

Genetic testing could improve cancer screening programmes

Calculating individual genetic cancer risk and taking age into account could mean women would need fewer breast screens, according to research published in the *British Journal of Cancer* today.

Based on work funded by Cancer Research UK (CRUK) and the European Community (COGS project), researchers say this new approach to screening would still detect the same number of cancers but could also potentially reduce any risks associated with screening such as over-diagnosis and unnecessary treatment, as well as saving money.

The researchers used mathematical modelling to compare those eligible for screening and the number of cancers potentially detected for purely age-based screening with screening based on genetic risk of cancer as well as age.

Almost 31,000 cases of breast cancer are diagnosed in women aged 35 to 79 in the UK each year.

From 2012, more than seven million women aged 47-73 will be invited for the NHS age-based screening programme each year, which can potentially detect around 22,400 cases of breast cancer annually. However, the researchers found that using the age and genetic programme for women across a wider age range (35-79) to detect the same number of cases would require 900,000 fewer women per year to be invited for screening (6.5 million).

The researchers also modelled how a similar approach might affect a national prostate screening programme, although this does not exist in the UK.

Lead author Dr Nora Pashayan of the PHG Foundation and a former CRUK training fellow commented: *"This is an alternative approach to screening and has the potential to reduce over-diagnosis, and in turn, lower costs. We're proposing that women would have a genetic test before the age of 35. This would be a simple blood test to identify genetic risk and, depending on the results, the age at which they should be invited for screening could be calculated. For some women this would be when they're 35, for others not until they're in their 50s or 60s or even later"*.

Dr Pashayan added: *"As more genetic information becomes available, the efficiency of screening approach that takes account of genetic risk will further improve"*.

Co-author Professor Paul Pharaoh, an expert in genetics from the University of Cambridge and a PHG Foundation Senior Fellow said: *"Our analysis shows that personalised screening has the potential to reduce the disadvantages of a screening programme without losing any of its benefits. We now need more research to find out what effect genetic testing would have on over-diagnosis and whether deaths from breast cancer would fall. We also need to consider the wider ethical and legal issues with more personalised screening"*.

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Notes to Editors

Publication reference

Polygenic susceptibility to prostate and breast cancer: implications for personalised screening. N Pashayan, SWDuffy, S Chowdhury, T Dent, H Burton, DE Neal, DF Easton, R Eeles and P Pharoah. *British Journal of Cancer* doi:10.1038/bjc.2011.118

About the PHG Foundation

- The PHG Foundation is a genetics policy think-tank and health service development NGO based in Cambridge, UK
- Our mission is *making science work for health* - identifying the best opportunities for 21st century genomic and biomedical science to improve global health, and to promote the effective and equitable translation of scientific innovation into medical and public health policy and practice
- We generate knowledge, evidence and ideas to inform, educate, and stimulate debate
- We also provide expert research, analysis, health services planning and consultancy services for governments, health systems, and other non-profit organisations
- For more information see www.phgfoundation.org

About COGS

- The Collaborative Oncological Gene-environment Study (COGS) is a project funded by the European Commission and 7th Framework Programme under grant agreement 223175 (HEALTH-F2-2009-223175)
- The aim of COGS is to define individual risk of breast-, ovarian- and prostate cancers, based on lifestyle factors and genetic variants, to improve identification of people at increased risk of these cancers, and prevention of disease
- For more information see www.cogseu.org

About Cancer Research UK

- Cancer Research UK is the world's leading cancer charity dedicated to saving lives through research
- The charity's groundbreaking work into the prevention, diagnosis and treatment of cancer has helped save millions of lives. This work is funded entirely by the public
- Cancer Research UK has been at the heart of the progress that has already seen survival rates double in the last forty years
- Cancer Research UK supports research into all aspects of cancer through the work of over 4,000 scientists, doctors and nurses
- Together with its partners and supporters, Cancer Research UK's vision is to beat cancer
- For more information see www.cancerresearchuk.org

The PHG Foundation is the working name of the Foundation for Genomics and Population Health, a charitable company registered in England and Wales, charity no. 1118664 / company no. 5823194.

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