

Breast Cancer UK submission to the Independent Cancer Task Force: A new Five Year Strategy for Cancer Services

Summary

Breast Cancer UK supports the establishment of the Independent Cancer Task Force and welcomes the opportunity to feed into the proposed new Five Year Strategy for Cancer Services.

Breast Cancer UK would like to see a broader commitment to primary prevention within the new cancer strategy. The strategy must do more to look at all ways in which the environment influences cancer incidence and explore how we can make our environment a healthier place to live. A healthier environment, not just healthier lifestyles, is the key to reducing incidence rates, preventing needless suffering and reducing the burden on the NHS.

Breast Cancer UK urges the Task Force to develop a new Five Year Strategy for Cancer Services which includes:

- A recommendation that an independent task force be established to review national research efforts and develop a comprehensive national strategy on environmental and genetic factors related to cancer;
- A commitment to develop and implement a primary cancer prevention strategy which commits to the improvement of our understanding of the aetiology of cancer and acknowledges the links between certain cancers and environmental pollutants and other exogenous chemicals that are harmful;
- A commitment to an increase in cancer research funding over the next 5 years by NCRI research partners into “Exogenous Factors in the Origin and Cause of Cancer” (CSO 2.1) from 1.3% to 4.3% of total funding, returning it to levels seen in 2002, and that funding into “Prevention” (CSO 3) is increased from 3.4% to at least 5%, to help reflect the urgent need to identify interventions to help reduce cancer risk; and,
- A recommendation that NHS advice services publish advice for pregnant women on reducing *in utero* exposures to hazardous chemicals, including endocrine disrupting chemicals.

1. About Breast Cancer UK

Breast Cancer UK is dedicated to the prevention of breast cancers by reducing public exposure to the carcinogenic, hazardous and hormone disrupting chemicals which are routinely found in our environment and every day products. There is growing scientific concern that routine exposures to harmful chemicals, known as endocrine disrupting

chemicals (EDCs), which mimic, inhibit or interfere with natural hormones can lead to cell changes that may increase the risk of developing breast cancers and other diseases. Breast Cancer UK believes better environmental and public health policies are needed to encourage a preventative approach to diseases like breast cancer.

2. Developing a cancer strategy that reduces cancer incidence as well as mortality

“Despite exciting advances, [the World Cancer Report 2014] shows that we cannot treat our way out of the cancer problem. More commitment to prevention and early detection is desperately needed in order to complement improved treatments and address the alarming rise in cancer burden globally.”

Dr Christopher Wild, Director of International Agency for Research on Cancer (IARC)¹

According to Cancer Research UK statistics, incidence rates for all cancers in Great Britain increased by 23% in males during the period 1975-1977 to 2009-2011 and by 43% in females². It is predicted that 1 in 2 people living in the UK will get cancer at some point in their lives.³ Whilst we accept that the NHS must prepare for the consequences of this upward trend in cancer incidence, we do not accept that such a scenario must be inevitable, but believe that more can be done to help prevent people from getting cancer in the first place.

Of particular concern to us, is the rising incidence rate of hormonal cancers such as breast cancer. It is widely known that breast cancer is the most common cancer amongst women in the UK. The lifetime risk of a women developing the disease is 1 in 8 – up from 1 in 9 in 2001 and 1 in 12 in 1996^{4,5}. Over 50,000 women in the UK are diagnosed every year⁶ and 1 in 5 is likely to be under the age of 50⁷. Breast cancer in men, whilst rare, is also on the rise^{8,9}. Moreover, data suggests that breast cancer risk has increased over time. One study found that amongst those women with a genetic predisposition to the disease, breast cancer risk was just 24% for those born before 1940 but increased to 67% for those born after 1940¹⁰.

¹ IARC (2014) Press Release 224; ‘Global battle against cancer won’t be won with treatment alone Effective prevention measures urgently needed to prevent cancer crisis’ http://www.iarc.fr/en/media-centre/pr/2014/pdfs/pr224_E.pdf (Accessed 27th February 2015)

² <http://www.cancerresearchuk.org/cancer-info/cancerstats/incidence/all-cancers-combined/>

³ Ahmad et al. (2015). Trends in the lifetime risk of developing cancer in Great Britain: comparison of risk for those born from 1930 to 1960. *British Journal of Cancer* (2015): 1-5. Advance Online Publication: 3 February 2015.

⁴ Cancer Research UK (2014a). Breast Cancer. Breast Cancer Key Stats.

http://publications.cancerresearchuk.org/downloads/Product/CS_KF_BREAST.pdf Accessed February 19 2015

⁵ Office of National Statistics, Cancer Registration, Statistics, England (2012) <http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-352128>

⁶ WHO report (2014). Cancer Country Profiles, 2014 http://who.int/cancer/country-profiles/gbr_en.pdf?ua=1 Accessed February 20 2015

⁷ Cancer Research UK (2014a). *op.cit.*,

⁸ White, J. et al. (2011) Male breast carcinoma: increased awareness needed. *Breast Cancer Research* **13**: 219-225. <http://breast-cancer-research.com/content/13/5/219>

⁹ Office for National Statistics: Breast Cancer: Incidence, Mortality and Survival, 2010. September 28 2012

http://www.ons.gov.uk/ons/dcp171780_280355.pdf Accessed February 19 2015

¹⁰ King MC, Marks JH, Mandell JB (2003) Breast and ovarian cancer risks due to inherited mutations in BRCA1 and BRCA2. *Science*. 2003 Oct 24; 302(5645):643-6. <http://www.ncbi.nlm.nih.gov/pubmed/14576434>

Over the past decade, the National Strategy for Cancer and the focus on improving cancer services has ensured that we are getting better at diagnosing cancer, coming up with more effective treatments and enabling people to live longer with the disease. Yet it remains a devastating and traumatic disease which has profound, long term effects on those that are affected by it. In addition, the financial costs of cancer are enormous. The costs to the UK of breast cancer alone, is an estimated £1.5 billion each year with the average 15-month cumulative health-care costs estimated to be £12,595 per-patient¹¹. The NHS is already under tremendous pressure and will not be able to cope with the rising numbers of people being diagnosed and living longer with the disease. The best way to relieve pressure on the NHS is to prevent as many incidences of the disease as possible.

On the release of their World Cancer Report 2014, the Director of IARC, Dr Christopher Wild, stated that, “We cannot treat our way out of the cancer problem – we must focus on prevention”¹². The Cancer Task Force has a unique opportunity to address this key issue of prevention and tackle the complex but urgent need to reduce incidence rates as well as implementing measures to reduce mortalities.

3. Developing a cancer prevention strategy based on a comprehensive understanding of the aetiology of cancer

“Prevention has the potential to save more lives from cancer than treatment—as is already true for tobacco and lung cancer—which underlines the importance of strongly supporting this research area.”

National Cancer Institute, US Department of Health and Human Services¹³

Successful prevention is reliant on a good understanding of cancer aetiology. In general, when the underlying cause of a disease is identified, steps can be taken to reduce its incidence. This has been the case for interventions where there are strong associations between cancer and infectious agents (e.g. introduction of a human papilloma vaccine to reduce cervical cancer), or established environmental pollutants (e.g. reducing asbestos exposure and the incidence of mesothelioma).

Yet the percentage of UK cancer research funding that goes towards the aetiology of cancer has halved over the last 10 years. In 2005, over £52 million (15% of total research spending) went towards research to identify the causes or origins of cancer – genetic, environmental and lifestyle, and the interactions between these factors. This has decreased steadily over

¹¹ Hall et al (2014). Costs of cancer care for use in economic evaluation: a UK analysis of patient-level routine health system data. *British Journal of Cancer* (2014): 1–9. Advance Online Publication: 20 January 2015

¹² IARC (2014) Press Release 224; ‘Global battle against cancer won’t be won with treatment alone Effective prevention measures urgently needed to prevent cancer crisis’ http://www.iarc.fr/en/media-centre/pr/2014/pdfs/pr224_E.pdf (Accessed 27th February 2015)

¹³ National Cancer Institute, US Department of Health and Human Services, National Institute of Health. 2013 Handbook http://www.cancer.gov/aboutnci/budget_planning_leg/fact-book/nci-fact-book-2013

the last ten years and in 2013 this figure stood at less than £38 million (just 7.6% of total research funding).¹⁴

Within this classification only a very small percentage goes towards the exogenous factors that contribute to cancers. According to the NCRI, cancer research funding into the exogenous causes of the disease (CSO2.1) accounted for just 1.3% (significantly down from 4.2% in 2002) and for breast cancer research, spending in this area accounted for only 0.6% of the budget, compared to a far greater proportion (5.1%) in 2002¹⁵. If we are to stop cancer before it starts, we must invest further in finding out what causes it.

We urge the task force to support an increase in cancer research funding into prevention and aetiology over the next 5 years: Specifically that research funding into prevention (CSO3) is increased to at least 5% of total funding and funding into 'Exogenous Factors in the Origin and Cause of Cancer (CSO 2.1) is increased from 1.3% to 4.3% (returning it to the same level of funding as in 2002).

4. Developing a cancer prevention strategy that goes above and beyond lifestyle and genetics.

"Cancer is a genetic disease, but many of these genetic events are environmentally influenced and represent somatic alterations that arise from unknown environmental exposures. Elucidation of these exposures in the environment and minimizing risk is as important in fighting cancer as the rush to clone genes."

*O'Brien, J.M. Environmental and Heritable Factors in the Causation of Cancer (2000)*¹⁶

If we are to prevent more cancers, prevention strategies must move beyond their current focus on lifestyle, behaviours and genetics. To date, previous strategies for cancer prevention in the UK have focused on reducing alcohol consumption, encouraging active lifestyles, discouraging smoking and identifying genetic predispositions to the disease.¹⁷ Whilst we agree that encouraging healthy lifestyles is important, it can only have a limited impact on hormonal cancers such as breast, ovarian or prostate.

Yet none of the UK Cancer Plans nor the National Prevention Research Initiative (NPRI) which set out to "develop and implement successful, cost-effective ways of reducing people's risk of illnesses by influencing their behaviour and lifestyle"¹⁸ has fully acknowledged or explored ways in which to identify, understand and/or eliminate the

¹⁴ All data (2014) <http://www.ncri.org.uk/what-we-do/research-database> (Last accessed 27th February 2015)

¹⁵ Data on top 6 cancers by research funding (2014) <http://www.ncri.org.uk/what-we-do/research-database>

¹⁶ O'Brien, J.M. Environmental and Heritable Factors in the Causation of Cancer (2000). Survey of Ophthalmology 45 (2) 167-168

¹⁷ E.g see Improving Outcomes: A Strategy for Cancer (2011); Better Cancer Care, An Action Plan (2008); Together for Health, Cancer Delivery Plan for the NHS to 2016; Regional Cancer Framework: A Cancer Control Programme for Northern Ireland (2006).

¹⁸ See <http://www.cancerresearchuk.org/funding-for-researchers/how-we-deliver-research/our-research-partnerships/national-prevention-research-initiative>

environmental factors that contribute to breast and other cancers. In our opinion this is a significant flaw in current cancer prevention policy.

5. The role of harmful chemicals in breast cancer.

“..there are now indications that increased breast cancer risk is associated with the body burden of all oestrogenic chemicals”

European Environment Agency 2012¹⁹

It is widely accepted that biological and environmental factors contribute and interact with one another to increase cancer risk. For breast cancer, known biological factors which increase risk include lifetime exposure to oestrogens, (due principally to their ability to increase rates of cell division²⁰ and consequently gender, reproductive status, age and genetic predisposition²¹).

One comprehensive study found lifestyle factors, including alcohol and obesity, together with reproductive and post-menopausal hormones, ionising radiation²² and occupational exposures only account for an estimated 27% of all breast cancer cases.²³ Other studies suggest hereditary factors are associated with less than 30% of all breast cancer cases.^{24,25} Of these the majority of mutations (5-10%) are found in high-penetrance genes, such as BRCA1, BRCA2, PTEN, TP52, CDH1 and STK11, with a minority associated with moderate-penetrance genes (e.g. CHEK2, BRIP1, ATM, and PALB2). Models suggest additional high-penetrance genes are unlikely to be found and the contribution of multiple, low penetrance genes are unlikely to be very significant.²⁶ Therefore, the majority of breast cancers are due to unidentified factors, likely to be environmental.²⁷

Environmental oestrogens can exert similar effects to endogenous oestrogens and so may increase the risk of breast cancer in a similar manner. Environmental oestrogens include Endocrine Disrupting Chemicals (EDCs).²⁸ In addition to acting as oestrogen mimics, some EDCs act as androgen “antagonists”, so prevent hormone-receptor binding, thus blocking subsequent actions. Others can alter the concentration of naturally circulating hormones or

¹⁹ European Environment Agency (2012). The Weybridge+15 (1996–2011) Report: The impacts of endocrine disrupters on wildlife, people and their environments <http://www.eea.europa.eu/publications/the-impacts-of-endocrine-disrupters> Accessed February 20 2015

²⁰ Preston-Martin, S. et al. (1990). Increased cell division as a cause of human cancer. *Cancer Research* 50(23): 7415–7421.

²¹ McPherson, K. et al. (2000). ABC of Breast Diseases Breast cancer—epidemiology, risk factors, and genetics. *British Journal of Medicine* 321(7261): 624–628

²² Boice, J.D. et al. (1987). Risk of breast cancer following low-dose radiation exposure. *Radiology* 1979 131(3): 589-97. <http://www.ncbi.nlm.nih.gov/pubmed/441361>

²³ Parkin et al. (2011). The fraction of cancer attributable to lifestyle and environmental factors in the UK in 2010 Summary and conclusions. *British Journal of Cancer* 10: S77 – S81.

²⁴ Shiovitz, S. and Korde, L. A. (2015). Genetics of breast cancer: a topic in evolution. *Annals of Oncology* 00: 1–9, 2015 published online, February 19.

²⁵ Lichtenstein P, et al. Environmental and heritable factors in the causation of cancer: analyses of cohorts of twins from Sweden, Denmark, and Finland. (2000). *The New England Journal of Medicine* 343(2):78–85

²⁶ Shiovitz, S. and Korde, L. A. (2015). Genetics of breast cancer: a topic in evolution. *Annals of Oncology* 00: 1–9, 2015 published online, February 19.

²⁷ Lichtenstein P, et al. (2000) Op. cit.,

²⁸ IPCS. (2002). Global assessment of the state-of-the-science of endocrine disruptors. Geneva, Switzerland, World Health Organization, International Programme on Chemical Safety. <http://www.who.int/ipcs/publications/en/ch1.pdf?ua=1> Accessed February 20 2015

cause heritable changes through “epigenetic” modification, which changes gene expression without altering the underlying DNA gene sequence.²⁹

A number of synthetic oestrogens are already recognized as increasing the risk of breast cancer including Hormone Replacement Therapy (HRT) and the oral contraceptive pill³⁰. There is now increasing evidence that other chemicals known to act as oestrogen mimics, including parabens used as preservatives in food and cosmetics, Bisphenol A used in plastics and phthalates, used in plastics and fragrances may also cause damage. All are oestrogenic in tissue culture and some have been found to act additively with natural oestrogens³¹ to adversely impact the breast, its development, density and cell proliferation, in a way which could increase its vulnerability to breast cancer.

Whilst the role that EDCs play in ill health and cancer continues to be the subject of debate, it is vital that the Task Force do not dismiss the problem of harmful chemical exposures on the supposition that the science is inconclusive. Strengthening our understanding of chemicals such as EDCs and how they interact with each other and our bodies will help us to identify and take steps to eliminate some of the chemical causes of cancers. Only when we have done this will we begin to make progress towards stopping the tidal wave of cancer cases that will swamp the NHS in the next decade.

6. A strategy that acknowledges the role of exogenous chemicals in cancer risk

“Worldwide, there has been a failure to adequately address the underlying environmental causes of trends in endocrine diseases and disorders. Health-care systems do not have mechanisms in place to address the contribution of environmental risk factors to endocrine disorders. The benefits that can be reaped by adopting primary preventive measures for dealing with these diseases and disorders have remained largely unrealized.”

WHO/UNEP Report 2012³²

There is now growing global concern that exposure to harmful chemicals and particularly hormone disrupting chemicals could be contributing to an increased risk of many diseases including cancers. Scientists³³, politicians³⁴, pan European cancer NGOs³⁵ and international

²⁹ Diamanti-Kandarakis E, et al. (2009). *Endocrine-disrupting chemicals: an Endocrine Society scientific statement*. Endocrine Reviews, 30(4): 293–342. <http://www.ncbi.nlm.nih.gov/pubmed/19502515>

³⁰ Travis, R.C. and Key, T.J. (2003). Oestrogen exposure and breast cancer risk. *Breast Cancer Research* 5: 239-247. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC314432/>

³¹ Jenkins, S. et al. (2012). Endocrine-active chemicals in mammary cancer causation and prevention. *Journal of Steroid Biochemistry and Molecular Biology* 129(3-5): 191-200. <http://www.ncbi.nlm.nih.gov/pubmed/21729753>

³² WHO/UNEP (2012) State of the science of endocrine disrupting chemicals <http://www.who.int/ceh/publications/endocrine/en/>

³³ See for example the Berlaymont Declaration:

http://www.brunel.ac.uk/~data/assets/pdf_file/0005/300200/The_Berlaymont_Declaration_on_Endocrine_Disrupters.pdf

³⁴ <http://env-health.org/news/latest-news/article/top-policy-makers-support-curbing>

³⁵ Parliament Magazine (January 2015) ‘Europe-wide cancer group calls for action on hormone disruptors’

<https://www.theparliamentmagazine.eu/articles/opinion/europe-wide-cancer-group-calls-action-hormone-disruptors#.VK-fMDQmWkS.twitter>

health organisations³⁶ have made statements supporting the need to curb the use of EDCs in an effort to protect public health. In 2012, the World Health Organisation and United Nations Environment Programme published an assessment of the state of the science of endocrine disruptors³⁷. It noted three key areas of concern: –

- that many endocrine related diseases and disorders (include cancers) were on the increase;
- that endocrine-related effects had been observed in wildlife populations; and,
- that the identification of chemicals with endocrine disrupting properties had been increasingly linked to disease.

It also noted that “The speed with which the increases in disease incidence have occurred in recent decades rules out genetic factors as the sole plausible explanation. Environmental and other non-genetic factors, including nutrition, age of mother, viral diseases and chemical exposures, are also at play, but are difficult to identify.”

The report concludes that “Worldwide, there has been a failure to adequately address the underlying environmental causes of trends in endocrine diseases and disorders. Health-care systems do not have mechanisms in place to address the contribution of environmental risk factors to endocrine disorders. The benefits that can be reaped by adopting primary preventive measures for dealing with these diseases and disorders have remained largely unrealized.”

This is a unique opportunity for the Task Force to implement measures that would ensure that the UK moved to the forefront of research into the role of EDCs in endocrine-related cancers.

7. A strategy that prioritises early intervention for prevention

“The reason for the growing concern over everyday chemical exposure effects is because many of these chemicals have the potential to interfere with one or more hormone systems in the body, which play key roles in normal fetal development.”

*The Royal College of Obstetricians and Gynaecologists (2013)*³⁸

There is growing concern amongst scientists and clinicians, including the Royal College of Obstetricians and Gynaecologists, about the potentially adverse and long term health effects of early exposures to harmful chemicals during critical moments of development, for example in the womb, during early infancy, childhood or into puberty which could also increase the risk of developing diseases and cancers later in life.^{39,40,41,42,43, 44, 45}

³⁶ WHO/UNEP (2012) *Op. cit.*,

³⁷ WHO/UNEP (2012) *Op. cit.*,

³⁸ Bellingham, M., Sharpe, R.M. (2013). ‘Chemical Exposures During Pregnancy: Dealing with Potential, but unproven, risks to child health.’ Scientific Impact Paper No 37. https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip_37.pdf Accessed February 5 2015

³⁹ Report of the Interagency Breast Cancer and Environmental Research Coordinating Committee (IBCERCC) (2013). ‘Breast Cancer and the Environment Prioritising Prevention Prioritising Breast Cancer’. http://www.niehs.nih.gov/about/assets/docs/ibcercc_full_508.pdf.

⁴⁰ Barouki, R, et al. (2012). Developmental origins of non-communicable disease: Implications for research and public health.

Health departments of other countries have released publications expressing concern that early exposures to certain harmful chemicals could be increasing human vulnerability to diseases and have either provided further information to pregnant women to try and help them reduce unnecessary exposures or are carrying out further research to try and assess how pre-natal exposure to environmental chemicals may increase the risk of breast cancers.⁴⁶

Pregnancy advice regarding *in utero* exposures to potential carcinogens and other harmful chemicals is provided by several countries. For example, in Denmark, the Environmental Protection Agency (EPA) published an information booklet offering advice about chemical exposures and pregnancy⁴⁷ and in the USA, the Association of The American College of Obstetricians and Gynecologists and the American Society for Reproductive Medicine (ASRM) recently issued a joint opinion advocating that government policy changes to identify and reduce exposure to toxic environmental agents to help protect pregnant women⁴⁸.

Efforts to prevent cancer must start at the earliest opportunity. It is vital that more is done to prevent future generations from becoming increasingly vulnerable to disease. Breast Cancer UK believe that the NHS should provide advice to pregnant women acknowledging the potential risk of unnecessary exposures to harmful chemicals, and provide tips and advice on how to reduce exposures as part of their Pregnancy Planning Toolkit.⁴⁹

8. Addressing occupational exposures as risk factors for cancer

“Despite significant scientific evidence about its known or suspected causes, research and prevention measures to identify and eliminate occupational and other environmental hazards and risk factors for breast cancer remain largely overlooked. As a result, hazards continue unabated for women generally, especially those who work outside the home.

American Public Health Association⁵⁰

http://www.toxicology.org/AI/MEET/cct_pptoxiii/pptoxiii_consensus_paper.pdf

⁴¹EEA. (2012). *Op.cit.*,

⁴²UNEP/WHO (2013). *Op.cit.*,

⁴³Knower, KC, *et al.*, (2014). Endocrine disruption of the epigenome: a breast cancer link *Endocrine Related Cancer* 21(2): T33-55. <http://www.ncbi.nlm.nih.gov/pubmed/24532474>

⁴⁴Darbre, PD and Charles, AK (2010). Environmental Oestrogens and Breast Cancer: Evidence for Combined Involvement of Dietary, Household and Cosmetic Xenoestrogens. *Anticancer Research* 30: 815-828. <http://www.ncbi.nlm.nih.gov/pubmed/20393002>

⁴⁵Soto, A.M. *et al.* (2013). Does cancer start in the womb? Altered mammary gland development and predisposition to breast cancer due to in utero exposure to endocrine disruptors. *Journal of Mammary Gland Biology Neoplasia* 18(2): 199-208. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3933259/>

⁴⁶See for example; <http://www.chdstudies.org/research/index.php#study1> Accessed February 26 2015

⁴⁷Danish Environmental Protection Agency (2012). *Expecting a baby? Advice about chemicals and pregnancy.* Copenhagen, Danish EPA <http://www.mst.dk/NR/rdonlyres/68EAF0D0-37BF-4E50-840527E5F8C3FCA9/0/Expectingababy.pdf>

⁴⁸http://www.acog.org/About_ACOG/News_Room/News_Releases/2013/Environmental_Chemicals_Harm_Reproductive_Health

⁴⁹See for example the NHS Pregnancy and Baby Guide at <http://www.nhs.uk/conditions/pregnancy-and-baby/pages/pregnancy-and-baby-care.aspx#close>

⁵⁰American Public Health Association. Policy Statement 20146 (2014). Breast Cancer and Occupation: The Need for Action. <http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2015/01/07/14/55/breast-cancer-and-occupation>

Another area that requires further research funding is that of Occupational Exposures and Breast Cancer; such exposures are often preventable. Although relatively few studies have been carried out in this field there is evidence⁵¹ that hazardous chemicals, including known or suspected carcinogens and EDCs, contribute to increased risk. For example, one study found higher rates of breast cancer in premenopausal women employed in automotive plastics and food canning work⁵² and another suggested breast cancer risk among male workers in the plastics and rubber industries is almost quadruple⁵³. Chemicals commonly present in the production of plastics include mammary carcinogens and EDCs and it has been shown that the work-environment in this sector is heavily contaminated with ingredient, by-product, and product dusts, vapours, and fumes⁵⁴.

Teitelbaum et al. (2015)⁵⁵ articulate the need for elucidating the mechanisms of EDCs in breast cancer and for a comprehensive model that will facilitate preventive strategies and public policy. Linking common environmental exposures, critical windows of exposure and optimal times of assessment in investigating breast cancer risk is also needed.

9. Examples of good practice elsewhere

The Task Force specifically requested examples of good practice in cancer services that we would like to see replicated across the country. As we highlight above, the UK invests relatively little into this key area of research and prevention so we have to look abroad to find good examples which we believe should be replicated here in the UK.

Globally, funding into cancer prevention represents 3-4% of the total cancer research budget and into the exogenous causes of breast cancer represents only 2% of the total budget⁵⁶. Within the International Cancer Research Partnership (ICRP), which includes organisations from Australia, Canada, France, Japan, the Netherlands, United Kingdom, and the United States, the US National Institutes of Health is the predominant funder for research into the environmental influences on breast cancer, and generates the most publications. Non-ICRP funding organisations producing significant research outputs include the National Natural Science Foundation of China and the European Union.

However, in 2008, the United States government set up an advisory committee of leading breast cancer experts, the Interagency Breast Cancer and Environmental Research

⁵¹ Ibid.,

⁵² Brophy J.T. et al. (2012). Breast cancer risk in relation to occupations with exposure to carcinogens and endocrine disruptors: a Canadian case-control study. *Environmental Health* 11(87): 1–17

⁵³ Ewertz M, et al. (2001). Risk factors for female breast cancer—a case–control study from Scandinavia. *Acta Oncologica* 40:467–471

⁵⁴ DeMatteo R, et al. (2012) Chemical exposures of women workers in the plastics industry with particular reference to breast cancer and reproductive hazards. *New Solutions* 22: 427–448

⁵⁵ Teitelbaum S.L., et al. (2015) Advancing research on endocrine disrupting chemicals in breast cancer: Expert panel recommendations. *Reproductive Toxicology* (in press) <http://dx.doi.org/10.1016/j.reprotox.2014.12.015>

⁵⁶ Sutton P, et al. (2014). California Breast Cancer Prevention Initiatives: Setting a research agenda for prevention. *Reproductive Toxicology* (in press) <http://dx.doi.org/10.1016/j.reprotox.2014.09.008>

Coordinating Committee (IBCERCC)⁵⁷, to review federal research efforts concerning environmental and genetic factors related to breast cancer and develop a strategy for future research. Their first report, published in 2013, concluded that identifying and eliminating the environmental causes of breast cancer presents the greatest opportunity to prevent the disease. The report also notes that in the US more than 84,000 chemicals are registered for commercial use and less than 2% have been tested for breast cancer-causing effects. They specifically mention the lack of understanding of breast cancer risk due to endocrine disrupting chemicals and recommend further research in this area. They conclude that four priority areas of research should examine the following:

- Which environmental exposures impact breast cancer risk or the susceptibility to breast cancer?
- When do the exposures have their (greatest) effects?
- What are the underlying mechanisms for the effect of environmental exposures on breast cancer risk or recurrence?
- Who is at risk for breast cancer from environmental exposures?

According to their last published figures, approximately 6.3% of the United States National Cancer Institute's \$5 billion budget was allocated to cancer prevention and control⁵⁸.

Such a review of research efforts and a strategy for future research and prevention would also benefit the UK.

Another example of good practice in the USA can be found at the California Breast Cancer Research programme⁵⁹, one of the largest breast cancer research funders globally, which has committed half its funds to a Breast Cancer Prevention initiative (CBCPI). It aims to identify and eliminate environmental causes of breast cancer and implement population-level interventions on known or suspected breast cancer risk factors and protective measures.

The National Cancer action plan of France acknowledges environmental exposures and the need to reduce environmental cancers. In addition to reducing known risk factors such as smoking, obesity and alcohol they also aim to protect populations from the risk of “occupational and environmental cancers”. They state that “Knowledge, observation and surveillance of cancers related to environmental exposure will be developed, for both known and potential carcinogens”.⁶⁰

⁵⁷ IPCBRCC report http://www.niehs.nih.gov/about/assets/docs/breast_cancer_and_the_environment_prioritizing_prevention_508.pdf

⁵⁸ NIH (2015). National Cancer Institute, US Department of Health and Human Services. National Institute of Health. An Annual Plan and Budget Proposal for Fiscal Year 2016 http://www.cancer.gov/aboutnci/budget_planning_leg/plan-2016

⁵⁹ California Breast Cancer Research Program <http://www.cbcrp.org/>

⁶⁰ French Summary plan cancer (2014) <http://www.iccp-portal.org/sites/default/files/plans/Summary-plan-cancer-2014-2019-Anglais.pdf>

10. Breast Cancer UK conclusions and recommendations for the new Five Year Strategy

Evidence gathered in this submission highlights the urgent need to explore all options in our fight to prevent cancer and cautions against ignoring growing global scientific concern about the links between harmful chemicals and ill health. To date the UK invests only a small proportion of its significant cancer research budget into understanding the exogenous causes of the disease. This has led to significant prevention policies which ignore the links between exposures to harmful exogenous chemicals and major cancers like breast cancer. The new five year cancer strategy must take steps to redress this balance.

Breast Cancer UK urges the Task Force to develop a new Five Year Strategy for Cancer Services which includes:

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- A commitment to develop and implement a primary cancer prevention strategy which commits to the improvement of our understanding of the aetiology of cancer and acknowledges the links between certain cancers and environmental pollutants and other exogenous chemicals that are harmful;
- A commitment to an increase in cancer research funding over the next 5 years by NCRF research partners into “Exogenous Factors in the Origin and Cause of Cancer” (CSO 2.1) from 1.3% to 4.3% of total funding, returning it to levels seen in 2002, and that funding into “Prevention” (CSO 3) is increased from 3.4% to at least 5% to help reflect the urgent need to identify interventions to help reduce cancer risk; and,
- A recommendation that NHS advice services publish advice for pregnant women on reducing *in utero* exposures to hazardous chemicals, including endocrine disrupting chemicals.

For further information or to discuss our submission please contact Lynn Ladbrook, Chief Executive, Breast Cancer UK on 0845 680 1322.

27th February 2015