World Health Organization

- *Non Communicable Disease Country Profiles*, 2014

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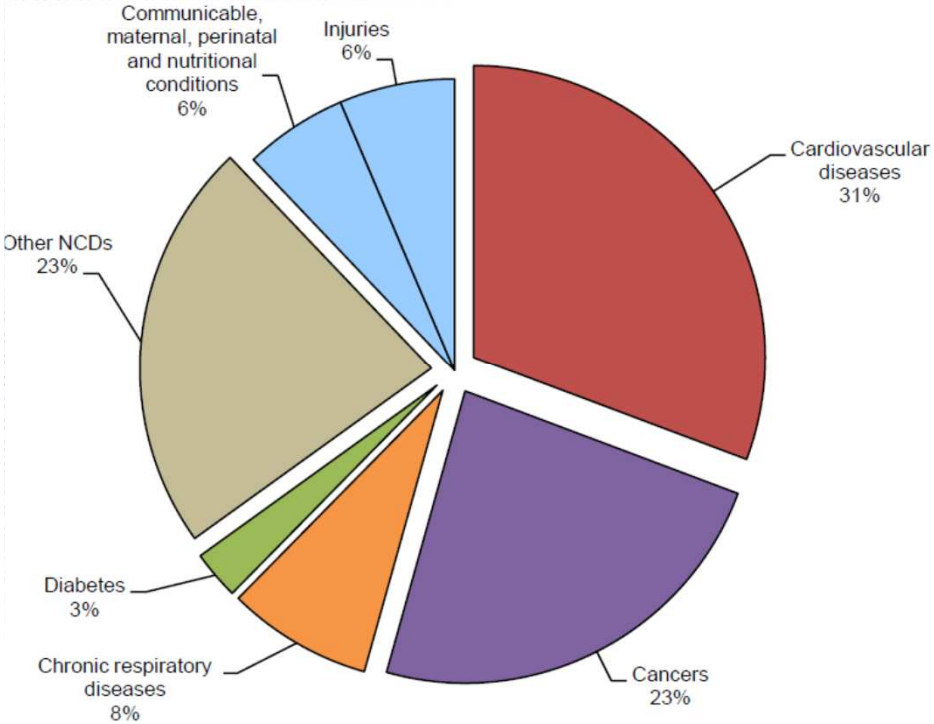
http://www.who.int/nmh/countries/usa_en.pdf



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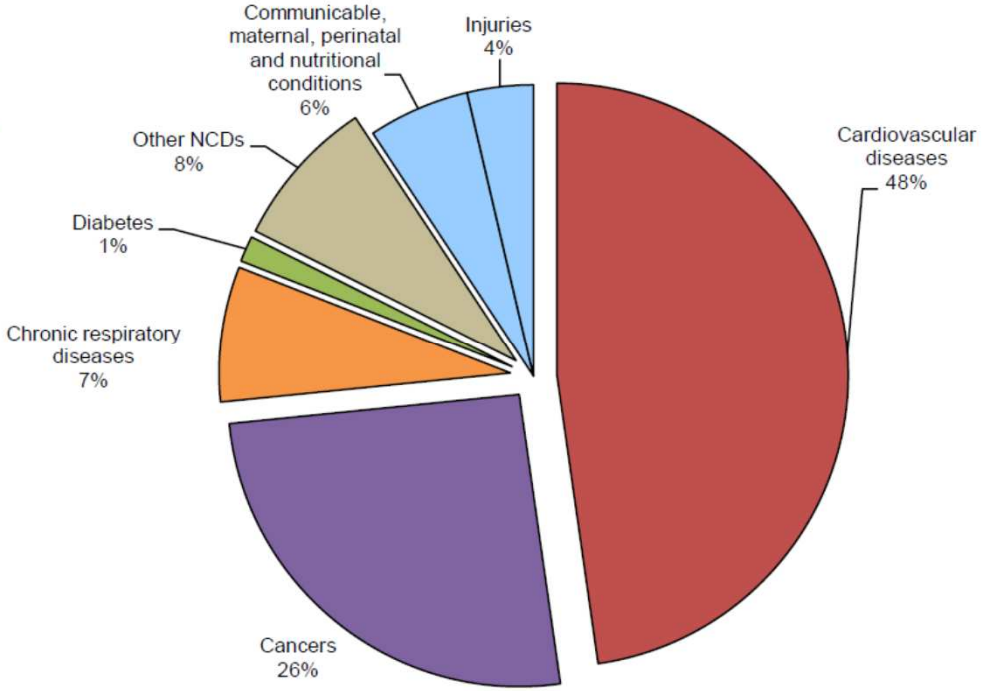

http://www.cancer.org/acs/groups/cid/documents/webcontent/003165-pdf.pdf

Breast Cancer Early Detection

The importance of finding breast cancer early

The goal of screening exams for breast cancer is to find cancers before they start to cause symptoms (like a lump that can be felt). *Screening* refers to tests and exams used to find a disease, such as cancer, in people who do not have any symptoms. *Early detection* means using an approach that lets breast cancer get diagnosed earlier than otherwise might have occurred.

Breast cancers that are found because they are causing symptoms tend to be larger and are more likely to have already spread beyond the breast. In contrast, breast cancers found during screening exams are more likely to be smaller and still confined to the breast. The size of a breast cancer and how far it has spread are some of the most important factors in predicting the *prognosis* (outlook) of a woman with this disease.

Most doctors feel that early detection tests for breast cancer save thousands of lives each year, and that many more lives could be saved if even more women and their health care providers took advantage of these tests. Following the American Cancer Society's guidelines for the early detection of breast cancer improves the chances that breast cancer can be diagnosed at an early stage and treated successfully.

Facts about mammography screening

- Benefits
  - Compare the breast cancer mortality in women who participate in screening to that of women who do not participate.
  - The raw result from four Swedish randomized trials for women between 40 and 74 years of age:
    - Out of 1,000 women who *did not* participate in mammography screening, 4 died of breast cancer.
    - Out of 1,000 women who *did* participate in mammography screening, 3 died of breast cancer.
  - *Absolute risk reduction*: Screening saved the life of 1 out of 1,000 women who participated in screening, a reduction of 0.1%.
  - *Relative risk reduction*: Screening saved the life of 1 out of 4 women who would otherwise have died from breast cancer, which is a reduction of 25%.

(Nyström et al., 1996, in Mühlhauser & Höldke, 1999):

- *Risks*
  - Psychological and physiological strain due to false positive results.
  - Radiation-induced breast cancer
    - It is estimated that out of 10,000 women, between 2 and 4 women who started to have annual mammograms at the age of 40 will develop radiation-induced breast cancer, and 1 to 2 of them will die (Mühlhauser & Höldke, 1999).
  - Unwanted early detection of precancerous lesions.
    - Because improved mammograms show lesions in ever more early stages of development, there is a danger of overtreatment (Napoli, 1997; Olsen & Gøtzsche, 2001)
  - Early detection of breast cancer does not equal longer life-expectancy (Gigerenzer, 2002; Karsa, 1995).
  - Test efficiency
  - Women who know that 9 out of 10 positive results later prove to be false positives might be less shaken by a positive mammogram than women who believe that a positive result indicates breast cancer with very high certainty (Gigerenzer, 2002; see also Marteau, 1995).

Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial

Anthony B Miller *professor emeritus*[1], Claus Wall *data manager*[1], Cornelia J Baines *professor emerita*[1], Ping Sun *statistician*[2], Teresa To *senior scientist*[3], Steven A Narod *professor*[1 2]

[1]Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario M5T 3M7, Canada; [2]Women's College Research Institute, Women's College Hospital, Toronto, Ontario M5G 1N8, Canada; [3]Child Health Evaluative Services, The Hospital for Sick Children, Toronto, Ontario, Canada

Abstract

Objective To compare breast cancer incidence and mortality up to 25 years in women aged 40-59 who did or did not undergo mammography screening.

Design Follow-up of randomised screening trial by centre coordinators, the study's central office, and linkage to cancer registries and vital statistics databases.

Setting 15 screening centres in six Canadian provinces,1980-85 (Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia).

Participants 89 835 women, aged 40-59, randomly assigned to mammography (five annual mammography screens) or control (no mammography).

Conclusion Annual mammography in women aged 40-59 does not reduce mortality from breast cancer beyond that of physical examination or usual care when adjuvant therapy for breast cancer is freely available. Overall, 22% (106/484) of screen detected invasive breast cancers were over-diagnosed, representing one over-diagnosed breast cancer for every 424 women who received mammography screening in the trial.

Introduction

Regular mammography screening is done to reduce mortality from breast cancer. Mammogram detected non-palpable breast cancers are smaller on average than clinically palpable breast cancers. Small breast cancers confer a better prognosis than large ones. However, survival in the context of a screening

Twenty five year follow-up for breast cancer incidence and mortality of the Canadian National Breast Screening Study: randomised screening trial

OPEN ACCESS

Anthony B Mill... rofessor
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Participants 89 835 women, aged 40-59, randomly assigned to mammography (five annual mammography screens) or control (no mammography).

Results During the five year screening period, 666 invasive breast cancers were diagnosed in the mammography arm (n=44 925 participants) and 524 in the controls (n=44 910), and of these, 180 women in the mammography arm and 171 women in the control arm died of breast cancer during the 25 year follow-up period. The overall hazard ratio for death from breast cancer diagnosed during the screening period associated with mammography was 1.05 (95% confidence interval 0.85 to 1.30). The findings for women aged 40-49 and 50-59 were almost identical. During the entire study period, 3250 women in the mammography arm and 3133 in the control arm had a diagnosis of breast cancer, and 500 and 505, respectively, died of breast cancer.

Regular mammography screening is done to reduce mortality from breast cancer. Mammogram detected non-palpable breast cancers are smaller on average than clinically palpable breast cancers. Small breast cancers confer a better prognosis than large ones. However, survival in the context of a screening

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Canadian National Breast Screening Study

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- The raw result for women between 40 and 59 years of age during the 5 year screening period :
  - Out of 1,000 women who *did not* participate in mammography screening, **4** died of breast cancer (171000/44910=3.81) .
  - Out of 1,000 women who *did* participate in mammography screening, **4** died of breast cancer (180000/44925=4.01).
- The raw result for women between 40 and 59 years of age during the 25 year screening period :
  - Out of 1,000 women who *did not* participate in mammography screening, **11** died of breast cancer (505000/44910=11.24) .
  - Out of 1,000 women who *did* participate in mammography screening, **11** died of breast cancer (500000/44925=11.13).

- **Conclusion:**
  - Annual mammography in women aged 40-59 ***does not*** reduce mortality from breast cancer beyond that of physical examination or usual care.
  - Overall, **22%** (106/484) of screen detected invasive breast cancers were **over-diagnosed**.

ΕΠΙΣΤΗΜΗ 13.02.2014 : 08:24 Η ΚΑΘΗΜΕΡΙΝΗ

Αμφιβολίες για τη μαστογραφία

GINA KOLATA / THE NEW YORK TIMES

Νέες αμφιβολίες για τη διαγνωστική αξία της μαστογραφίας γενά μία από τις μεγαλύτερες μελέτες που πραγματοποιήθηκε επί του αντικειμένου, με τη συμμετοχή 90.000 γυναικών και διάρκεια 25 ετών.

Οι ερευνητές του πανεπιστημίου του Τορόντο που εκπόνησαν τη μελέτη κατέληξαν στο συμπέρασμα ότι τα ποσοστά θανάτου από καρκίνο του μαστού και άλλα αίτια ήταν τα ίδια για τις γυναίκες που υποβάλλονταν σε τακτική μαστογραφία και γι' αυτές που δεν εξετάζονταν. Αλλωστε, σημειώνουν οι επιστήμονες, ο μαστογραφικός έλεγχος έχει τους δικούς του κινδύνους. Ο ένας στους πέντε καρκίνους που ανιχνεύεται με αυτήν την απεικονιστική μέθοδο δεν απειλεί τη γυναικεία υγεία και κατά συνέπεια δεν υπάρχει ανάγκη για χημειοθεραπεία, ακτινοβολίες ή χειρουργικές επεμβάσεις.

Η μελέτη, που δημοσιεύθηκε στην επιθεώρηση The British Medical Journal, είναι μία από τις πιο λεπτομερείς αξιολογήσεις της μαστογραφίας μέσα στο πλαίσιο των πιο σύγχρονων και αποτελεσματικών θεραπειών του καρκίνου του μαστού. Η μία ομάδα γυναικών που συμμετείχε στη μελέτη υποβαλλόταν σε μαστογραφία και ψηλάφηση, ενώ η δεύτερη μόνο σε ψηλάφηση. Στόχος των ερευνητών ήταν να διαπιστώσουν κατά πόσον ο εντοπισμός μη ψηλαφητών καρκίνων είχε ουσιαστικά οφέλη για την υγεία. Σύμφωνα με τους ερευνητές, η απάντηση είναι αρνητική.

BMJ 2012;345:e5660 doi: 10.1136/bmj.e5660 (Published 6 September 2012)

Exposure to diagnostic radiation and risk of breast cancer among carriers of BRCA1/2 mutations: retrospective cohort study (GENE-RAD-RISK)

Abstract

Objective To estimate the risk of breast cancer associated with diagnostic radiation in carriers of BRCA1/2 mutations.

Design Retrospective cohort study (GENE-RAD-RISK).

Setting Three nationwide studies (GENEPSO, EMBRACE, HEBON) in France, United Kingdom, and the Netherlands,

Participants 1993 female carriers of BRCA1/2 mutations recruited in 2006-09.

breast cancer (hazard ratio 1.90, 95% confidence interval 1.20 to 3.00), with a dose-response pattern. The risks by quarter of estimated cumulative dose <0.0020 Gy, ≥0.0020-0.0065 Gy, ≥0.0066-0.0173 Gy, and ≥0.0174 Gy were 1.63 (0.96 to 2.77), 1.78 (0.88 to 3.58), 1.75 (0.72 to 4.25), and 3.84 (1.67 to 8.79), respectively. Analyses on the different types of diagnostic procedures showed a pattern of increasing risk with increasing number of radiographs before age 20 and before age 30 compared with no exposure. A history of mammography before age 30 was also associated with an increased risk of breast cancer (hazard ratio 1.43, 0.85 to 2.40). Sensitivity analysis showed that this finding was not caused by confounding by indication of family history.

Conclusion In this large European study among carriers of BRCA1/2 mutations, exposure to diagnostic radiation before age 30 was associated with an increased risk of breast cancer at dose levels considerably lower than those at which increases have been found in other cohorts exposed to radiation. The results of this study support the use of non-ionising radiation imaging techniques (such as magnetic resonance imaging) as the main tool for surveillance in young women with BRCA1/2 mutations.

Main outcome measure Risk of breast cancer estimated with a weighted Cox proportional hazards model with a time dependent individually estimated cumulative breast dose, based on nominal estimates of organ dose and frequency of self reported diagnostic procedures. To correct for potential survival bias, the analysis excluded carriers who were diagnosed more than five years before completion of the study questionnaire.

Results In carriers of BRCA1/2 mutations any exposure to diagnostic radiation before the age of 30 was associated with an increased risk of

(GENEPSO; n=716 (36%)), the UK (EMBRACE[11]; n=688 (35%)), and the Netherlands (HEBON[12]; n=589 (30%)).

Each participant completed a standardised questionnaire (response rate 78%; see supplementary table A). Diagnoses of breast cancer were recorded through linkage with national registries or medical records.

Exposure to diagnostic radiation

Participants reported their history of exposure to diagnostic radiation in a detailed questionnaire containing indication based questions on lifetime exposure to fluoroscopy, conventional radiography of the chest/shoulders, mammography, computed tomography of the chest/shoulders, and other diagnostic procedures that use ionising radiation (such as bone scans) involving the chest or shoulders. Each section of the questionnaire provided a detailed description of the procedure and its most common indications. For fluoroscopy, radiography,

General health checks in adults for reducing morbidity and mortality from disease

Lasse T Krogsbøll[1], Karsten Juhl Jørgensen[1], Christian Grønhøj Lar

[1]The Nordic Cochrane Centre, Rigshospitalet, Copenhagen, Denma

Μια πιθανή βλάβη εξ αιτίας των προληπτικών (γενικών) διαγνωστικών εξετάσεων είναι η διάγνωση και θεραπεία καταστάσεων (παθήσεων) που δεν επρόκειτο να προκαλέσουν συμπτώματα ή θάνατο.

General health checks involve multiple tests in a person who does not feel ill with the purpose of finding disease early, preventing disease from developing, or providing reassurance. Health checks are a common element of health care in some countries. To many people health checks intuitively make sense, but experience from screening programmes for individual diseases have shown that the benefits may be smaller than expected and the harms greater. One possible harm from health checks is the diagnosis and treatment of conditions that were not destined to cause symptoms or death. Their diagnosis will, therefore, be superfluous and carry the risk of unnecessary treatment.

General health checks did not reduce morbidity or mortality, neither overall nor for cardiovascular or cancer causes, although the number of new diagnoses was increased. Important harmful outcomes, such as the number of follow-up diagnostic procedures or short term psychological effects, were often not studied or reported and many trials had methodological problems. With a large number of participants and deaths included, the long follow-up periods used, and considering that cardiovascular and cancer mortality were not reduced, general health checks are unlikely to be beneficial.

Οι προληπτικές (γενικές) διαγνωστικές εξετάσεις <u>δεν μείωσαν τη νοσηρότητα ή τη θνησιμότητα</u>, ούτε συνολικά αλλά ούτε και από καρδιαγγειακές αιτίες ή καρκίνο.

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