inter-related to some extent, Noel stressed that they are best considered separately. On this occasion, he discussed them together only for the sake of brevity. All three factors are associated with an increased risk of cancer.

The evidence in relation to diet is still developing but it is believed that cancer risk may be increased by high intake of red and processed meat, high intake of dairy products and by consuming highly refined grains and starches. Irish data suggests that men are more likely to consume fried food four or more times per week, more likely to exceed the recommended two servings of meat, poultry or fish per day and more likely to exceed the recommended daily servings of milk, cheese and yoghurt.

Obesity and overweight are particularly well-established as factors increasing the risk of developing cancer. Across the EU as a whole, roughly the same proportion of men and women are obese (BMI of 30+) but men are more likely to have a BMI over 25. In other words, proportionately more men are overweight. A notable factor in relation to weight gain is that men are more likely than women to become overweight earlier in life;

from age 30 onwards many men gain weight rapidly.

Other relevant factors in relation to male diet and weight that have been substantiated by research are that:

- Men tend to have a less healthy diet overall
- Overweight men are less likely to see their excess weight as a cause of concern
- Men in more traditional families and communities often lack control over their diets and are less knowledgeable about healthy eating
- Men are proportionately more likely to work unsociable hours, which can make it more difficult to eat a healthy diet
- Men can often be resistant to healthy eating messages
- Men's approach to food is often "pleasure-oriented", with healthier foods often being seen as insubstantial or as having other negative associations
- "Bigness" is associated with more dominant notions of masculinity, leading some men to feel more positive about a large body frame.

When it comes to tackling weight problems, men are less likely than women to consider reducing their calorie intake as an acceptable option. They are however, more likely to feel positive about exercise and sport as a means of losing weight. Research also suggests that

men may respond particularly positively to the idea of dietary change and/or losing weight when they prompted on these matters by their GP.

Across the EU, men are more likely than women to have more physically active lifestyles. Even so, over half of men do not exercise at recommended levels and one third of men are sedentary. Increasing numbers of men have sedentary occupations. Levels of physical activity in men are known to decline with age.

### Men's use of health services

Across Europe, the data shows a consistent pattern of women using primary care more often than men. Noel pointed out however, that greater female use of primary care is to be expected because women inevitably make more visits associated with both contraception and pregnancy. It is therefore not entirely clear whether men can be said definitively to be poorer users of primary care. On the other hand there is a very clear Europe-wide pattern, for all the most common causes of serious illness and injury, of men being more likely to be treated as hospital in-patients. This is generally believed to indicate that men tend to present at a later stage in the development of symptoms.

Research suggests that the following factors may limit the effective use of health services by men in relation to potential cancer symptoms:

- Lack of recognition of symptoms and/or failure to interpret symptoms as needing medical opinion
- Absence of pain or a lump and/or belief

that symptoms will go away

- Embarrassment about sexual areas of the body
- Fear of loss of sexuality after treatment
- Seeing help-seeking as un-masculine
- Not wanting to appear “neurotic”
- A belief among men that women find help seeking easier because of their greater contact with health services.

Noel also drew attention to research indicating that men may be more likely to seek help if sanctioned to do so by family or friends or if their illness is affecting their ability to work.

### The views of roundtable participants

At this point Noel and Nick asked three different sections of the audience each to consider a particular question. The opinions and recommendations from each group are summarised below each question:

#### **1. Which has the most potential to reduce incidence of cancer in men – earlier diagnosis or improved lifestyles and more effective cancer prevention?**

There was a clear split between the two groups discussing this point.

The first group felt that prevention was the more important issue. This was first because around 45% of cancers in men are thought to have a preventable cause. Second, it was because improvements in male lifestyles that would prevent cancer would also prevent other serious illnesses such as heart disease,

stroke and diabetes. The group acknowledged that the drawback in focusing on cancer prevention is that significant results will not be seen for a long time, which makes this approach politically difficult. For this reason the group added the caveat that we should try not to lose the focus on early diagnosis where the benefits, though smaller, will be seen more quickly. In the case of both prevention and diagnosis, the group believed that we need to concentrate much more on those groups at highest risk.

The second group favoured giving highest priority to early diagnosis - precisely because of the political difficulties inherent in prevention. Their pragmatic view was that results that take decades to achieve do not attract funding and indeed, may lose funding because there are no "results". There was some support from the floor for this analysis.

## **2 What changes to data collection and analysis would supply the most useful information in terms of planning to reduce cancer incidence in men?**

The responses to this question are most easily presented in list form. In each case below, it is to be taken as read that data needs to be capable of analysis by gender:

- Better data on socio-economic groups and black and minority ethnic (BME) populations in relation to cancer. More accurate data of this kind would enable us to target interventions more effectively
- More and better data on occupational exposure to cancer-causing materials and chemicals

## **Dr Noel Richardson and Nick Clarke: Summary of Key Points**

► The availability of data that can help explain men's higher risk of cancer is improving but our understanding remains imperfect.

► Men have poorer survival rates for most of the cancers considered in the Irish study, even when all external factors (such as age, marital status, stage of presentation etc.) are controlled for.

► Lifestyle differences between men and women explain the majority of the differences in cancer outcome between the sexes where those differences can be explained. Some groups of men have much worse outcomes than others however, so it is important not to think solely in terms of differences between men and women. The sex difference in cancer outcomes is to do with higher incidence in some men not higher incidence in all men.

► The most familiar lifestyle factors (smoking, alcohol consumption, obesity and physical inactivity) remain the most important. For almost all of these factors, there are clear, measurable differences in risk between men and women – with men tending to exhibit the higher risk behaviours more commonly. In other words, we are already fairly well informed about the things that men do that put them at higher risk of developing cancer

► In general terms, men are poorer users of health services than women. Although there is still more to be learned about why this should be, we do already have a good understanding of some of the most important factors.

- More accurate recording of cause of death on death certificates
- Better lifestyle data, particularly on those groups that are at greatest risk of developing cancer
- Improved linking of cancer data to lifestyle data
- Better data on cancer and co-morbidities
- Migratory data, particularly on Eastern European populations
- Faster reporting of data. Cross-tabulated data is always reduced to the speed of the slowest reported
- Examination of whether the questions in the Census could be made more useful in terms of our knowledge of population health
- Examination of whether it is possible to work with supermarkets to add the voluntary collection of lifestyle data to club card schemes.

when there are children present. There was support for opportunistic “brief interventions” by GPs, particularly in relation to men who are overweight. The groups also thought there was merit in tackling alcohol abuse and male weight problems simultaneously by linking the two. Finally, the group thought that there was much more that would be done to take health promotion interventions into the workplace.

The second group concentrated on the role of GPs and primary care in improving male health. This group also favoured GPs opportunistically discussing lifestyle issues with male patients. It was also felt that GPs and primary care staff could do more to engage with their local communities through patient groups, developing links with schools and so on. The group felt there was more to learn about how men would like to use primary care – for example, would men prefer telephone consultations to attending surgery? There was an argument for primary care providers actively seeking to understand what men want from the service and for targeting men from particular population groups.

### **3. What changes to health policy and practice would be of greatest benefit in reducing the incidence of cancer in men?**

The first group chose to look at lifestyle issues known to have a link to cancer. It was thought that men might be encouraged to give up smoking by addressing them as fathers, responsible for the good health of their children. In other words, men might respond to messages not to smoke in cars or at home

# Do men present late or don't they?

## What we know and what we still need to know

Kathy Elliott MSc FFPH

Public Health Consultant

National Lead for prevention, early diagnosis and inequalities,

National Cancer Action Team



Kathy Elliot

### Introduction

Kathy explained that she would be concentrating on what we can actually do to reduce the incidence of cancer in men and to ensure that men seek help as early as possible when they develop potential cancer symptoms. One of the guiding principles of those working to improve prevention and early diagnosis at national level in recent years, has been to monitor and evaluate initiatives in as near as possible to real time. The benefit of this has been that it has been possible to spot emerging trends very quickly. Part of Kathy's presentation would concentrate on a particular initiative which appeared to have been disproportionately beneficial for men, even though that was not its express intention. She would describe the initiative, summarise the data and discuss the reasons why men in particular appear to have benefited.

First however, Kathy would explain the role of the National Cancer Action Team (NCAT) and the National Awareness and Early Diagnosis Initiative (NAEDI) in improving cancer outcomes. In doing this, she would highlight what NAEDI has learned in relation to the barriers to help-seeking behaviour. Kathy would also briefly describe the relevant areas of national cancer policy where that would help with the discussions later in the day. Within this contextual information, she would highlight the particular issues for men.

### The policy context

NCAT's work on prevention and early diagnosis is informed by a commitment also to reduce inequalities in outcome, including

inequalities in outcome between men and women. This approach has been centred on partnership working, with a particular emphasis on partnership with the third sector and with NHS Cancer Networks. There has also been a focus on the role of primary care. NCAT has established a national network of 120 GPs who provide clinical leadership in improving the contribution that primary care makes to the cancer pathway.

NCAT's work is closely aligned with the work of NAEDI. NAEDI was established in 2008 as a result of a commitment made in the *Cancer Reform Strategy* (CRS) to improve early diagnosis. NAEDI's role was confirmed in the government's 2011 national cancer strategy, *Improving Outcomes: A Strategy for Cancer*. This strategy committed the NHS to save an additional 5,000 lives from cancer by 2014 – 15. This objective would see England match the average European cancer survival rates. The government has also recently published the *NHS Outcomes Framework* and the *Public Health Outcomes Framework*. These new policies have added impetus to NAEDI's work. The new framework documents are also sensitive to the need to tackle inequalities in outcome whilst simultaneously improving cancer care for the whole population.

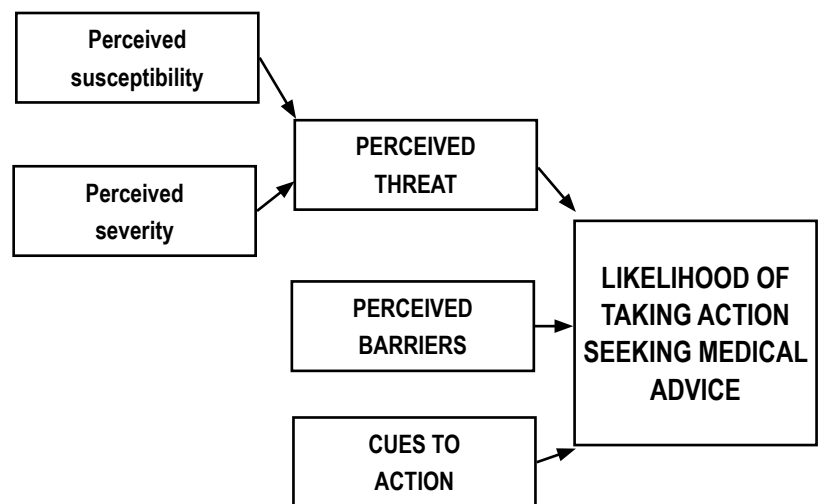
### What inhibits help seeking?

NAEDI's work since 2008 has pointed towards three factors which militate against timely diagnosis of cancer:

- Low public awareness of symptoms and/or negative beliefs about cancer

- Late presentation to a GP, even where patients are aware that their symptoms may be serious
- System delays in the NHS – for example where symptoms are vague or masked by other diseases, or where GPs do not have access to appropriate diagnostic tests.

On the second of these points – delays in attending primary care with symptoms – NAEDI has been interested to understand what factors influence people's help-seeking behaviours. The model opposite describes NAEDI's current thinking on this matter:



The model incorporates three factors that bear upon people's likelihood of visiting their GP with symptoms.

The first is their perception of the **threat** to their health. If they feel no threat they may not seek help. People may feel no threat because they do not believe their symptoms to be severe enough to matter, or they may believe that they are not at risk because – for example - they are too young or too apparently healthy.

The second factor is the existence of **barriers** that people are not able or willing to overcome. Sometimes these barriers may be to do with the patient's personal circumstances (e.g. the patient can't afford the time off work). Sometimes they may be associated with the patient's perception of the healthcare system (e.g. the patient is worried that he or she will be seen as wasting the GP's time; he or she may not feel confident to deal with the appointments system).

The third factor is the availability (or lack of availability) in the patient's life of "**cues to action**". Cues to action may come from friends and relatives or from the media or from health promotion messages. The right cues at the right time are known to encourage people to take action.

All three of these factors (threats, barriers, cues to action) may vary by gender and Kathy agreed with the earlier speakers that it is probable that gender differences in health knowledge, attitudes and behaviours are contributing to men's poorer outcomes. That is exactly why it is important to understand whether men and women respond to early diagnosis initiatives differently. The findings from the initiative she would now describe appeared to shed new light on those differences.

### Male response to the National *Be Clear on Cancer* Bowel Cancer Awareness Campaign

The most visible part of NAEDI's work has been the various mass media campaigns (billboards, T.V., radio and print media), using the generic slogan *Be Clear on Cancer*. The campaigns have been run locally, regionally and nationally. The national campaigns have sought to raise public awareness of the symptoms of bowel and lung cancer. The regional campaigns have focused on breast cancer in older women and bladder/kidney cancer. Local campaigns have promoted awareness of the symptoms of oesophageal cancer and ovarian cancer, and used a generic approach to cancer symptoms called *Know4sure*. The campaigns have evaluated very well with both health professionals and the general public. The *Be Clear on Cancer* campaign is ongoing and evaluation will continue.

Evaluation metrics for the campaigns have included:

- Measuring public knowledge of the campaign messages and its calls to action
- Measuring GP attendances associated with the symptoms highlighted during the campaigns
- Measuring GP referrals to secondary care under the "two week wait" system
- Measuring cancer diagnoses in secondary care (including whether there was a shift towards more earlier stage diagnoses)

- The effect on cancer screening rates where that was part of the campaign.

During the bowel cancer awareness campaign, the availability of some additional funding made it possible to measure GP attendances in greater detail over a larger number of practices. In total, 355 GP practices submitted data. During the period of the campaign, which was targeted particularly at people aged over 50 in lower socio-economic groups, the average weekly number of GP visits for bowel symptoms in these 355 practices increased by 30% by comparison with visits during the previous year. This is equivalent to an average increase of somewhere between one and two extra visits per practice per week for the duration of the campaign.

This figure for all patients however, masks the very intriguing finding that visits by men increased by 37% compared with a 22% increase in visits by women. Notably also, the age profile of men visiting their GP was younger than the age profile of women – 72% of men were under 60, compared with 61% of women.

A comprehensive evaluation of the National Bowel Cancer Awareness Campaign is available at the NCAT website [[www.ncat.nhs.uk](http://www.ncat.nhs.uk)]. This evaluation includes all the data from the campaign.

There is no clear explanation why the National Bowel Cancer Awareness Campaign should have prompted men to take action more readily than women, or why it worked well with more men at younger ages. These were not expected outcomes, so there was no specific



evaluation measure in place to understand them. Kathy and her colleagues have speculated that the simple, straightforward and directive nature of the message may have worked particularly well with men; indeed the broader evaluation of *Be Clear on Cancer* has shown that the messages have proved memorable to men more widely. It also seems possible that the campaign may have functioned to “give permission” to men to seek help, either directly or because it prompted discussion within family or friendship groups in which men were encouraged to go to see their GP.

In the context of the day’s discussions, it was very important to the audience to know that this had happened even in the absence of a clear explanation. There is very little data available which demonstrates greater engagement of men in public health interventions – especially in circumstances where it is possible to show a measurable change in behaviour. Those planning campaigns in the future might want to reflect on these outcomes and consider whether there were aspects of this campaign that it might be useful to replicate.

## Discussion

Kathy then proposed audience discussion of the following three questions.

*Is there a particular problem of early diagnosis for men?*

*Do men and women differ in their reasons for not seeking help early enough?*

*How can primary care be made more accessible to men?*

The discussion prompted by the questions is reported below in general terms rather than as a series of answers.

There was consensus among some of those working directly with patients that men do seem more likely to present late by comparison with women. This was however, tempered by an acknowledgement that the evidence to support this belief is limited. Other participants disagreed and pointed out that sex differences in help-seeking may vary according to the cancer concerned; for example, recent research on lung cancer has shown that there is no difference between men and women in the timeliness of their help-seeking. This is probably because the symptoms of lung cancer can be dramatic and it will therefore seem obvious to most people that clinical advice is needed quickly. It was also pointed out that in the older age group, where most cancers occur, use of primary care services is much more equal between men and women. In other words, the extent of the delay, if there is any at all, is likely to vary not only from cancer to cancer but also perhaps from one age group to another. We do not currently have sufficient data to draw any definite conclusions.

It was observed by some contributors that men have lower awareness of symptoms than women and that that probably impinges on the likelihood they will seek medical advice early. In the case of testicular cancer, research suggests that the high profile awareness campaigns of recent years have measurably reduced the time from the appearance of symptoms to the seeking of help in individual cases. This greater awareness seems to have overcome socio-cultural obstacles to help-seeking in younger men.



### **Kathy Elliot: Summary of Key Points**

► Three factors contribute to late diagnosis of cancer:

- Low public awareness of symptoms and/or negative beliefs about cancer.
- Late presentation to a GP, even where patients are aware that their symptoms may be serious.
- System delays in the NHS.

► There are three potential explanations for late presentation (the second of the two bullet points above):

- Patient underestimates the importance of his or her symptoms
- Patient is inhibited by perceived barriers to his or her help-seeking
- Patient lacks a source of encouragement to seek help

► The National Bowel Cancer Awareness Campaign was measurably effective in reaching men. This is probably because it was simple and directive. It may have also acted to “give permission” to men to seek help.

► It is widely believed by many health

professionals that men tend to present later in the development of cancer symptoms. There is little evidence on this point however. Research so far suggests that gender differences in help-seeking are likely to vary from cancer to cancer, and perhaps from one age group to another.

► Men are believed to know less about cancer symptoms than women but there is some evidence that this can be overcome by targeted health information campaigns.

► NHS clinicians, networks and patients are providing leadership to prepare the NHS to respond effectively to more patients going to their GP with early symptoms of cancer.

► A steady focus on reaching men and women in lower socio-economic groups may be more important than a particular effort to reach men. If we get it right, targeting the least well off may be an effective way of also reaching men.

► It might disproportionately benefit men if we could make primary care services more flexible and accessible.

The value of the *Be Clear on Cancer* finding was thought to be that the campaign appeared to have influenced a group beyond the “worried well” (it is often a criticism of health improvement campaigns that responders tend to be those who are already taking their health seriously). There was support from the audience for Kathy’s explanation that the straightforward, directive nature of the campaign was one reason that *Be Clear on Cancer* worked well with men. Similarly, there was support for the theory that the campaign “gave permission” to men to seek help. It was noted that the notion of men needing permission was one of the key findings from the Men’s Health Forum’s study of men’s participation in the NHS Bowel Cancer Screening Programme.

Some concern was expressed that we should not concentrate on reaching men at the expense of reaching lower socio-economic groups as a whole. It was argued that effective interventions aimed at poorer communities would ensure that we reach the men at greatest risk. As a point of interest in response to this point, Kathy explained that analysis by deprivation in the same study shows that practices in areas with higher levels of deprivation saw an increase of 45.7% in visits for directly linked symptoms during the period of the campaign, compared with an increase of 24.4% in practices in areas of lower levels of deprivation.

There was support for the idea that primary care services could help by becoming much more easily accessible and flexible. It was suggested for example that it could be made easier to see practice nurses, if not GPs; that some services, particularly basic health checks, could be delivered away from the surgery; and that GPs could become more proactive in asking men about early symptoms, such as increased frequency of urination.

# Are men biologically at greater risk?

Professor David H. Phillips

Professor of Environmental Carcinogenesis, King's College London



Professor David Phillips

## Introduction

David explained that his expertise is in environmental causes of cancer. This meant that he had a good understanding across a wide range of cancer types but he had rarely been asked, as he had for this event, to use his knowledge to compare cancer incidence and mortality between men and women. Once he had received his invitation to speak however, he had looked at what was known about sex differences within his own field of interest.

## Cancer incidence and mortality by sex

David had looked at mortality data in the US. US data are similar to UK data in demonstrating that cancer incidence and mortality are higher in men for most cancers. David pointed out however, that there are a number of less common cancers where incidence and mortality are higher in women; for example, cancers of the gallbladder, thyroid and peritoneum.

In some cases, the explanations for sex differences in cancer incidence are pretty clear. Kaposi sarcoma, for example, which is almost 30 times more common in men (in the USA), is strongly associated with HIV/AIDS. Historically, HIV/AIDS has had much higher prevalence in men. Similarly, the only known cause of mesothelioma is contact with asbestos. Asbestos is a material to which men are very much more likely to have had occupational exposure. As we had already heard from some of the other speakers, higher rates of smoking and alcohol consumption in men are widely understood to offer at least a partial explanation for higher male incidence of a number of cancers.

There remains however, a number of cancers where the reasons for gender differences are very poorly understood.

## Learning to understand possible explanations

The most crucial point to understand is that the cause of virtually any cancer in any individual person is likely depend on a number of contributing factors. These factors fall into two broad categories.

**Genetic predisposition:** The inherited genome may make an individual more or less susceptible to the external causes of any particular cancer. Sometimes the inherited genome may even be the sole cause of a particular cancer. There has been significant research investment in recent years in identifying the specific genes associated with these purely genetic causes of cancer. Best estimates suggest however, that only around 5% - 10% of cancers have entirely genetic causes, with David's own instinct being that the proportion is probably at the lower end of that estimated range.

**Environment:** An individual's living environment is often the crucial component. David explained that, within this category, he included both the lifestyle factors, which the audience had already heard about from other speakers; and environmental exposure to chemicals associated with increased risk of cancer. Lifestyle factors are hard to change and environmental exposures can be difficult to control. Despite this, David stressed that the underlying message in his presentation was that cancer is overwhelmingly not a "throw of the dice". There is much that we can do to prevent cancer.

## Differences of risk between men and women

David identified four categories of risk that may differ between the sexes:

**Exposure:** Men and women may have different levels of exposure to cancer-causing agents. Participants had already discussed alcohol and smoking in some detail but differences in occupational exposure are also important, as are differences in exposure to infection (this latter would be dealt with by the next speaker).

**Lifestyle:** Sex differences here had already been discussed in detail (for example: differences in diet, obesity levels and physical activity rates)

**Prognosis:** Prognosis is often dependent on help-seeking behaviour, with early help-seeking strongly associated with a better prognosis. This subject had also already been discussed by participants.

**Susceptibility:** Differences in susceptibility may well be associated with biological differences between the sexes. This is the matter on which the rest of David's presentation would concentrate.

## The role of chromosomes and genes

All human beings, male or female, have 46 chromosomes in each body cell. 44 of these chromosomes – the *autosomes* - occur as 22 pairs. The other two chromosomes are the *sex chromosomes*. Women have two X chromosomes (XX). Men have one X chromosome and one Y chromosome (XY).

The Y chromosome has a limited range of male-specific functions and is generally concerned with spermatogenesis. The X chromosome, of which women have two copies, is much more complicated. It has a large number of genes associated with cancer and is therefore, of great importance in understanding the biological basis of cancer. In theory - because they have two copies of the X chromosome - women might be expected to express X-associated genes at twice the level of men. In fact, in females of almost all species, one copy of the X chromosome is "silenced" at birth – a phenomenon known as *X inactivation*.

In other words, women, like men, have only one functioning X chromosome in each cell in their bodies. X inactivation is random, meaning that approximately half of a woman's cells express the X chromosome that she inherited from her mother, and half the one from her father. Furthermore, X inactivation is not an entirely complete process. Around 15% of "inactivated" genes retain some function. It is also known that some women lose the X chromosome from body cells as they age. Usually – but not always – this is the "inactive" copy.

It is well known that cancer can result from *genetic mutation*. Genetic mutation is the process by which a gene undergoes permanent change as a result of contact with environmental carcinogens or by some other change occurring within a body cell. This is cancer that occurs genetically. It is now known however, that cancer can also be influenced by *epigenetic* processes.

*Epigenesis* is the process that allows or disallows the expression of different genes on the X chromosome (i.e. it “switches genes on and off”). It is also an important part of the process, in both sexes, by which organs within the body are constructed and bodily functions managed. Cancers of epigenetic origin are a response to malfunctions in these processes. The study of epigenesis is still a developing science and the detail of how epigenetic processes may contribute to individual cancers is extremely complex. For David’s purposes, the important point for the audience to understand was simply that there is a difference between cancer of genetic origin and cancer of epigenetic origin (although both genetic and epigenetic processes occur to some extent in most cancers).

It seems at least possible that differing functions on the X chromosome and differing epigenetic processes in men and women contribute to differences in the way cancer develops. Scientific understanding of this matter is very limited however. Most surprisingly, in the context of the day’s discussion, David pointed out that there seems, on balance, to be greater potential for problems in the epigenetic functioning of the X chromosome in women than in men (because of the more complicated role of the X chromosome in women that David had described). That would tend to point towards the likelihood of *higher* rates of cancer in women, making the overall picture even more cloudy.

Finally, in this discussion of the role of chromosomes, David explained that it is common for there to be damage to chromosomes in cancer cells. There may,

for example, be fragmentation of the chromosome, or excess chromosomes or *translocation* (part of one chromosome joined to part of another). This in turn will lead to genes failing to function properly. Serious genetic instability of this kind is a hallmark of cancer. Confusingly however, an inherent “background” level of genetic instability in cells is normal. This inherent instability is known to be higher in the cells of adult women than adult men (although no differences are discernible in the cells of boys and girls). Again, this factor points tentatively towards an expectation of higher rates of cancer in women.

### The potential role of sex hormones

David suggested that sex hormones were perhaps a more obvious starting point than chromosome differences if we are looking for an explanation for differential cancer rates between men and women. The difficulty is that the research base on this matter is not strong.

Some evidence in support of the sex hormone hypothesis can be found in relation to colon cancer, where hormone replacement therapy (HRT), which boosts oestrogen levels in post-menopausal women, has been shown to be protective against the development of the disease. HRT is also thought to be associated with less aggressive forms of colon cancer when it does occur. The exact mechanism for this is unclear but the theory is that it is in some way connected with the presence of oestrogen receptor ER-beta.

A similar explanation has been proposed to explain women’s better outcomes for gastric cancer, where there is comparable evidence

about the gains from HRT. Further evidence supporting this possible explanation is found in women who have a longer fertile life (i.e. a higher number of years from menarche to menopause). Such women have been observed to have a lower likelihood of gastric cancer. Similarly - but with rather less evidence – there is a suggestion that tamoxifen, which is an anti-oestrogen treatment for breast cancer, may increase the risk of gastric cancer.

David emphasised however that these factors were only ever likely to be additive – perhaps in a really quite small way - to explanations for gastric cancer and (particularly) colon cancer associated with lifestyle differences between men and women.

Because of historical patterns of smoking, lung cancer is currently on the decrease in men but on the increase in women. Women however, have better survival for lung and bronchus cancer. Again, a possible explanation for this is the expression of oestrogen receptor ER-beta, which has been detected in lung cancer cells in women. On the other hand, David's own research into lung cancer suggests that women may actually be at greater risk of developing lung cancer than men, if you calculate that risk on a "per cigarette smoked" basis.

As a final point in his discussion of sex hormones, David explained that there have also been theoretical papers suggesting that sex hormones may play some part in the epigenetic processes that he had described earlier.

## Immunological differences between men and women

The evidence in relation to sex differences in *immunosurveillance* (the response of the immune system) is extremely interesting. Again the mechanism here is probably sex hormones, so in addressing this aspect of the difference between men and women, David was to some extent continuing the preceding discussion of sex hormones.

The female immune system is known to produce a more vigorous response to "biological insult" than the male immune system. The evidence for this is found in women's known greater resistance to certain infections and in women's higher incidence of autoimmune diseases. Some research suggests that stronger immunosurveillance affords some protection against cancer, so it is at least possible that this factor may play a part in differences in cancer incidence and survival between men and women.

## The role of anti-oxidants

A poor diet is very well established as a risk factor for some cancers. It is also established that certain foodstuffs in the diet are protective against cancer although the precise mechanisms for that protection are not well understood. It is particularly well established that a diet high in fruit and vegetables and - by extension - rich in naturally occurring vitamins and minerals, is protective against cancer.

Many fruits and vegetables contain anti-oxidant compounds. Because oxidative damage to DNA in cells is one of the ways that cancer can start, there has been significant research interest in whether anti-oxidants in the diet can reduce the risk of cancer (i.e. anti-oxidants act to prevent oxidation). This

research has led to the discovery that men tend to exhibit more background oxidative damage to cells than women. This may mean in turn, that the environmental effect of oxidation-causing agents is greater in men than in women. This is a challenging area of science and the complex interplay of elements within a cell is difficult to unravel. Nevertheless, there are further hints here of biological differences between men and women in their susceptibility to cancer.

### Other plausible biological mechanisms

The human body typically reacts to environmental carcinogens by metabolising them in an attempt to excrete them. As part of this process however, some genes and enzymes can have the unfortunate effect of causing some carcinogens actually to become active. It is plausible that this effect of “potentiating” carcinogens, may happen more in men than women. There have been a number of theories about why this could be but there is little evidence at the moment.

### An unconsidered gender difference

David drew his presentation to a close by raising an interesting question about gender difference in the incidence of colorectal cancer that, as far as he was aware, remains unanswered. Obesity is known cause of a number of cancers, including gastric cancer, oesophageal cancer and colorectal cancer. The data shows however, that obesity increases the risk of colorectal cancer in men more than it increases the risk in women (i.e. over and above the risk associated with obesity in the first place). U.S. data shows that a BMI of over 30 increases the risk of colorectal cancer in women by 50% but in

### Prof. David H Phillips: Summary of Key Points

► Biological explanations for gender differences in cancer incidence and mortality are limited. There are some plausible hypotheses and some limited evidence in relation to:

- the role of the X chromosome;
- the role of sex hormones;
- sex differences in immunological function.

► Where there is evidence about biological factors, it tends to relate only to minor differences in specific cancers

► Biological explanations are believed to be much less important than lifestyle explanations. There are some known interactions between biological and lifestyle explanations.

► We have yet to identify the cause(s) of around 35% of cancers that occur in the population. It is crucial that we improve our understanding of the causes of cancer, so that we can improve cancer prevention. Better understanding of causes in general is likely to lead to a better understanding of sex differences.

► Research should be designed to incorporate analysis of the role of sex differences as an important variable, rather than treating it as a potential confounding factor.



men the increased risk is 100%. The effect of this on cancer incidence is that while 20% of cases of colorectal cancer in women are attributable to obesity, the figure for men is 35%.

### Conclusion

To end his presentation, David looked at the data in relation to known explanations for individual cases of cancer. Around 15% of cancers are thought to be caused by infections; 42% are attributable to the lifestyle risk factors that had been discussed earlier in the day; a small proportion (around 6% in total) are believed to be caused by pollution and occupational exposures; and around 2% are female-specific cancers associated with reproduction.

The remaining 35% of cancers still have no attributable cause. David made the point that this remains a matter of some concern and, of course, it adds to the difficulty in answering the questions about sex differences in incidence and mortality. David's personal view is that scientific investment tends to be weighted towards the treatment of cancer at the expense of the understanding the causes of cancer. It is the latter that will ultimately improve our knowledge of how to prevent cancer.

David identified three courses of action that would improve our understanding of differences in cancer incidence and mortality between men and women, whether those differences are attributable to biological causes or not:

- Investigate whether male-female differences in cancer incidence and mortality are changing
- Investigate further plausible mechanistic hypotheses
- Improve design of population studies to consider gender as an important variable, not a confounding factor

The last of these points is a matter of particular concern. It is possible that we are actively avoiding looking at sex differences in some studies because sex is regarded as a confounding factor - particularly in population studies. In other words, it adds to the difficulty of planning a study if it is ultimately to report separate findings for male and female study subjects. This is an attitude that we will need to change if we are to make significant progress. Researchers need to include in study designs an analysis of sex differences - even if that makes studies more complex.

### Discussion

In the discussion that followed his presentation, David was first asked whether chromosomal factors were the explanation for the much higher rate of cancer deaths in new born baby boys by comparison with new born girls. David observed that this was another interesting sex difference but that he could not explain it. Neither could anyone present in the audience. It was noted that this was another example of a little understood sex difference in cancer outcomes that adversely affects males.



David was asked why sex differences in cancer outcomes, despite being so clear in the data, do not seem to have attracted significant attention from scientists interested in explaining them. David said that he understood the logic of excluding gender as a potential variable in research studies. As he had explained, cancer is a highly complex, multi-factorial disease which makes studying it very challenging, whether that is at the cellular level or at the population level - or anywhere in between. Producing separate results for males and females can effectively double some of the complications that are encountered.

It was pointed out from the floor that there is an emerging interest now in “gender medicine” – that is to say, in the idea of clinical research and clinical approaches that take sex differences in biology into account. A faculty of gender medicine has been established in Berlin to develop understanding of these issues and there are now academic journals dedicated to the subject. A second contributor suggested that, as it is now often a requirement of research funding that datasets are made available online, there is now an opportunity to conduct secondary interrogation of data that was not reported by gender initially. Also, that some funders now make it a condition that any decision to exclude analysis by gender from findings must be justified at the proposal stage. It may be that we want to press for that approach by funders to become more widely used.

Finally, attention was drawn from the floor to the parallel between the analyses that David had given and on-going developments in our understanding of drug treatments for cancer (and other conditions). It is becoming clearer that medicines may act differently in men and women and it is important that we better understand why that should be. The mechanisms for these different actions are believed to be similar to those highlighted by David, with the sex hormones thought particularly likely to play an important role.

## Are bugs to blame? The role of infections

Mr Peter Greenhouse FRCOG FFSRH, Consultant in Sexual Health,  
Bristol Sexual Health Centre and Weston Integrated Sexual Health Centre

### Introduction

Peter began by explaining that, globally, around 17% of cancers are thought to be infection-related. The proportion is much higher in the developing world, where a quarter of cancers are thought to fall into this category. Across the developed world as a whole, the average is around 7%. In the UK, the proportion is lower, at around 3.5%.

Peter made the point that although 3.5% may sound like a small figure, the importance of understanding the relationship between infection and cancer, is that it opens the door to actions to prevent cancer by treating or preventing the infection. His presentation would look at the various infections associated with cancer, and then go on to discuss whether there is an opportunity for primary prevention in some cases. He would also discuss whether there was anything we can do to improve early diagnosis of these cancers and look at the kinds of public education that might help. He would concentrate of course, on the particular implications for men.

### Infections associated with cancer

A number of infectious agents are known to cause cancer. All but one are viruses (see list below). Peter stressed that it was important to understand from the outset that the prevalence of an infection in the population is not linked to the proportion of the cancers it may cause; for example, Epstein–Barr virus is a common infection carried by 95% of people but it causes only a small proportion of cancers. Ranked in order of importance as causes of cancer (i.e. not in order of their prevalence in the population), the infections that are known to cause cancer are as follows:

- Human papillomavirus (HPV)
- Helicobacter pylori (H. Pylori)
- Epstein–Barr virus (EBV)
- Hepatitis C virus (HCV)
- Hepatitis B virus (HBV)
- Human immunodeficiency virus (HIV)
- Human herpesvirus-8 (HHV8)
- Human T-lymphotropic virus type I (HTLV1)

Peter explained that he would come back to HPV later in his presentation because it is by far the most important cancer-causing infection and the one on which he intended to concentrate. It was also the one he knew most about. He therefore began with the second most common infectious cause of cancer before working through the rest of the list in descending order:

### H. Pylori

H. Pylori is the only bacterium in the list of infectious agents; all the rest are viruses. H. Pylori is thought to cause around 60% of gastric cancers. Prevalence of H Pylori gradually increases with age; only around 2% of under-10s carry the infection but by age 80 around 30% of people have it. At all ages, H Pylori is 10% - 20% more common in men. As the audience had already heard from other speakers, gastric cancer is more common in men than women.



Peter Greenhouse

## EBV

As Peter had pointed out in his introductory remarks, virtually everyone has Epstein-Barr Virus. 90% of Nasopharyngeal cancers and 25% of cases of Burkitt's Lymphoma are attributable to EBV but these are extremely uncommon cancers (there are only about 600 cases each year of both cancers added together). EBV is also thought to cause around 45% of cases of Hodgkin's Lymphoma. Hodgkin's lymphoma is more prevalent than the two cancers previously mentioned but even so, it is relatively uncommon by comparison with the "major" cancers; there are around 1700 new diagnoses of Hodgkin's lymphoma each year. Men are slightly more likely to develop Hodgkin's lymphoma.

## HBV and HCV

The UK has the lowest rate of Hepatitis B infection in the world, with around 1 in 1000 of the population having the infection (in Hong Kong by comparison 20% of the population is infected). These low rates are probably because historically, the UK has experienced minimal rates of heterosexual transmission and mother-to-child transmission. The UK is one of the few countries where there is no universal vaccination of children. Despite the easy availability of vaccination for high risk groups, HBV is three to four times more common in men at all ages.

Hepatitis C, for which there is no preventive vaccine, also has a low overall prevalence rate with less than 1.5% of the population infected. The primary route of transmission for HCV is intravenous drug use. The second, less common but increasingly important, transmission route is between HIV-positive men (heterosexual transmission of HCV is

virtually impossible except at seroconversion and is rarely seen). Men are roughly three times more likely to be HCV infected. This is mostly because more men inject drugs.

Between them, HBV and HCV are thought to cause around 16% of hepatocellular cancers, the most common form of liver cancer. The great majority of these cancers that are attributable to HBV and HCV occur in men (approx. 450 cases of the 560 UK diagnoses p.a).

## HIV

Prevalence of HIV varies very greatly around the country from one in every 2,000 – 3,000 people in most places to one in a hundred in some parts of London. The most common cancer associated with HIV is non-Hodgkin's lymphoma which, although it is actually caused by EBV, only occurs because the EBV is "triggered" by the immunosuppression that results from HIV infection. The relative risk of non-Hodgkins lymphoma among people with HIV has been estimated at between 160 and 630 times greater than the rest of the population.

A similar mechanism (immunosuppression caused by HIV) facilitates Human Herpes Virus 8 (HHV8) infection which causes 95% of cases of Kaposi's sarcoma (KS). Peter pointed out however, that greater awareness of symptoms and early access to anti-retroviral treatment mean that this form of cancer is now very rarely seen by comparison with the early days of HIV/AIDS in the UK, when some 50% of men attending major centres of HIV care had overt signs of KS.

## HPV infection and cancer

Human Papilloma Virus is transmitted by sexual contact. It is a ubiquitous infection and it is estimated that around 90% of the population will have been exposed to genital HPV by the age of 25. In most people, most of the time, HPV infection causes no problems and is spontaneously cleared by the body's immune system within two years. In other words, while most of us have been infected, few are affected. The overwhelming majority of people will never know that they have had it.

The people at greatest risk of problems from HPV infection are those in whom the infection persists beyond the age of 25. This happens most commonly in those with poor immune function (e.g. people with diabetes, smokers, those on steroid therapy, people with HIV). HPV infection can, in time, cause genital cancers, and cancers of the mouth and throat. Much of the cancer burden of HPV infection falls on women via female-specific cancers. HPV is the sole cause of cervical cancer. It is also responsible for 40% of cancers of the vulva and over 60% of cancers of the vagina.

In addition to these female-specific cancers of the reproductive system, HPV causes a proportion of non gender-specific cancers, also related to sexual activity. These include anal cancer, and cancers of the oral cavity, oropharynx and larynx. It is estimated that HPV causes 90% of cancers of the anus (twice as common in women than all men, but some 30 times more common in homosexual men); 8% of cancers of the mouth, 14% of cancers of the oropharynx, and 11% of cancers of the larynx (all three of which are more common in heterosexual men).

HPV also causes 40% of penile cancers. Penile cancer remains a very rare disease with fewer than 500 diagnoses in the UK per year (although incidence has been increasing in recent years). Overall, HPV infection certainly causes more cancers in women than men although, as Peter pointed out, it is important to note that the incidence of HPV-related cancers in men is increasing sharply.

In addition to its role in cancer, HPV causes genital warts. Genital warts are far more common than HPV-related cancers. Diagnoses of genital warts are more common in men (326,000 diagnoses p.a. across Europe, compared to 289,000 cases in women), probably because of simple ease of recognition.

Vaccination effective against high-risk HPV was introduced in the UK in September 2008 with all 12 to 13 year-old and 17 to 18 year-old girls being offered the vaccine. Over the coming decades it is hoped that the vaccination programme will gradually eliminate cervical cancer and reduce incidence of all the other HPV-related cancers in women and younger heterosexual men (protection of the latter will come from "herd immunity" as the prevalence of HPV infection in the population as a whole falls). Peter was largely responsible for the successful political and public campaign to have the dual-purpose HPV vaccine introduced in UK schools from September 2012. It will however, take many years to see a significant reduction in overt genital warts, as only the youngest cohort (12-13 year olds) has had this vaccine.

In Australia, where a somewhat more extensive national HPV vaccination

programme for girls and young women was introduced in 2007, the short term benefits of dual-purpose HPV vaccination can already be seen. Cases of genital warts in women aged under 21 have fallen by 96% and in men aged under 21, by 81%. The Australian data however, clearly demonstrates that there is one population group who have not benefited from the vaccination programme – cases of genital warts in men who have sex with men (MSM) have remained at the same level as before the vaccination programme, despite the huge reduction of cases among the heterosexual population. This is because MSM are less likely to benefit from the herd immunity resulting from vaccinating girls.

Australia has now decided to extend the HPV vaccination programme to include 12 – 13 year-old boys as well as girls. Were the programme to have remained unchanged, the near certainty was that incidence of HPV-related cancers among MSM would have continued to increase while cancers among heterosexual men and women declined.

Peter explained that he was in favour of extending the UK vaccination programme to include boys. There were several reasons for his taking this position. The first is the obvious one that the herd immunity element of the present programme will not protect MSM from cancers caused by HPV (or from overt warts). Anal cancer in particular may be virtually eliminated in women in the future while incidence in MSM will continue to increase. The second is that vaccinating boys would significantly shorten the timescale for reduction of all HPV-related cancers in both men and women. Third, vaccinating boys would help protect women who had – for one

reason or another - not been vaccinated. Finally, vaccination of boys would protect male UK citizens from HPV when they “step outside the herd” – for example, when they have sexual contact with people from countries which do not have a vaccination programme.

Peter also pointed out that we have learned more in recent years about the connection between oropharyngeal cancer (throat cancer) and HPV. As he had already shown, men are at greater risk of developing throat cancer than women. The highest proportion of diagnoses is among men in their forties and fifties. In that age group new diagnoses of throat cancer in men have doubled since 2000 and men are twice as likely as women to develop the disease. Because throat cancer is usually asymptomatic until a very late stage, the prognosis for these men is often poor.

Historically, we have regarded smoking as the most significant cause of throat cancer but half of all throat cancers occur in men who do not smoke – and indeed, the incidence of smoking-related cancers is falling as the proportion of men who smoke falls. Many of these cases of throat cancer in men are caused by HPV infection. It is also important to know that heterosexual men are at much greater risk of throat cancer than women and MSM. This is because the mucous membranes of the vulva and vagina shed a massively higher concentration of HPV particles during oral sex than the penis. This means consequently, that cunnilingus is a much riskier activity than fellatio.

On the subject of smoking, Peter summarised an established connection between smoking and a greater likelihood of persistence – or

non-clearance - of HPV infection. Smoking has a deleterious effect on the body's *Langerhan's cells* (immune surveillance cells in the skin) causing them to become less effective and sometimes entirely depleted. Langerhan's cells play a pivotal role in clearing the body of HPV infection. This interaction between smoking and HPV infection explains why HPV-related cancers are much more common in smokers – indeed, virtually all cases of cancer of the cervix and vulva occur in women who smoke.

## Discussion

A question was asked about whether we might expect higher rates of HPV-related cancers in men and women now in their fifties and sixties, as a consequence of the sexual liberation that occurred when they were young people in the 1960s and 1970s. Peter confirmed that this was the case and that this is observable in currently available data, although an otherwise expected increase in cervical cancer has been prevented by the introduction of the cervical cancer screening programme since 1988.

Attention was drawn from the floor to the national campaign asking government to re-consider its decision not to extend the UK HPV vaccination programme to boys.

### Mr Peter Greenhouse: Summary of Key Points

► Infectious causes account for only a small number of cancer cases but are nevertheless important because understanding the infection can lead us to effective prevention and/or treatment strategies.

► Infection causes a proportion of several cancers that are more common in men, although it is not always clear why that is.

► Human papillomavirus is, by some margin, the most important infectious agent in causing cancer. Because HPV is implicated in a high proportion of cancers of the female reproductive system, it causes more cancers in women than in men.

► HPV is also a significant cause of cancer in men, causing more cases of throat and mouth cancer in men than it does in women. HPV also causes most cases of anal cancer in men and a significant minority of cases of penile cancer.

► The UK's national HPV vaccination programme is currently targeted only at girls. Recently-vaccinated girls will now be protected against high and low-risk HPV infection (and thus HPV-related cancers and genital warts) for life. Because HPV is sexually transmitted, the reduction of HPV among women will eventually reduce the prevalence of HPV in heterosexual men.

► Gay men will not benefit from the current HPV vaccination programme.

► There are strong arguments for extending the HPV vaccination programme to boys although this option has been ruled out by government on grounds of lack of cost-effectiveness.

► There are important interactions between HPV and smoking which put smokers at even greater risk of developing some forms of cancer.

# Open discussion session

Establishing priorities for future work

Led by Joanne Rule

## Introduction

The remainder of the day's event was given over to an open discussion based on what the audience had heard from the five speakers. The open discussion was intended to capture learning from audience members' own knowledge, expertise, and experience. The discussion aimed to answer three key questions:

**What don't we know that we need to know?**

**What ideas do we need to test or pilot?**

**What should be our policy priorities?**

All three questions were addressed using the same process; fifteen minutes of discussion in small groups followed by an open debate involving the whole audience. For the third of the above questions, there was also a series of votes intended to narrow down those policy priorities considered to be the most important.

**What don't we know that we need to know?**

The most important points are noted in summary form in the list below. Where it is a more accurate reflection of the discussion, these points are presented in the form of questions. The list is not in order of priority and does not reflect the order in which the points were raised on the day. Instead, the various points have been grouped by subject area. There is inevitably some overlap across the subject areas:

## Public health interventions

- We don't know enough in general about the link between public health interventions (e.g. cancer prevention

campaigns, symptom awareness campaigns) and changes in behaviour. This makes it very difficult indeed to understand the further detail about differential impact by gender. We need to find ways of improving our knowledge of the relationship between these types of intervention and cancer outcomes.

- Although it is beyond doubt that men have poorer cancer outcomes than women, it is crucial that we do not allow this starting point to lead us to treat men as a homogenous group. Earlier in the day's presentations, we had heard that male cancer outcomes vary considerably by factors such as age, socio-economic status and marital status. We also know from social research that men may fall into different groups by attitude or belief system. Before we begin to develop interventions aimed at better outcomes for "men", we need to understand the differences between groups of men much better. Only once we have done that can we target public health programmes and treatment services for optimum effect; indeed, there might even be a question about whether, if we could get the socio-economic targeting right in the first place, that would have a disproportionately beneficial impact on men.
- Do men actually know that they are at higher risk of most cancers? If not, why not? Is there a reticence within the NHS to draw this matter to public attention? If so, why is that? Are there ways in which we could test whether placing a greater emphasis on this simple point



would make any difference to male attitudes?

- Do we know why some non gender-specific, whole population interventions appear to work well with men and others not? If we could find a way of retrospectively examining this question, it might provide some insights. Is it possible that some whole population interventions do better with men because they are influencing women to talk to the men in their lives?
- Could we improve or change health education for boys in school to improve their help-seeking behaviour in adult life?
- Would it help if we could think of acceptable and practical ways to incentivise health improvement initiatives aimed at men?

### Research

- Can we identify the balance between the genetic basis for higher rates of cancer in men and those cancers that are related to lifestyle? We had heard that virtually all lifestyle-related risks occur more frequently in men but what proportion of the difference does that explain?
- How do we improve the collection and analysis of “staging data” (data which records the stage in the development of individual cancers at which diagnosis is made)? For most cancers, we still cannot say with any confidence

whether there tends to be a difference between the sexes in the stage at which they are diagnosed.

- The 2006 Men and Cancer Symposium had heard evidence that, for unexplained reasons, men and women seem sometimes to be offered different treatment options for the same cancers. There is very little published work on this issue and it may be an important part of the explanation for sex differences in outcome. On this point, the audience noted that new databases mean that it would now be easier than hitherto to examine patient data to see – for example - how often this happens and on what basis it varies (for example between one geographical area and another). Obviously this would not tell us why these decisions are being made but it would be a very useful starting point.
- Very little is known about whether health professionals tend to have different attitudes to male and female patients. This may make a difference to the kinds of services (including treatments – see above) that men and women receive. It may also have an impact on men’s and women’s experience of using health services. More research in this area could provide useful insights.
- Does compliance with treatment and care regimes vary between men and women and if so, could that be a factor in explaining differences in outcome? Is there – or could there be – research to examine this question?



### Health service delivery and cancer treatment

- Practitioners' experience suggests that there is a heightened awareness among medical staff that female patients may have an identifiable range of care and support needs during their treatment for cancer. This is partly because women's organisations have worked hard to improve public and professional sensitivity to women's experience of cancer. It was suggested however, that this may have been a double-edged sword; it may have added to the anxiety of some female patients and led to undue medicalisation of women's concerns. At the same time, we do undoubtedly need a similar level of understanding of the needs of male patients. In looking for that understanding it is important to avoid the pitfall of creating increased anxiety and medicalisation.
- How can we improve the way health services are delivered so that men are better engaged? In particular, how do we create opportunistic health interventions for men, so that we can make the most of those occasions when individual men are in contact with health professionals?

### What ideas do we need to test or pilot?

#### "Incentivisation"

Small scale local projects could test out whether incentivisation works. This approach could be tried with different groups of men,

either on prevention programmes or to encourage early diagnosis. An example might be a smoking cessation programme which uses urine cotinine testing to monitor participants and rewards those who quit successfully. Incentivisation could also be used to encourage healthcare providers to develop programmes to target men. An example of this might be rewards for GPs who institute a regular programme of inviting men into the surgery to discuss ways in which they could improve their health, or who are prepared to deliver health checks in outreach settings.

### Learning from the commercial world

There were two linked ideas in this suggestion. The first was to develop projects which work with, and/or learn from, marketing and advertising specialists in the commercial world. It seems likely that there is a body of expertise in that sector about how to communicate effectively with men. There has also been much more work in the health sector in recent years, on targeting men. The question was raised about whether it is now time to review the learning from those various initiatives and produce a best practice report.

### NHS Health Checks

The NHS Health Check programme currently includes only factors associated with increased risk of heart disease, stroke, kidney disease and diabetes. As a pilot, the Health Check could be adapted by some providers to include a discussion of cancer risk factors and questions about symptoms. The Health Check could also include a specific invitation to the patient to raise any other concerns

that he might have. Additionally, the pilot programme could perhaps include access to a post-appointment communication channel that would allow the man to reflect on whether he had asked everything he wanted to. If he hadn't, an easy route could be established to raise that concern with the healthcare provider (e.g. a dedicated e-mail address). It should be noted that this broad idea of opportunistic discussions of symptoms, was proposed in different forms by more than one of the discussion groups.

### Issuing invitations

The NHS Health Check programme (see above) offers one opportunity to talk to men about cancer symptoms. An alternative would be to pilot a programme in which primary care records are used to identify men who are potentially at higher risk (e.g. by age or postcode) and who have not seen their GP for some time. Men meeting the criteria could then be contacted and invited to attend their GP surgery for a check up.

### Holding CCGs to account

It isn't immediately obvious how this could be constructed as a pilot project but it would be worth considering how to hold CCGs formally to account for their responsibility under the Equality Act to act directly to reduce gender inequalities in cancer outcomes. Are there routes to do this via the inspectorate bodies or using legal channels?

### Malignant melanoma

The cancer for which we currently have the strongest evidence base in relation to poorer outcomes for men is malignant melanoma skin

cancer. As we had seen earlier, men are less likely to develop melanoma but more likely to die from it. It seems possible that women have made a more committed response than men to health promotion messages over recent years about safety in the sun. Because there is such a strong evidence base, there is a very good case for a pilot project targeting men with male-specific messages about prevention and/or symptom awareness.

### Understanding how health professionals interact with male patients

There is little knowledge about the experiences and perceptions of health professionals with regard to men's use of services. A research project was suggested that would explore with health professionals what they consider are the barriers to male help-seeking. It was also suggested that such a research project could explore whether health professionals respond differently to male and female patients.

### Gender-specific information materials

A randomised controlled trial could be used to investigate whether gender-specific information materials could make a difference – for example – to participation in the National Bowel Cancer Screening Programme. Materials written specifically for men, could be compared for outcome, against materials written specifically for women and against the generic materials now being used for people of either sex.

### "Giving permission"

It has been suggested that men may be more likely to seek help for health concerns if they

are given “permission” to do so – for example, by encouragement from friends or relatives. Is there a way that a pilot programme could be developed around the idea of “permission”, without implicitly giving responsibility for the health of men to a third party (often, a wife or female partner).

### Partnerships with employers

It is often speculated that men may have more difficulty than women in getting time off work or attending their GP during the working week. This suggestion was for a pilot project with a large employer, in which male employees would be actively encouraged to visit their GP with troubling symptoms for which they had not previously sought help. The employer would assist by promoting the scheme, “giving permission” (see above) for the employee to take time off, and allowing him to make the visit during working hours. There was support from other discussion groups for working with employers in a more general way to deliver cancer prevention messages and disseminate information about symptoms.

### Co-morbidities

Although rather non-specific, there was support for a research-based project to determine whether co-morbidities have an impact on diagnosis, care pathways or cancer outcomes in men. It was also suggested that questions could be asked about cancer symptoms in men attending health care appointments for – for example – CVD or COPD. Similarly, interventions on alcohol could stress the direct links between alcohol and cancer; and links between alcohol and cancer via increased risk of obesity.

### Fathers and smoking

Interventions during pregnancy have proved successful in supporting women to give up smoking. During this period, mothers-to-be have a strong incentive to quit. It would be worth piloting parallel programmes targeted at fathers-to-be. Similarly, fathers might respond to pilot programmes aimed at discouraging men from smoking in enclosed spaces when children are present, most particularly programmes aimed at discouraging smoking in cars. This would benefit the health of children and might help men move towards giving up smoking altogether.

### What should be our policy priorities?

The purpose of the final session of the day was to identify the policy ideas that carried the greatest weight among the expert participants. The process began with the reporting of all the policy ideas emerging from the day’s discussions. These are listed below in summary. Once all the policy ideas had been put forward, participants agreed to group together those that were similar, where it was possible to do that. A debate followed by a voting process was then used to narrow the original list down to a group that carried the most support. That group is reported at the end of this section, although it was recognised in the day that this was a fairly blunt process and did not take account of the relative achievability of some of the proposals.

### Summary of all policy ideas proposed

A number in brackets at the end of the idea denotes the number of times it was proposed by different groups (no number means that the idea was proposed once):

- All cancer datasets always to be published and analysed in gender-disaggregated form.
- Priority in cancer policy development to be given to cancer prevention – routinely using a gender-sensitive approach to information provision. (2)
- Stronger government links with the third sector on cancer policy development (including a wider range of third sector organisations than those working solely on cancer).
- That GP surgeries should become friendly, accessible and informative places that have flexible opening times, encourage community use and take account of male attitudes and beliefs. (2)
- Routine analysis by gender of data relating to cancer risk factors.
- Better segmentation of the delivery of health improvement programmes (e.g. by social class, educational attainment, cultural attitude).
- The NHS to make data available for research even when it (the NHS) considers that the data is not of good enough standard.
- Produce better data about stage of diagnosis of cancer.
- Male-specific outcome measures to be included in the NHS Outcomes Framework and Public Health Outcomes Framework.
- Include boys and/or gay men in the HPV vaccination programme. (4)
- Ensure that gender issues are included in training programmes for health professionals of all kinds.
- Greater regulation in relation to lifestyle risk factors (e.g. plain packaging of cigarettes, unit-related pricing for alcoholic drinks, regulating smoking in cars). (2)
- Use the QOF system to incentivise GPs to address male health issues. Some measures suitable for this approach could be very simple indeed, such as recording the weight/BMI of a fixed proportion of male patients. Others might be more complicated and more difficult to resource, such as an annual health check for men over a certain age. (3)
- Allocate research funding to developing a better understanding of those cancers where the cause remains unknown.
- More accurate quantification of the balance between lifestyle-related causes of cancer and genetic/biological causes of cancer, so that we can allocate funding more effectively

- A strong, clear national campaign promoting physical activity to men with consideration given to ways of incentivising participation in exercise.
- All NHS organisations to have a clear strategy on improved access to services for male service users.
- Identify good practice in working with men and actively roll that out across more NHS organisations.

#### Policy ideas that had the most support

Once the policy ideas above had been grouped together (where that was possible), the audience was asked to rank them in order of priority. The ideas that carried the most support among the audience are set out below:

1. That a wider range of cancer data should be collected. That these data should routinely be published in gender-disaggregated form and made more easily accessible to policy makers and practitioners.
2. That GP surgeries and other primary care providers should be required to make more effort to reach out to men, especially those men in particular sub-groups who are known to be poorer users of services.
3. That the HPV vaccination programme should be extended to include boys.
4. That there should be greater regulation of lifestyle-related risk factors such as smoking, alcohol intake and unhealthy foodstuffs.
5. That we should incentivise health providers to improve services for men and that we should consider health improvement interventions that incentivise men to participate.

## Appendix 1

### Attendees at the Men and Cancer Expert Roundtable

Ian Ainscough Macmillan Cancer Information & Support Centre Manager, Salford Royal NHS Foundation Trust	Nick Clarke Assistant Researcher, Centre for Men's Health, Institute of Technology, Carlow, Ireland	Elizabeth Lee Consultant in Public Health – Avon, Somerst and Wiltshire Cancer Services	Susie Richardson Macmillan Cancer Support
Hilary Atkinson Complex Case Manager, Macmillan Cancer Support	Louise De Winter CEO, Urology Foundation	Dr Gergios Lyratzopoulos Cambridge Centre for Health Services Research	Prof Steve Robertson Co-Director Centre for Men's Health, Leeds Metropolitan University and Editor-in-Chief, IJMH
James Austin Early Diagnosis Programme Manager, Macmillan Cancer Support	Kathy Elliott National Lead - prevention, early diagnosis and inequalities, National Cancer Action Team	Prof Ellis McCaughan Professor in Cancer Care, Institute of Nursing Research, University of Ulster	Anne Ruglys Deputy Director, Government & Policy Affairs, Sanofi Pasteur MSD
Peter Baker Men's Health Consultant	Tim Elliott Cancer Screening and Male Cancers, Department of Health	Gerry McElwee Cancer Focus Northern Ireland	Joanne Rule Co-Chair, National Cancer Equality Initiative
Susan Barber Project Manager, European Men's Health Forum	Alan Ferguson Network Project Manager, National Awareness and Early Diagnosis Initiative	Barbara McLaughlan National Cancer Policy Lead, Novartis	Caroline Shockledge Manchester Bowel Cancer Screening Health Improvement Team
Mike Birtwistle Managing Director, MHP Health Mandate	Jacqueline Goodchild Treatment and Healthcare Workforce Programme Manager, Macmillan Cancer Support	Clare Moynihan Senior Research Fellow & Research Associate, Institute for Cancer Research	Rachel Thompson Deputy Head of Science, World Cancer Research Fund International
Gareth Brewerton Patient Representative	Peter Greenhouse Consultant in Sexual Health, Bristol Sexual Health Centre	Sara Osborne Head of Policy, Cancer Research UK	Paul Trevatt Nursing Director of North East London Cancer Network
Dr Nigel Carter CEO, British Dental Health Foundation	Karen Groot Head of Programmes, National Cancer Research Institute	Prof Sarah Payne School for Policy Studies, Bristol University	Prof Alan White Co-Director Centre for Men's Health, Leeds Metropolitan University and Chair, Men's Health Forum
Caroline Cerny Skin Cancer Lead, Cancer Research UK	Prof Kate Hunt Gender and Health Unit, Medical Research Council	Prof David Phillips Professor of Environmental Carcinogenesis, King's College London	Martin Whitehead National Policy and Access Manager (Oncology), Bristol-Myers Squibb
Fiona Charman Senior Market Access Manager, Sanofi Pasteur MSD	Johnathan K. Joffe Medical Oncologist, Calderdale and Huddersfield NHS Foundation Trust	Sarah Porch Director of Services, Bowel Cancer UK	David Wilkins Policy Officer, Men's Health Forum
Dr Frank Chinegwundoh Urologist. Chair of Cancer Black Care	Balwinder Kaur Equality & Inclusion Manager, National Cancer Equality Initiative	Rebecca Porta CEO, Orchid	Richard Winder NHS Cancer Screening Programmes
Suzi Chung Equality Project Manager, National Cancer Action Team		Jamie Rae CEO, Throat Cancer Foundation	
		Noel Richardson Director, Centre for Men's Health, Institute of Technology, Carlow, Ireland	

## Appendix 2

### The Men and Cancer Expert Roundtable Agenda

29 January 2013

The King's Fund, 11–13 Cavendish Square, London W1G 0AN

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#### Morning programme

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9:30	Registration and coffee
10:00	Welcome from the Chairs <ul style="list-style-type: none"> <li>• Professor Alan White, Centre for Men's Health, Leeds Metropolitan University and Chair, Men's Health Forum</li> <li>• Joanne Rule, Co-Chair of the National Cancer Equality Initiative</li> </ul>
10:10	Men and cancer inequalities – a short history Professor Alan White
10:25	Why the excess burden of cancer in men? An overview Dr Noel Richardson, Director, and Nick Clarke, Assistant Researcher. Centre for Men's Health, Institute of Technology, Carlow, Ireland
11:10	Break
11:30	Do men present late or don't they? What we know and what we still need to know Kathy Elliott, National Lead - prevention, early diagnosis and inequalities National Cancer Action Team
12:15	Are men biologically at greater risk? Professor David Phillips Professor of Environmental Carcinogenesis, King's College London
1:00	Lunch
1:45	Are bugs to blame? The role of infection Mr Peter Greenhouse, FRCOG, Consultant in Sexual Health, Bristol Sexual Health Centre and Weston Integrated Sexual Health Centre
2:30	Establishing priorities for future work
3:20	Plenary discussion to summarise key points and consider next steps
4:00	Close

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## Appendix 3

### Speaker Biographies

#### Nick Clarke

Nicholas Clarke is a researcher with the National Centre for Men's Health (NCMH), IT Carlow and principal author of the report on the excess burden of cancer in men in the Republic of Ireland. He joined the National Cancer Registry in 2012 as an Irish Cancer Society PhD Research Scholar. His PhD, conducted through the National Cancer Registry and registered with the Department of Epidemiology and Public Health at University College Cork (UCC), is focused on participation in colorectal cancer screening in Ireland, with particular emphasis on male uptake. His previous research includes suicide prevention in young men, the European Commission Report on the state of men's health in the EU, Traveller men's health and male perpetrators of domestic abuse. He was also research co-ordinator for the Men's Development Network, Ireland's national men's organisation. Nick obtained the first public health-based scholarship from the Irish Cancer Society in 2011.

#### Kathy Elliott

Kathy Elliott is the national lead for cancer prevention, early diagnosis and inequalities, working with the National Cancer Action Team. She is a Public Health Consultant who has worked at strategic and operational levels delivering national, regional and local health services. Her current role includes leading work with general practice and primary care. Kathy has held Director-level posts nationally, in PCTs, partnership with Local Authorities, and previously was Head of Finance and Performance in NHS London. Through these roles she has developed particular expertise in health inequalities, preventive health programmes, delivering public health programmes through partnerships and the

NHS, finance and performance management, and clinical governance. Kathy is an Honorary Fellow of the Faculty of Public Health.

#### Peter Greenhouse

Peter Greenhouse qualified in 1979 from Cambridge, and trained in Venereology and Gynaecology with the aim of bringing the two subjects together to improve women's health. He set up the UK's first integrated sexual health centre in Ipswich in 1991, providing holistic care for contraception and sexually transmitted infections under one roof. After moving to Bristol in 1999, he won large Department of Health capital grants to redesign and rebuild sexual health services there and in Weston, which won the Terrence Higgins Trust's 'Sex Factor' Award in 2007. He lectures internationally on all aspects of women's sexual health, specialising in chlamydia, HPV, herpes and hormonal interactions with genital infections, and has been the principal postgraduate lecturer on pelvic infection for the British Society for Sexual Health and HIV since 1994 and the RCOG since 2009. He has chaired the BASHH media committee since 2010 and was responsible for running the successful campaign to introduce quadrivalent HPV vaccine into the national schools cervical cancer prevention programme. Widely published as a medical photographer, he is also medical advisor to the Ectopic Pregnancy Trust and a member of the Expert Advisory Group on STI of the European Society for Contraception. He also works regularly as a script advisor for several British television sex education programmes.

#### David Phillips

David H. Phillips is Professor of Environmental Carcinogenesis at King's College London. For

the past 30 years he has been conducting research into mechanisms of cancer induction and environmental causes of cancer, with emphasis on chemicals. His experimental approach has been to investigate, at the molecular level, what carcinogens do to cells and what cells do to carcinogens, and to develop methods for monitoring human exposure to carcinogens. His work has focused on carcinogens present in tobacco smoke, air pollution, cooked food, and some man-made and natural medicines. He is an expert on interactions of carcinogens with DNA, which are critical events in the carcinogenic process. He has served on a number of international advisory panels on cancer and is currently chairman of the government advisory Committee on Carcinogenicity.

### Noel Richardson

Dr Noel Richardson has extensive experience in the area of men's health at a research, policy and advocacy level. He is principal author of the first ever National Policy on men's health, which was published in Ireland in 2009. He has worked as a senior researcher and policy advisor in men's health at the Department of Health in Ireland since 2002. He is also co-author of the first European Union report on men's health, published in 2011. He completed a doctoral thesis on men's health in 2007 and has a number of peer-reviewed and other publications in men's health. He is director of the Centre for Men's Health at the Institute of Technology Carlow in Ireland, with responsibility for men's health research and training. He has presented at international conferences on men's health and is a board member of the Men's Health Forum in Ireland and the European Men's Health Forum.

### Joanne Rule

Joanne Rule is co-chair of the National Cancer Equality Initiative (NCEI) set up to bring together stakeholders from the professions, voluntary sector, academia, and equality groups. NCEI works to develop research proposals on cancer inequalities, test interventions, and advise on the development of wider policy. The role of the NCEI is to advise the National Cancer Director and Ministers on action to reduce inequalities set out in *Improving Outcomes: A Strategy for Cancer*. Joanne has more than 20 years' experience of the health and social care sector. She was CEO of the patient charity Cancerbackup for seven years before its successful merger with Macmillan Cancer Support. Joanne now works as an independent coach and consultant in the health sector.

### Alan White

Professor Alan White PhD MSc BSc (Hons) RN, is the Founder and Co-director of the Centre for Men's Health, Leeds Metropolitan University and Chair of the Board of Trustees for the Men's Health Forum (England & Wales). He has recently headed up an international team of academics for *The State of Men's Health in Europe Report* for the European Commission. He was the lead author on the CRUK/NCIN *Excess Burden of Cancer in Men* report and was a member of the National Cancer Equality Initiative Advisory Group. His other research includes the evaluation of *Premier League Health Initiative*, which is being run through the Football Premier League in England; *Tackling Men's Health* with the Leeds Rhinos; and the on-going evaluation of the Rugby League Mental Health programme.

## About the Author

### David Wilkins

David Wilkins has worked for the Men's Health Forum since 2002. He was responsible for the MHF's overarching policy document *Getting It Sorted* and has written policy papers on several specific aspects of male health, including men's mental health; men's sexual health; male obesity; male health in the workplace; and cancer in men. In recent years he has edited the *Gender and Access to Health Services Study* for the Department of Health and, with Erick Savoye, *Men's health around the world: a review of policy and progress across 11 countries*. In the past four years he has written three national level reports on different aspects of men's mental health.

David has managed a number of practical projects aimed at improving men's physical and mental health, both for the Men's Health Forum and in the NHS. Most recently, he

led a three year project, funded by the Department of Health, which aimed to help redress the imbalance in uptake between men and women in the National Bowel Cancer Screening Programme. He has been a member of the National Cancer Equality Initiative since its inception in 2008 and, also in the field of cancer, has also served on the National Awareness and Early Diagnosis Initiative Forum. He represents the "male health interest" on a number of other national and regional organisations concerned with the development of health policy and practice.

David was a community worker for several years. Immediately prior to his present appointment he worked for 11 years in the NHS, for the last three years of which he was a Lecturer/Practitioner in Health Promotion on a joint NHS/university appointment.



David Wilkins

## Appendix 4

Cancer Statistic Report: Excess Cancer Burden in Men, January 2013

# EXCESS CANCER BURDEN IN MEN

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January 2013

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## INTRODUCTION

In general, men are at significantly greater risk of both developing and dying from nearly all of the common cancers that occur in both sexes (with the exception of breast cancer).<sup>1-6</sup>

The current overall burden of cancer among males in the UK, and an outline of the extent

of the differences between the sexes, are presented here.

All figures and calculations in this report are based on data prepared for<sup>7</sup> or compiled by Cancer Research UK's Statistical Information Team<sup>8</sup> using official national sources.<sup>9-16</sup>

More on Cancer Inequalities

- Men's Cancer Briefing 2013 (report)
- Cancer Incidence and Survival by Major Ethnic Group, England, 2002-2006 (report)

Both are available from [cruk.org/cancerstats](http://cruk.org/cancerstats)

2

## INCIDENCE AND MORTALITY

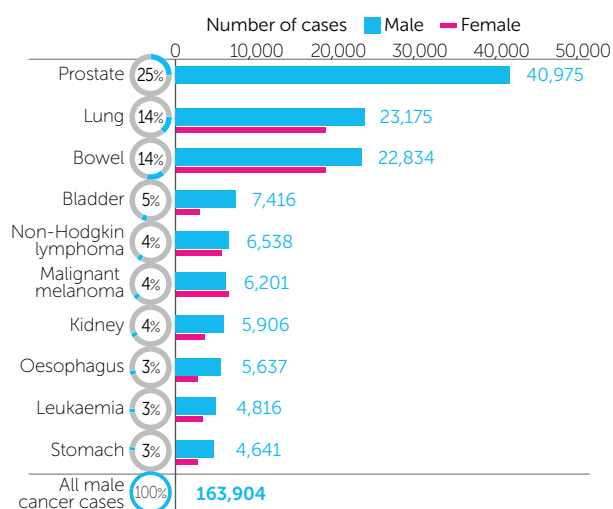
In 2010, there were 163,904 new cases of cancer diagnosed in males in the UK excluding non-melanoma skin cancer (NMSC) compared with 160,675 cases in females. The corresponding European age-standardised incidence rates for 2010 were 425.5 per 100,000 males and 374.0 per 100,000 females (incidence rate ratio equals 1.14, or 14% higher risk of developing cancer for men). Although the number of cases in males and females is similar, the rates are higher in males because there are more older women in the population.

There were 82,481 cancer deaths in males and 74,794 cancer deaths in females in the UK in 2010, accounting for 31% of total male mortality and 26% of total female mortality. As with the incidence figures, when translated into European age-standardised rates, the contrast between the sexes is more marked; the death rates in 2010 were 201.6 per 100,000 in males and 146.8 per 100,000 in females, respectively (mortality rate ratio equals 1.37 or 37% higher risk

of death from cancer for men). This difference results from a combination of different life expectancy (as for incidence) and an increased likelihood of males having more fatal cancers than females.

The European age-standardised incidence rate for all cancers combined (excluding NMSC) in Great Britain increased by 22% in males during the period 1975-1977 to 2008-2010, from 351.8 per 100,000 to 429.8 per 100,000. For the same period, however, the mortality rate (for the UK and including NMSC) decreased by 27% from 280.7 per 100,000 in 1975-1977 to 205.0 per 100,000 in 2008-2010. For females, the figures rose by 42% from 263.3 to 375.1 per 100,000 over the same period for incidence, and for mortality they decreased by 16% from 176.5 to 148.7 per 100,000 over the same period. The female trends are mostly likely due to the high incidence of breast cancer, and that lung cancer incidence and mortality is still increasing for females.

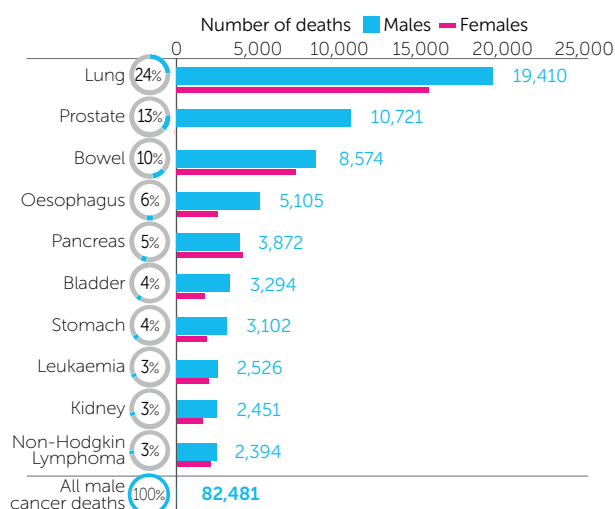
Figure 1: Most Common Cancers in Men



Notes

10 most commonly diagnosed cancers in males, percentages (rounded) of all cancer cases excluding NMSC (C00-97 excl. C44), UK, 2010. Bowel excludes anus (C18-20). 35,765 (22%) cases diagnosed in men were cancers of other sites.

Figure 2: Most Common Causes of Male Cancer Death



Notes

10 most common causes of cancer death in males, percentages (rounded) of all cancer deaths including NMSC (C00-97), UK, 2010. Bowel excludes anus (C18-20). 21,032 (25%) deaths in men were from cancers of other sites.

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The difference between the incidence and mortality trends is because despite more people being diagnosed with cancer a combination of earlier diagnosis, improved diagnostic techniques and advances in care and treatment means that more people are surviving their cancers than previously.<sup>7</sup>

Of the different types of cancer experienced by males in the UK, prostate cancer is the most common (Figure 1) but lung cancer is still the greatest contributor to cancer deaths in

males (Figure 2). These two cancers, along with bowel cancer, jointly account for over half (53%) of cancer cases in males and nearly half (47%) of all cancer deaths and, understandably, have received most attention from policy makers; however, all the other cancers which comprise the other 53% of deaths in males should not be disregarded.

Sex differences exist in other sites, such as oral cancer and mesothelioma,<sup>8</sup> but these are not discussed in this report.

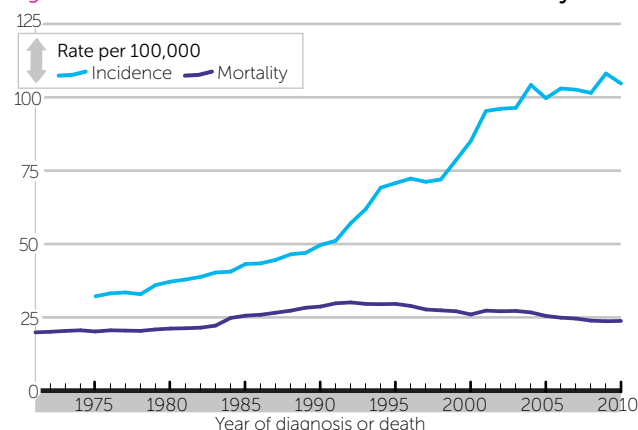
## 3.1 Prostate Cancer

## MALE-SPECIFIC CANCERS

The introduction of Prostate Specific Antigen (PSA) testing combined with the increasingly ageing population caused a rapid increase in the diagnosis of prostate cancer, with incidence rates rising from 32.9 per 100,000 in 1975-1977 to 104.8 per 100,000 in 2008-2010 in Great Britain.

In line with increasing incidence rates, prostate cancer mortality rates have also increased slightly in the UK since the early 1970s, although this includes both an increase and decrease in rates during that time. Mortality rates were fairly stable (around 20 deaths per 100,000 males) during the 1970s, but increased during the 1980s to reach a peak at around 30 per 100,000 males in the early 1990s and have since fallen by 18% (to around 24 deaths per 100,000 males in 2008-2010) (Figure 3).

Figure 3: Prostate Cancer Incidence and Mortality



Notes Prostate cancer (C61): European age-standardised incidence rates, Great Britain, 1975-2010 and European age-standardised mortality rates, UK, 1971-2010.

## 3.2 Testicular Cancer

There were 2,286 cases of testicular cancer in the UK in 2010. Incidence rates increased steadily from 3.3 per 100,000 in 1975-1977 to 7.3 per 100,000 males in Great Britain in 2008-2010. Mortality rates for testicular cancer decreased from 1.1 per 100,000 males in the UK in the 1970s until 2005-2007 where they stabilised at 0.2 per 100,000 males. There were 75 deaths from testicular cancer in the UK in 2010.

## 3.3 Penile Cancer

Penile cancer is relatively rare, with 515 cases and 92 deaths in 2010 in the UK. More than 80% of cases and more than 90% of deaths occurred in men aged 50 years and over.

## 4

## MORTALITY RATE RATIOS (MRRs)

**Deaths from NMSC are excluded from these mortality rate ratios (MRR).** Unlike most cancer mortality statistics, the 320 male and 226 female deaths in 2010 are excluded for consistency with the incidence rate ratios (IRR) (Section 5).

Rate ratios of the mortality European age-standardised rates for males and females for all ages, and truncated into two age groups are shown in Table 1 and Figure 4.

All of the rate ratios were found to be statistically significant at the 95% confidence level except for the rate ratio for 15-64 year olds when NMSC and lung cancer were excluded from all cancers. The MRR shows a significantly higher rate of cancer death (1.37) in men of all ages. This ratio is lower in the 15-64 age range (1.06) but is substantially larger (1.55) for those men aged 65 and over.

The mortality rate for lung cancer is substantially higher in men than women because of differences in smoking prevalence in the two sexes, with men always having higher use, although the gap between the numbers of smokers has reduced and almost disappeared (Figure 5). The MRR calculated after excluding lung cancer (to examine the influence on the burden of cancer in the two sexes after excluding the main cancer caused by smoking) shows the ratio (for all ages) reduces slightly to 1.33, with corresponding reductions to 1.01 (non significant) for 15-64 year olds and 1.52 for those aged 65 and over. This could suggest that younger males have higher overall cancer mortality because of their excess rate of lung cancer (Table 1 and Figure 4).

The increased risk in mortality rates for males compared with females is seen across a broad range of cancer sites (Table 1).



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**Table 1: Male-to-Female Mortality Rate Ratios (MRRs)**

Cancer Site	ICD-10 code/s	Mortality Rate Ratios		
		All ages	15-64	65+
All cancers excl. NMSC	C00-97 excl. C44	1.37	1.06	1.55
All cancers excl. NMSC and lung	C00-97 excl. C44, C33-34	1.33	1.01	1.52
All cancers excl. NMSC, breast and sex-specific	C00-97 excl. C44, C50, C51-58, C60-63	1.67	1.58	1.71
All cancers excl. NMSC, breast, lung and sex-specific	C00-C97 excl. C44, C33-34, C50, C51-58, C60-63	1.72	1.72	1.73
Bladder	C67	2.89	2.08	3.09
Bowel	C18-20	1.65	1.58	1.67
Brain and CNS	C70-72	1.58	1.61	1.56
Kidney	C64-66, C68	2.01	2.30	1.87
Leukaemia	C91-95	1.70	1.64	1.77
Liver	C22	1.92	2.06	1.86
Lung	C33-34	1.53	1.27	1.66
Malignant melanoma	C43	1.62	1.31	1.96
Myeloma	C90	1.42	1.46	1.41
Non-Hodgkin lymphoma	C82-85	1.54	1.64	1.49
Oesophagus	C15	2.89	3.89	2.53
Pancreas	C25	1.27	1.45	1.20
Stomach	C16	2.21	1.86	2.36

**Notes** Mortality rate ratios are European age-standardised, of male to female cancer mortality (excluding NMSC), UK, 2010.

All of the above mortality rate ratios were statistically significant at the 95% confidence level except "All cancers excl. NMSC and lung" (C00-97 excl. C44 and C33-34) in 15-64 year olds.

Bowel excludes anus (C18-20).

Brain and CNS includes all invasive cancers of the brain and central nervous system only.

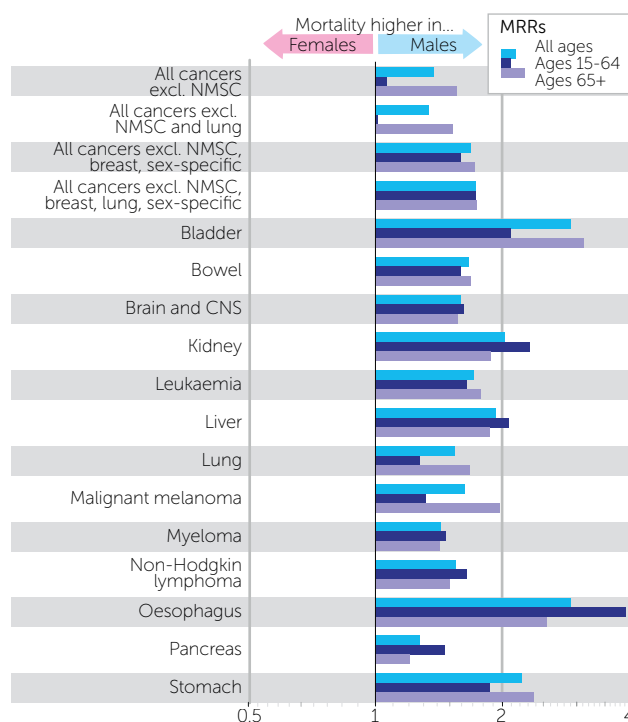
When MRRs are calculated excluding breast and sex-specific cancers, a different picture emerges, with 58% higher mortality rates in men aged 15-64 than in women for cancers which may affect the sexes equally. Thus, a greater effect seems to be mainly because many cancer deaths that occur in younger women are for breast and genital organs (36% of cancer deaths in those aged 15-64; and 49% in those aged 35-44; [Table 2](#)). In contrast, there are relatively few deaths from a sex-specific cause for males in younger age groups (5% deaths in ages 15-64 are for male-specific cancers).

**Table 2: Deaths From Breast or Sex-Specific Cancers**

	Males		Females	
	All ages	%	All ages	%
1-14 years	-	0.0%	-	0.0%
15-64 years	837	4.6%	6,190	35.6%
65+ years	10,141	15.8%	13,032	22.8%
35-44 years	21	1.9%	776	49.2%

**Notes** Total numbers of deaths from breast or sex-specific cancers and the percentage of these cancers out of all cancers (excluding NMSC), by age group, UK, 2010.

**Figure 4: Male-to-Female Mortality Rate Ratios (MRRs)**



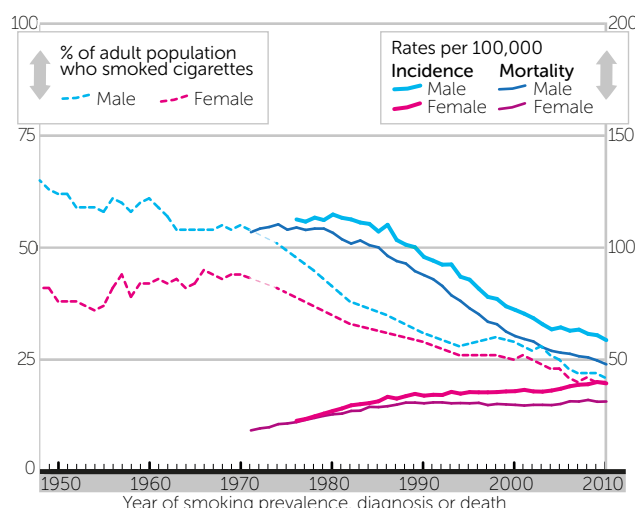
**Notes** Mortality rate ratios are European age-standardised, of male to female cancer mortality (excluding NMSC), UK, 2010.

All of the above mortality rate ratios were statistically significant at the 95% confidence level except "All cancers excl. NMSC and lung" (C00-97 excl. C44 and C33-34) in 15-64 year olds.

Bowel excludes anus (C18-20).

Brain and CNS includes all invasive cancers of the brain and central nervous system only.

**Figure 5: Smoking and Lung Cancer Trends**



**Notes** Smoking prevalence, Great Britain, 1948-2010 (smoking data weighted after 1998).

Lung cancer (C33-34): European age-standardised incidence rates, Great Britain 1975-2010, and European age-standardised mortality rates, UK, 1971-2010.

Created by Cancer Research UK's Statistical Information Team from multiple sources. [9-15,17-18](#)



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The age-standardised incidence rate ratios (IRRs) show that males have a higher risk of getting cancer than females (IRR 1.14), for all ages (Table 3 and Figure 6). This ratio is larger when breast and sex-specific cancers are excluded (IRR 1.56). In contrast, males aged 15-64 have a lower risk of developing cancer (IRR 0.80) and this group also has a lower risk when lung cancer is excluded (IRR 0.77). However, males in this age group have an increased risk when cancers of the breast and genital organs are excluded (IRR 1.39), again reflecting the

## INCIDENCE RATE RATIOS (IRRs)

predominance of breast and sex-specific cancers in younger women.

Males have a higher risk for most individual cancers except for malignant melanoma (where they have the same risk as females across all ages combined and for young males, where they have a significantly lower risk of 0.80).

Table 3: Male-to-Female Incidence Rate Ratios (IRRs)

Cancer Site	ICD-10 code/s	Incidence Rate Ratios		
		All ages	15-64	65+
All cancers excl. NMSC	C00-97 excl C44	1.14	0.80	1.54
All cancers excl. NMSC and lung	C00-97 excl C44, C33-34	1.10	0.77	1.53
All cancers excl. NMSC, breast and sex-specific	C00-97 excl C44, C50, C51-58, C60-63	1.56	1.39	1.71
All cancers excl. NMSC, breast, lung and sex-specific	C00-C97 excl C44, C33-34, C50, C51-58, C60-63	1.59	1.42	1.75
Bladder	C67	3.29	2.74	3.52
Bowel	C18-20	1.58	1.46	1.65
Brain and CNS	C70-72	1.50	1.49	1.62
Kidney	C64-66, C68	1.87	1.87	1.91
Leukaemia	C91-95	1.65	1.58	1.81
Liver	C22	2.23	2.46	2.10
Lung	C33-34	1.46	1.21	1.60
Malignant melanoma	C43	0.99	0.80	1.47
Myeloma	C90	1.51	1.39	1.59
Non-Hodgkin lymphoma	C82-85	1.36	1.35	1.37
Oesophagus	C15	2.71	3.52	2.34
Pancreas	C25	1.27	1.40	1.21
Stomach	C16	2.28	1.97	2.44

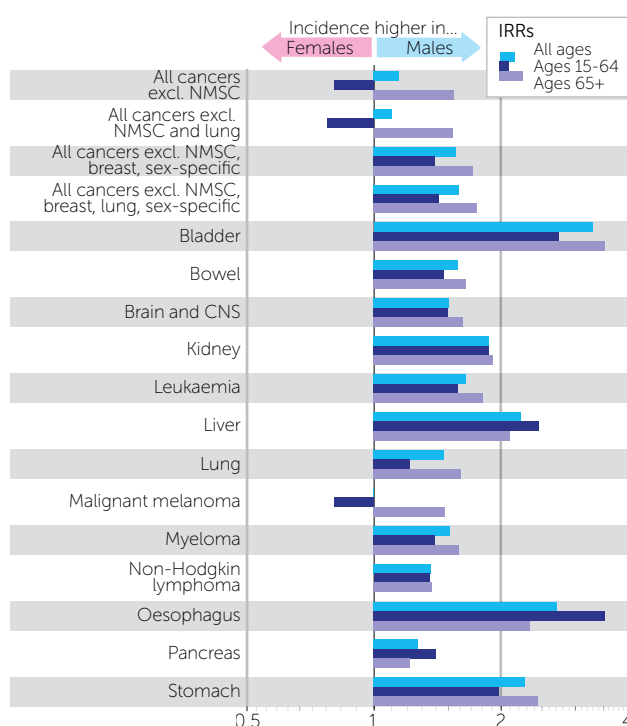
Notes Incidence rate ratios are European age-standardised, of male to female cancer incidence (excluding NMSC), UK, 2010.

All of the above incidence rate ratios were statistically significant at the 95% confidence level except "Malignant melanoma" (C43) at all ages.

Bowel excludes anus (C18-20).

Brain and CNS includes all invasive cancers of the brain and central nervous system only.

Figure 6: Male-to-Female Incidence Rate Ratios (IRRs)



Notes Incidence rate ratios are European age-standardised, of male to female cancer incidence (excluding NMSC), UK, 2010.

All of the above incidence rate ratios were statistically significant at the 95% confidence level except "Malignant melanoma" (C43) at all ages.

Bowel excludes anus (C18-20).

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## LIFETIME RISK

The lifetime risk (Table 4) of a new born baby in 2010 being diagnosed with any form of cancer (excluding NMSC) during their lifetime is 44% for baby boys and 40% for baby girls (or more than 1 in 3 for both sexes). When lung cancer is excluded as well as NSMC, the difference in lifetime risk remains roughly the same, but there is a wider gap when breast and sex-specific cancers are removed from the calculation (35% for males, 26% for females). When examining the lifetime risk figures across those cancers which can occur in both sexes, males show a higher lifetime risk for most cancers except malignant melanoma and pancreas, and only slightly higher risk for myeloma and brain and CNS (Table 4).

Table 4: Risk of Being Diagnosed with Cancer

Cancer Site	ICD-10 code/s	By age 65 %		Lifetime risk %		1 in X	
		Male	Female	Male	Female	Male	Female
All cancers excl. NMSC C00-97 excl. C44		12.2	14.9	43.9	40.1	3	3
All cancers excl. NMSC and lung cancer C00-97 excl. C44, C33-C34		10.9	13.8	37.8	35.5	3	3
All cancers ex. NMSC, breast and sex-specific C00-97 excl. C44 C50, C51-58, C60-63		9.3	6.9	34.5	25.8	3	4
All cancers ex. NMSC, breast, lung and sex-specific C00-97 excl. C44, C33-34, C50, C51-58, C60-63		8.0	5.8	27.8	20.6	4	5
Bladder	C67	0.3	0.1	2.6	0.9	40	107
Bowel	C18-20	1.6	1.1	7.2	5.4	14	19
Brain and CNS	C70-72	0.4	0.3	0.8	0.6	124	170
Kidney	C64-66, C68	0.6	0.3	1.8	1.1	56	90
Leukaemia	C91-95	0.5	0.3	1.5	1.0	66	96
Liver	C22	0.2	0.1	0.9	0.5	117	214
Lung	C33-34	1.4	1.2	7.6	5.8	14	18
Malignant melanoma	C43	0.7	0.9	1.8	1.8	55	56
Myeloma	C90	0.2	0.1	0.8	0.7	119	154
Non-Hodgkin lymphoma C82-85		0.7	0.5	2.0	1.7	51	61
Oesophagus	C15	0.5	0.1	1.8	0.9	56	110
Pancreas	C25	0.3	0.2	1.4	1.4	73	74
Prostate	C61	2.5		13.2		8	
Stomach	C16	0.3	0.1	1.6	0.8	64	120

## Notes

Risk for newborn babies born in 2010 being diagnosed with selected cancers by age 65 and over a lifetime, UK, 2010.

Figures for liver cancer in females are based on 2008-2010 data, due to having fewer than 2,000 cases.

Myeloma, pancreas and prostate cancer figures have been calculated using the Current Probability method. The AMP method was used for all other cancer sites.<sup>19,20</sup>

Bowel excludes anus (C18-20).

Brain and CNS includes all invasive cancers of the brain and central nervous system only.

## 7

## SURVIVAL

Inequalities between the sexes are also present for cancer survival data.<sup>21</sup> However, the pattern of survival differences between the sexes in England and Wales is less clear (Table 5). For many cancers, males have poorer survival than females, but for several cancers, there is no difference between the sexes, and for a few types of cancer, males have better survival than females. The largest inequality is for malignant melanoma, with males having considerably lower survival than females (11% lower ten-year survival). In contrast, however, males have substantially higher survival from bladder cancer (around 10%) than females (Table 5).

Overall, for all cancers combined, 39% of men are expected to survive their cancer for at least 10 years after their diagnosis compared with 51% of women. However, this survival gap is likely to be driven by there being around 9,000<sup>8</sup> more females getting breast cancer with a good prognosis (10-year survival of 77%) than there are males getting prostate cancer (with 10-year survival of 69%).<sup>7</sup>

Table 5: Survival (%) for Selected Common Cancers

Cancer Site	ICD-10 code/s	1 Year, 2005-2009		5 Year 2005-2009		10 Year 2007	
		Male	Female	Male	Female	Male	Female
Bladder	C67	78.4	68.2	58.2	50.2	51.5	42.4
Brain	C71	41.5	41.5	14.5	16.1	9.3	9.6
Colon	C18	73.0	72.2	54.4	55.1	50.1	50.8
Kidney	C64-66, C68	71.5	71.4	53.3	54.8	43.0	44.3
Leukaemia	C91-95	64.5	63.5	44.0	44.4	32.9	33.6
Lung	C33-34	29.4	33.0	7.8	9.3	4.9	5.9
Malignant melanoma	C43	95.7	97.7	83.6	91.6	76.7	88.0
Myeloma	C90	70.4	72.3	37.1	37.1	19.0	14.9
Non-Hodgkin lymphoma	C82-85	76.0	78.9	61.5	65.7	50.3	51.3
Oesophagus	C15	40.2	39.9	13.4	12.6	10.2	9.7
Pancreas	C25	17.4	19.1	3.6	3.8	2.9	2.7
Prostate	C61	93.5		81.4		68.5	
Rectum	C19-20, C21.8	78.8	78.8	54.6	57.5	47.3	52.1
Stomach	C16	42.2	41.7	17.7	17.5	13.7	13.1
All cancers combined						39.3	51.0

## Notes

One- and five-year age-standardised relative survival for adults (aged 15-99 years) diagnosed during 2005-2009 and followed up to 2010: England.

Ten-year age-standardised relative survival for adults (aged 15-99 years) predicted for patients diagnosed in 2007 (using the hybrid approach): England and Wales.

Survival is not age-standardised for cancers of the brain, lung, oesophagus or stomach.

Bowel is shown here separately as colon and rectum (which includes part of anus).

Brain includes invasive cancers of the brain only.

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## CONCLUSIONS

The reasons why males seem to be so much more prone to developing cancer than females are complex and still only partially understood.<sup>22</sup> There may be a biological component, with women's sex-hormones and immune system being implicated in some of the differences seen, though these have not been fully explored.<sup>23</sup> There may also be factors related to ethnicity and family history of cancer, which increase susceptibility to certain cancers, for instance prostate cancer in African Caribbean men.<sup>24</sup>

The social determinants of cancer risk such as socio-economic status, educational attainment, and living and working conditions, are strongly implicated in increased cancer risk in men.<sup>6,25-27</sup>

Linked to this, it is possible that the incidence of those cancers caused by smoking, and influenced by diet,

excessive alcohol consumption, and being overweight reflect sex differences in such behaviours.<sup>28,29</sup> However, there are likely to be a number of other factors that contribute to the inequality between the sexes, including links to infection,<sup>30</sup> lack of physical exercise,<sup>31</sup> differential exposure to the sun,<sup>32</sup> potential differences in symptom awareness<sup>33</sup> and differences in uptake of screening opportunities.<sup>34</sup>

More research is required to unravel these relationships in the hope that avoidable inequalities can be reduced and eventually eliminated. Taking a more proactive approach to the prevention of cancer in men will also be an important step in meeting the first objective of the new NHS Mandate<sup>35</sup>, which is to prevent premature death.

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This report was prepared by Professor Alan White (Centre for Men's Health, Leeds Metropolitan University), Catherine Thomson and Tori Howard (Cancer Research UK, Stats Info Team) and Jon Shelton (National Cancer Intelligence Network). Many thanks to Ella Ohuma, Katrina Brown and Lucy Ironmonger (Cancer Research UK, Stats Info Team) for data preparation; and Alan Slater (Cancer Research UK, Stats Info Team) for graphic design and layout.

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