Top 10 research priorities from NCRI initiative revealed today

The spotlight will be turned to NCRI’s ‘Living with and beyond cancer’ initiative this morning – a unique and important venture aiming to increase research focus and ultimately improve the lives of people living with the consequences of cancer and its treatment.

The Living with and beyond cancer (LWBC) initiative grew out of the realisation that undefined research priorities in this broad arena have been a barrier to research. With the number of people living with and/or beyond cancer in the UK currently numbering 2.5 million – and estimated to increase to more than 4 million people by 2030 – and coupled to the an increasingly ageing population are living with more and more chronic cancers, a clear and pressing need for defined research priorities has been highlighted by the NCRI and the NHS Independent Cancer Taskforce.

The initiative is UK-wide, formed by a Priority Setting Partnership with the James Lind Alliance, planned to cover all aspects of living with and beyond cancer including physical, psychological, social, financial, economic and spiritual aspects. It was launched in April 2017, with a UK-wide survey sent out in September of that year gauging which unidentified questions were priorities in the minds of patients, carers and professionals. This first survey was completed by almost 1,500 people, corresponding to 3,500 questions. In February 2018, a second survey was sent out comprising 54 grouped, summarised questions identified from the first round, with the ultimate aim of selecting the top 10 priority questions.

Nearly 2,000 people completed the second survey, including patients across all ages (over 16), pathways, cancer types, nations and a broad range of medical, nursing, allied health and social care professionals as well as many carers. In June of this year, the 27 most popular questions were discussed and prioritised as a top 10 in a workshop hosted by patients, carers and healthcare professionals.

This morning’s session serves up an introduction to the LWBC initiative, and reveals, for the first time, the final top 10 UK research priorities. The audience in attendance will be walked through how these priorities were chosen, how the research community and funders will be using the priorities, and what “good” living with and beyond cancer actually looks like from an expert’s perspective.

“This initiative is very unique, and it is the first time that clear research priorities have been identified,” Feng Li, Co-lead of the NCRI LWBC Priority Setting Partnership, told NCRI Daily News. “Also it is really unique in that cancer patients, carers and front-line clinicians have determined the priorities, i.e. the people who know what the reality of living with and beyond cancer is actually like.”

While everyone will have to wait until the session itself to find out the top 10 list, Dr Li shared some of the main themes that emerged from the surveys, including models for delivering long-term cancer care, communication and access to knowledge, psychological impact and lifestyle factors.

The session will be chaired by Richard Stephens from the NCRI Consumer Forum, a patient- and carer-driven group that gives input to ensure that research facilitated by the NCRI is relevant to real-world patient care.

Dr Li continued, introducing the next speaker: “Ceinwen Giles is Director of Shine Cancer Support [UK], a charity specifically supporting young people affected by cancer, including herself. She was diagnosed with a blood cancer really soon after she had her daughter, and she is still comparatively young, which really changed her life. She is on the steering group of the LWBC initiative, and will have 15 minutes to talk through the progress of projects.”

She will be followed by Galina Velikova (University of Leeds, UK) and Sam Ahmedzai (University of Sheffield, UK).

“They are both professors working in living with and beyond cancer research,” said Dr Li. “They each are going provide a researcher’s perspective on what good research looks like. They are the chairs of two different NCR clinical study groups, and they are going to talk about what these groups can offer.”

Last to speak at the podium will be Andrew Bottomley from the European Organisation for Research and Treatment of Cancer (EORTC), Belgium. As Deputy Director of the EORTC, and head of the Quality of Life department, he will be sharing the key that the EORTC is doing, including European initiatives focussing on metrics

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Living with and beyond cancer

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of quality of life after cancer diagnoses. “That’s really relevant because in the UK, the NHS is planning to increase investment in this area, working on a long-term cancer plan and, next spring, aiming to implement a new quality of life metric,” said Dr Li. “Before, emphasis was always on survival.”

Indeed, Dr Li stressed that there has been a paradigm shift away from “survival” in the current climate. “People are either living with cancer that does not need to be treated, are going through long-term treatment, living beyond cancer or they are living with advanced cancers,” she said. “So given the advance in research and treatment in recent years, patients can actually live many years like this. Therefore, the term ‘living with and beyond’ is much more encompassing.”

Finally, an extensive panel discussion will bring the session to a close, hoping to get immediate feedback and stimulate further dialogue of the top 10 priorities that will be unveiled. As Dr Li described, the session this morning serves as a first step in a long journey. This is very much a continuous project, she said, working with patients and carers to make sure that the research is relevant in times to come. “We have clinical study groups where around 1,000 top researchers get together to work on really large ambitious projects around the themes of our top priorities. We are also working with research funders, including NCRI partners and non-partners, to increase the research funding in this area in the future.” The initiative is also working with NHS to translate good research into actual patient benefit, and sooner rather than later, given that the research landscape can change very fast. “For the project, part of the rationale was in response to an NHS strategy to improve cancer outcomes. We have been working with them quite closely, and next year we are co-hosting an event to get researchers and commissioners together to accelerate translation into practice,” concluded Dr Li.

The NCRI is now working with its Partner organisations, other funders, researchers and the NHS to translate the priorities into research and patient benefit. Read more about the project at: https://www.ncri.org.uk/IWBC. A video of today’s session will also be available online.

Environmental exposure and cancer prevention

Air pollution and cancer

Environmental exposure and cancer prevention was placed front and centre on Monday morning, with John Cherrie (Heriot Watt University and the Institute of Occupational Medicine, UK) tackling the impact that air pollution has on cancer.

NCRI Daily News caught up with Professor Cherrie to find out more about this global burden, and what measures might be promising to effect change in the future.

What particular pollutants in the air are the real culprits for cancer risk – so-called particular matter (PM) 2.5 and 10?

It is clear that air pollution causes lung cancer and the most likely “candidate” exposure is fine airborne particulate. Unfortunately, epidemiological studies have to date not been able to identify the particular size range (PM10, PM2.5 or some other fraction) or the chemical composition of the causative exposures. These measures are generally correlated.

Toxicology would suggest that ultrafine particles (< 0.1 μm) are possibly the most important size, but there are few epidemiological studies that use this as an exposure metric.

What about nitrogen dioxide? Is the jury still out there?

The evidence for a link between air pollution and lung cancer is strongest for PM and there are no real indications that NO2 plays a role. However, there is weaker evidence for associations between air pollution and postmenopausal breast cancer and stomach cancer. For breast cancer there is a statistically significant association with oxides of nitrogen (NOx) – and with the nickel concentration in PM10, but not PM2.5 or PM10.

Another more recent study from Canada showed an association between the risk of breast cancer and particle number concentration.

What global burden of cancer do these pollutants cause? Lung cancer is surely the main outcome here, but how do the numbers stack up next to cigarette-born cancer?

The Global Burden of Disease (GBD) study has estimated the mortality and morbidity burden for indoor and outdoor air pollution. These types of burden studies are fraught with difficulties because of the limited data available and because of limitations to our knowledge. Overall, air pollution is fourth on the GBD list of environmental causes of disease burden (around 6 million deaths per year), just after tobacco smoking.

The research only estimated lung cancer burden from air pollution, but this is where the evidence is strongest. They estimate there are around 400,000 lung cancer deaths per...
annum from air pollution, which is about a quarter of all lung cancer deaths attributed to environmental factors. Although air pollution has a much lower relative risk for lung cancer than smoking it has a relatively large impact because we are all exposed to pollution whereas only a fraction of the population smoke.

Are other cancers linked as well (e.g. bladder?)

The IARC Monograph on outdoor pollution highlighted bladder cancer as a possible consequence of exposure, but since then the evidence for an association has weakened (ESCAPE did not find an association). There is weak evidence for a bladder cancer risk for workers exposed to diesel exhaust particulate, and diesel particulate is a component of outdoor air pollution. More studies are needed to confirm whether bladder cancer is associated with outdoor pollution.

As noted above there is weak evidence for associations between outdoor air pollution and breast cancer and stomach cancer.

As you’ve mentioned before, pollutant levels in Europe and North America are steadily decreasing due to technological advancements, but in other parts of the world are increasing. What regions are getting particularly worse, and why is that do you think?

I am working on research on air pollution in China and Thailand. In Thailand our preliminary analysis had suggested increasing levels for some pollutants, but our most recent analysis on a more complete dataset shows that most pollutant concentrations are decreasing; just ozone is increasing and NO2 essentially unchanged.

In my presentation I showed data from China (six cities) and Thailand for PM. These all show decreasing trends, although concentrations are higher in China than both Thailand and the UK.

There must be challenges in tracking cause and effect of pollution over time? Overall cancer rates are not strongly associated with pollution concentrations. The risk of disease is probably dependent on a long-term exposure over many decades, maybe over a whole lifetime. The epidemiological studies that look at cancer risks either follow a large cohort over many years and account for the risk from smoking and other possible causes in the statistical analysis or compare the exposure of cases (e.g. breast cancer) with controls, again adjusting for other risks.

How important was the ESCAPE trial in determining true risk for cancer from air pollution?

In my opinion, this is the most important air pollution epi-
demography study undertaken in recent years. It is likely to strongly influence our future approaches to air pollution.

**Have there been important/landmark studies since ESCAPE?**

Either way, what needs to be done do you think in terms of further study?

We need to improve methods used in ESCAPE to better characterise exposure to air pollutants and to apply these in other large epidemiological studies elsewhere around the globe.

You’ve noted how reducing PM by 5 μg/m³ could save tens of thousands of lives each year, but is there an “ideal” target PM level to aim for, or is there no threshold to how reducing PM levels relates to lower cancer risk?

Current thinking assumes there is no threshold for population response and so we should continue to reduce exposure as far as possible. I am not a proponent of “standards” or “target” concentrations. In my opinion it is better to look for continued improvement over time, perhaps aiming for reduction of annual average concentrations of more than 10% per annum. Such changes are achievable and are applicable to all countries, even when the concentrations are widely different.

**What’s your take-home message here?**

There is very little that individuals can do to affect their own air pollution exposure. Most interventions are targeted at pollution sources, such as vehicle emissions, or city traffic management. We need to put more effort into research to understand how personal behaviour can impact on long-term air pollution exposure. For example, what route should I choose to go to the office, or should I travel earlier to reduce my exposure to air pollution? This is an approach we hope to investigate.

We have recently been looking at the effectiveness of facemasks in protecting people from air pollution in controlled laboratory trials. We found that the best devices are those that are manufactured for use in factories (in US they are known as N95 masks – in Europe FFP3 masks). Surgical masks can provide some protection but there are many other consumer masks that provide little or no protection. We are just about to embark on more realistic trials in China to assess the real utility of such masks.
Sunday evening’s session, “Why is cancer so difficult? Understanding and measuring variability” saw Martin Christlieb, Public Engagement Manager at the Department of Oncology at The University of Oxford, UK, describe his role in patient outreach, as well as shedding some light as to some of the ways in which the huge variability of cancer can be understood.

A former research scientist in cancer imaging, one of Dr Christlieb’s key roles is to reach out to people living across Oxfordshire and the surrounding counties and offer them a chance to meet scientists from the University. “Many of them fund our work through taxes and donations to Cancer Research UK, and we want to make sure they can find out what their money is spent on,” he told NCRI Daily News.

Not only that, but public engagement is also about trying to raise the next generation of cancer researchers. “We engage young people in understanding the impact that science subjects can have, and try to help them see where studying science might lead them,” he explained. “We meet people whose lives have been touched by cancer and help to explore the work being done to improve outcomes tomorrow.”

Dr Christlieb added that his background as a researcher and working with Air Cadets as an outdoor instructor helps his present work immensely. “I use these skills to understand the research and then tell accessible stories of science for people who want to explore what we do,” he said.

Sunday’s session, which assumed no prior knowledge, drilled down into why cancer is so difficult to treat, with Dr Christlieb walking the audience through how a single cell can multiply into a diverse collection of cells. “The spread of cancer round the body and even treatment may lead to more diversity. One person can be different from the next,” he explained.

This variability is key in understanding why cancer still resists a cure. Dr Christlieb offered a chance for people to explore what makes cancer so variable, delving deeper into what challenges and opportunities this throws up, including work that’s beginning to shed light on the normal cells surrounding the tumour that are heavily involved in helping the tumour grow and might be a target for new therapies. Many of them come down to variability, and it is increasingly clear that cancer therapies must be tailored to the individual, he said.

“We don’t have all the answers, but I get a huge sense of hope that we are asking much better questions. Better questions have a chance of giving us better answers.”

Martin Christlieb

Personalising treatment – the key to variability
gives a cancerous result. If we are trying to target the right therapy to the right patient we need to be able to match our treatment to the exact bit of the cell that’s gone wrong. The bits in a cell that go wrong are proteins: too much, not enough; permanently inert or hyperactive.

There are some interesting ways that we can do this. We can perform tests on biopsies which are imaged under the microscope. We’ll see a specific example where we may be able to tell whether radiotherapy is right for someone’s bladder tumour.

People are developing new imaging agents to allow positron emission tomography (PET) and magnetic resonance imaging (MRI) to make it possible to visualise proteins and get a clue as to what’s going on. To see cancers earlier, or detect which proteins have gone wrong. We’ll see some specific examples such as using PET to assess whether trastuzumab might be the right for breast tumour, or detecting brain metastases much earlier than currently.

Finally we will take a quick look at where we may be able to side-step some of the tumour variability and select targets which may be more uniform from person to person allowing us to have more impact for more people.

In the session, Dr Christlieb looked at the sources of variability to offer understanding in how it may be possible to measure what exactly is occurring, and how that will impact treatment.

His presentation also explored some ideas for detecting molecular signatures from tumours. “If we are to counter diversity, we must be able to gauge the characteristics of an individual’s tumour,” he said. “That means being able to measure what matters, and have the tools to respond.”

Dr Christlieb went on to underline his belief that times are changing. “Our understanding of cancer is moving forwards, and with it comes a much-improved set of questions about what we need to understand and what we might do next,” he explained. “We don’t have all the answers, but I get a huge sense of hope that we are asking much better questions. Better questions have a chance of giving us better answers.”

He continued: “Cancer is complex and fascinating, and the challenges require biologists, chemists, physicists, mathematicians, patients, carers and engineers to work together and this means talking to each other as much as possible.

Martin Christlieb
InterTradeIreland

All-Island Cancer Trials Network

Collaboration between Cancer Trials Ireland and the Northern Ireland Cancer Trials Network

Synergy
Harnessing the power of cross-border collaborations

VISIT US AT STAND 10
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Today in Hall 4 – Silent theatre presentations

Oral presentations will take place in the Silent theatres during the coffee and lunch breaks, and are a chance for abstract submitters to present their research. A full schedule can be found below:

Silent theatre 1

10.30 Catherine Welch The impact of cardiovascular co-morbidities on surgical resection rate in patients with Non-Small Cell Lung Cancer: an analysis of the VICORI cardioncology programme

10.36 Jonathan Barton A single centre audit of the management of nausea and vomiting in advanced cancer patients referred to the Christie Hospital Supportive Care Team

10.42 Katharina Verleger Real-World Treatment Patterns and Clinical Outcomes in Advanced/Metastatic NSCLC Patients in England

10.48 Susan Moug Prehabilitation is feasible during neoadjuvant chemoradiotherapy and may minimize physical deterioration: Results from The REX randomised controlled trial.

12.46 Aisha Farooq A retrospective audit to evaluate the impact on overall survival in melanoma patients treated with pembrolizumab (Keytruda), who have received a dose banded dose versus patient specific dose.

12.52 Rebecca Fish A core outcome set for clinical trials of chemoradiotherapy interventions for anal cancer (CORMAC): A patient and health care professional consensus


13.04 Grace Tan Antibiotic use and efficacy of small molecule inhibitors in patients with advanced cancer

13.10 Hafsa Abbas Glyoxalase 1 overexpression associated multidrug resistance in cancer chemotherapy

13.16 Amanda Swan Vertebral fractures in patients treated with FOLFIRI-Cetuximab at the Edinburgh Cancer Centre

13.22 Somnath Mukherjee SCALOP-2: A randomised trial of induction GEMABX followed by chemoradiation (high/standard dose radiation) +/-nelfinavir for locally advanced pancreatic cancer: results of the dose-finding component

13.28 Rhian Gabe The Yorkshire Lung Screening Trial

13.34 Chiara Asselborn Selective vulnerability of colorectal cancer (CRC) organoids to hypoxia-mimetic drug

13.40 Debbie Cavers Living with and beyond cancer with comorbid illness: a qualitative systematic review

13.46 Michelle McCully What is fuelling overweight and obesity and which policy actions are needed? WCRF/AICR Third Expert Report

16.05 Lucy Johnston The meaning and measurement of outcomes in survivorship care

16.11 Lucy Johnston Systematic review of the implementation and impact of holistic needs assessments for people affected by cancer

The UK Top 10 living with and beyond cancer research priorities

Find out the most impactful research questions that will help people live better with and beyond cancer at the spotlight session on Tuesday 6 November, 11:00-12:30, Lomond Auditorium.

Find out more and register your research at www.ncri.org.uk/lwbc
Eamaan Syed ROR1- A biomarker for chemoresistance in ovarian cancer.

Susannah Brown Diet, nutrition, physical activity and the risk of aerodigestive cancers from the WCRF/AICR Third Expert Report

Eamaan Syed ROR1- A biomarker for chemoresistance in ovarian cancer.

Silent theatre 2

10.30 Akul Purohit Relapse rate and relapse patterns in patients undergoing curative resection for Pancreatic Ductal Adenocarcinoma (PDAC): Identifying high risk patients

10.36 Poornima Paramasivan A role for NRF-2 in the mechanism of action and effectiveness of dual tyrosine kinase inhibitor, lapatinib, in breast cancer cells

10.42 Zoe Martin Future of clinical trials after Brexit

10.48 Muhanad Alhujaily Glyoxalase 1 expression, copy number and survival analysis in clinical treatment of breast cancer

12.46 Karim Azar Disulfiram Inhibits NF-kappaB Pathway And Targets

12.52 Maria Martinez Hospital admissions with Immunotherapy toxicities in melanoma patients on Ipilimumab and Nivolumab

12.58 Rose Gray Improving treatment and care for older people with cancer

13.04 Milan Vu Betulinic acid-doxorubicin drug combination synergistically supresses cell viability and enhances apoptotic death in acute myeloid leukaemia cell lines by increasing Bax/Bcl-2 ratio

13.10 Noor Hasan The combination of curcumin and doxorubicin shows a selective cytotoxic effect on acute myeloid leukaemia cell line

13.16 Amit Goyal POSNOC – Positive Sentinel Node: Adjuvant therapy alone versus adjuvant therapy plus clearance or axillary radiotherapy (ISRCTN54765244, Clinicaltrials.gov NCT02401685)

13.22 Ivan Salaric Salivary melatonin and squamous cell carcinoma antigen 1 levels in patients with oral squamous cell carcinoma

13.28 Louis Fox Changes in physical activity and quality of life in men with prostate cancer participating in a physical activity behaviour change pathway

13.34 George Morrissey An Effective Pipeline for Whole Genome Sequencing for Research in a Tertiary Cancer Centre

13.40 Rebecca Richmond Investigating causal relationships between sleep characteristics and risk of breast cancer; a Mendelian randomization study

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between gut microbes and host immunity. The cytokine interleukin IL-22 plays a context-dependent role, promoting epithelial regeneration and protective barrier functions. In the intestine, the IL-22 receptor is restricted primarily to epithelial cells, activating Stat3 and so promoting host defense and repair through induction of cell proliferation, mucins, and antimicrobial peptides.

In certain settings, however, IL-22 can promote colitis by triggering the release of pro-inflammatory cytokines; furthermore, it can be associated with dysbiosis as well as epithelial proliferation progressing to tumorigenesis. IL-22 mediates CRC progression in animal models, as well as promoting malignant behaviour in human CRC cell lines. In humans, elevated serum levels of IL-22 are associated with chemotherapy resistance in patients with CRC, and IL-22 has been shown to mediate chemotherapy resistance in vitro. In this way, IL-22 functions in effect as a double-edged sword. Professor Powrie and others have pursued a better understanding of the IL-22 axis as a key driver of neoplasia and cancer in the intestine, with the aim of uncovering novel biomarkers and therapeutic targets to address unmet clinical needs in this area.

"Our studies are trying to understand how, in certain situations such as those that occur in inflammatory bowel disease (IBD), inflammation can progress towards colon cancer, and how in addition, inflammation can be at the root of spontaneous CRC," Professor Powrie told NCRI Daily News.

In her plenary lecture, Professor Powrie will discuss work looking to target IL-22 in order to dampen inflammation-driven tumorigenesis.

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Keep up-to-date and connected throughout the event by downloading the 2018 NCRI Cancer Conference App. To download simply search for ‘NCRI 2018’ in the Apple Store or Google Play to:

- View the agenda and learn more about sessions
- Build your own personalised schedule
- Browse and search abstracts
- View e-posters
- See who’s exhibiting and visit them at their stands
- Network with other delegates by adding your email address in the networking section
- Stay connected via social media

**COUNT YOUR STEPS!**

Get fit at the 2018 NCRI Cancer Conference and take part in our Daily Step Challenge. The person with the highest number of steps accumulated by the end of the day will be in with the chance to win a restaurant or sports voucher. The winner will be contacted via Twitter tomorrow morning. Here’s how to take part:

- Download a pedometer or health app on your smartphone, or use your own pedometer such as a fitbit or iPhone Health
- Follow the official NCRI Twitter account: @NCRI_partners
- Take a screen shot or photo of the total number of steps you’ve accumulated on Tuesday 6 November and tweet it to @NCRI_partners by 17:30
- Tag @SECglasgow including the hashtags #NCRIsteps #NCRI2018 & #healthyvenue
Could your idea accelerate cancer research?

Beyond the Horizon is a new meeting series that brings the right people together to have the right conversations at the right time.

We want you to suggest topics in areas of potentially transformative science and technology, or in fields that are not currently applied to cancer research, and could be harnessed to make a real difference to cancer research in the future.

Submit your topic suggestion by 12 November: www.ncri.org.uk/beyond
Today’s plenary lecture explores new preventative and therapeutic approaches to colorectal cancer

Work in the Powrie lab has also recently identified a novel synergy between IL-22 and a key oncogenic driving mutation, KRAS, which confers poor prognosis in human CRC. This has been explored in novel ex vivo culture systems as well as primary human CRC tissue.

Describing this work, she said: "We have looked at expression of the IL-22 receptor. In CRC patients who have high expression of the IL-22 receptor, a KRAS mutation has a very strong prognostic impact on the disease. This suggests that that IL-22 signalling pathway could be involved in humans."

"That is how we are moving from model systems to human disease – from mouse functional models to looking for these pathways in human, and how we might move on in the future (speculatively) to a more personalised approach for patients with certain oncogenes."

Crucial to the concepts of tumourigenesis and tumour immunity, explained Professor Powrie, is the microbiome, which has implications for tumour immunotherapy. The role of specific gut microbes as drivers of heterogenous response to immune checkpoint blockade has recently been reviewed.

Robust anti-tumour immunity is associated with favourable prognosis in CRC, explained Professor Powrie, yet T cell checkpoint inhibition immunotherapy has proven to be successful only in a small subset of patients. "The focus at the moment is harnessing the immune system to enhance anti-tumour immunity and combat the tumour. Clearly that has had a big impact in certain cancers. However, CRC is particularly bad in not being responsive to checkpoint blockade. There is really a clinical unmet need to look at other pathways that may reveal new treatments."

"That brings us to innate checkpoints. We have just published a paper describing a gene responsible for susceptibility to inflammation and inflammation-driven cancer. Our studies have identified an atypical kinase – alpha kinase 1 – that in a model system controls bacteria-driven colitis and colitis associated cancer."

Fiona Powrie

References

Discounted travel
Thank you for joining us at the 2018 NCRI Cancer Conference. If you’re heading to the airport this afternoon don’t forget that discounted travel is available for journeys between Glasgow Airport and City Centre with Glasgow Taxis. Pre-book your taxi by phoning +44 (0) 141 429 7070 using the following codes to get the discounted fare:
- Glasgow Airport to City Centre: use code GCB 1 – set fare £18.00
- City Centre to Glasgow Airport: use code GCB 2 – set fare £21.00

Keep active throughout the Conference and greet speakers with a standing ovation!

As part of our Wellbeing Programme we want to get you moving throughout the day, which is why our session chairs will be encouraging you to give a standing ovation at the end of each session.
Social inequalities in cancer screening participation

Jo Waller, Professorial Research Fellow in Behavioural Science and Health at the Institute of Epidemiology and Health at University College London (UK), discusses cancer screening participation during today’s session on inequalities in the cancer continuum.

During the session, she will explore the patterns of cancer screening participation by socioeconomic status, age and ethnicity, reviewing evidence of psychological factors underpinning differences in participation, as well as proposed methods to encourage informed participation in under-served groups.

Speaking to NCRI Daily News ahead of the session, she described issues surrounding cervical screening, where rates of participation have fallen in the UK in recent years, and colorectal cancer, where a different set of barriers have nevertheless led to persistent low rates of participation.

In recent study of data from a national sample of British women carried out by Professor Waller and colleagues, the majority of cervical cancer screening non-participants was explained by either a lack of awareness or lack of ability to translate positive intention into action. Women from ethnic minority backgrounds were more likely to be unaware of screening than white women, and being in a lower social grade was also associated with increased odds of non-participation.

More recently, the same dataset was used to explore the health beliefs that underpin non-participatory behaviours. “We asked questions about psychological factors and specific barriers to screening,” explained Professor Waller. “We found that there were differences in beliefs in those in different non-participatory groups.

“Unaware women were not only more likely to be from an ethnic minority background or have English as a second language, but they were also more likely to have more fatalistic beliefs, as well as believing that they would be able to tell if something was wrong with their body. One of the reasons that some people don’t go to screening is that they don’t have symptoms, but of course screening is actually aiming to pick up disease in non-symptomatic populations, so this represents a misconception that we might try to address.”

This study highlights the importance of interventions to raise awareness of screening, particularly addressing fatalistic and negative beliefs about cancer, and the relevance and benefits of screening.

It is not clearly understood why women might be unaware, especially within a healthcare system such as the UKs that sends invitations to screening. “It’s surprising that anyone in the eligible age groups for screening should be unaware,” commented Professor Waller. “The fact that someone who is registered with a GP and is in the age group is not aware of screening is concerning; it suggests either that there is a language barrier, or there is a general disengagement with healthcare. This is very different from other countries with different healthcare systems where people might not be offered screening, or might not be able to afford it.”

Strategies to combat non-attendance for screening among ethnic minority women have been previously been reported, and Professor Waller acknowledged a need for engagement with individual ethnic communities that takes into account culture and religious beliefs. “This is really relevant. That is a limitation of this kind of work, where you are using a population representative survey. You are typically getting 10-15% of participants from ethnic minority backgrounds, and you don’t have enough power to detect differences between different ethnic minority groups. These have not been adequately explored.”

Turning to the role of socioeconomic status in cervical screening uptake, Professor Waller continued: “There is a strong social gradient in uptake of screening across the board. Women from lower social class backgrounds are less likely to be aware of cervical screening but are also more likely than more affluent women to be intending to attend but not have got round to it. That might partly reflect lower literacy levels, or the nature of people’s lives where other stresses and priorities make it difficult to go for screening.”

This trend is also true of bowel cancer screening non-participants, noted Professor Waller, despite the availability of home-use faecal occult blood test (FOBT) kits.

However, the psychological barriers surrounding bowel screening are quite different to those of cervical screening. “The bowel screening kit is perceived as being quite difficult. People tend to think also that they can monitor their own bowel health.”

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Social inequalities in cancer screening participation

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“Bowel cancer is not talked about. Some of those beliefs are social graded as well. People with lower social grade and poorer education are more likely to perceive that the treatment of cancer is worse than the cancer itself.”

Bowel screening was recently deemed to be “unlikely to realise its full public health benefits and en route to widening inequalities in colorectal cancer outcomes” by Hirst et al (2018)4. Indeed, different strategies have been investigated with the aim of raising participation in both bowel and cervical cancer screening, explained Professor Waller. “What have been shown to work are generally healthcare system factors: making sure that people are invited and sending reminders. There is increasing evidence that text message reminders have an impact on uptake across screening programmes.

“Things like GP endorsements have been shown to be effective, so if people get a specific endorsement of the programme from their own GP, this makes them more likely to take part. In cervical screening, self-sampling has shown really promising results in non-attenders. Next year, the switch to HPV primary testing will mean that a self-sample could be used for the initial screening test, which isn’t the case at the moment. That opens the possibility that we might be able to engage non-attenders by sending them kits.”

A recently completed trial in the UK looked at testing innovative strategies to reduce the social gradient in the uptake of bowel cancer screening. Four theoretically based interventions were tested: ‘gist’ information, a ‘narrative’ leaflet, ‘general practice endorsement’ (GPE) and an ‘enhanced reminder’. While none had a strong effect on uptake or social gradient, the enhanced reminder reduced the gradient and modestly increased overall uptake, whereas GPE increased overall uptake but did not reduce the gradient.5

“This study shows that it is very difficult to find ways of impacting uptake if what you are relying on is changing the information materials you are sending to people,” commented Professor Waller. “Changing the way you present or word is seems to have quite a limited impact. It seems to be changing the way the service is provided that has a bigger effect.”

She added that, in breast screening, offering a weekend or evening appointment has been shown to be effective as a strategy to increase participation, and sending second timed appointments for women who don’t attend when first invited can also increase mammography uptake.

As such, pragmatic barriers seem to be more easily shifted in contrast to psychological barriers, concluded Professor Waller. “If you can remind people and make it easy for them to participate, those sorts of things seem to work better than changing the way we provide information.

“But for ethnic minority groups where people aren’t aware of screening, the approach is going to have to be quite different – more to do with community engagement raising awareness and tackling stigma, and not through sending people another invitation or text message reminder.”

Professor Waller speaks during ‘The burden of cancer due to inequalities and its likely causes’, which takes place in Hall 1 between 14:00 and 16:00.

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