

# Overdiagnosis is a Significant Harm in Population-Based Mammography Screening

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## Current Situation regarding Breast Cancer

- By far the most common cancer in women globally<sup>1</sup>
- Increasing incidence observed with widespread mammography screening<sup>2</sup>
- The second most common cause of cancer death in Western women<sup>1</sup>
- Mortality rates have decreased significantly in the West, mostly due to treatment<sup>2</sup>
- Mammography screening programs were established based on the results of early randomized trials that reported up to 35% breast cancer mortality reduction
- Breast screening programs have been established in many developed countries including Canada, Australia, U.K., and many European countries. There is widespread opportunistic screening in U.S.

But! Current evidence no longer supports population-based mammography screening

## Latest Evidence from RCTs, Systematic Reviews, Meta-analyses and large Observational Studies

### No evidence of mortality reduction:

- Cochrane Collaboration systematic review<sup>3</sup>   RR .90 (.79-1.02)
- 25-year Canadian trial results (CNBSS, 2014)<sup>4</sup>   RR .99 (.88-1.12)
- 17-year U.K. New Age Trial results<sup>5</sup>   RR .88 (.74-1.04)
- No evidence in U.S. SEER data 2000-2010<sup>6</sup>
- No improvement in overall or disease-free survival in Hungary<sup>7</sup>

### Evidence of harm:

- **Overdiagnosis**
  - Up to 55% overdiagnosis in CNBSS<sup>8</sup>
  - 52% overdiagnosis estimated in a systematic review of 5 countries<sup>9</sup>
  - 40% of screen-detected breast cancers would have regressed<sup>10</sup>
  - Screened women in Hungary 6x more likely to be diagnosed with DCIS<sup>7</sup>
  - It is estimated only 15% of DCIS will progress to invasive cancer<sup>11</sup>
  - U.S. incidence rate would be 23% lower without screening<sup>12</sup>
- **Unnecessary treatment**
  - Treatment increases risk of death / Any treatment for overdiagnosis is harm
- **Radiation-induced risks**
  - Increased risk of breast cancer 27 (19-38) and death 4 (3-6) per 100,000 women 50-69 screened biannually<sup>13</sup>
- **False positives and additional workup**
  - 61% increase in RCTs of annual mammography over 10 years<sup>14</sup>
  - Up to 60% of women after 10 mammography screens<sup>15</sup>
- **Significant psychological distress**
  - Women may feel they have increased risk for breast cancer or that they have a potentially fatal disease

Women overestimate their risk of breast cancer and the benefit of mammography screening, and are unaware of the risks<sup>3, 16</sup>

### In Addition:

- Mammography screening **does not reduce advanced breast cancer**
  - 8 countries<sup>17</sup>, U.S. SEER data<sup>6</sup>, Denmark<sup>18</sup>, Norway<sup>19</sup>
- Mammography screening **increases incidence of mastectomy**
  - 300% in U.S.<sup>20</sup> 422% increase in U.K.<sup>21</sup>
- **Improved treatment and breast cancer awareness** responsible for most mortality reduction
  - Meta-analysis of 123 randomized trials<sup>22</sup>
  - **Greater mortality reduction among women not screened** in Denmark<sup>23</sup>, 30 European countries<sup>24</sup>, 3 pairs of European countries<sup>25</sup>
  - Improved treatment responsible for **2/3 reduction** in mortality<sup>26</sup>

## Screening Recommendations are Slow to Change

**IARC (2015):** 50-74 years of age<sup>27</sup>

**WHO (2017):** 50-69 in well-resourced settings

**USPSTF (2016):** 50-74 despite acknowledging no all-cause mortality reduction and breast cancer mortality reduction of only borderline statistical significance

**CTFPHC (2011):** 50-74; weak recommendation; update expected soon

**U.K. NHS:** 50-70 despite up to 19% overdiagnosis and increased risk of radiation-induced breast cancer (3-6/10,000 women screened triennially)<sup>28</sup>

**Swiss Medical Board (2013):** Recommended no new programs and a time limit be set on existing programs

This is an urgent public health issue  
Population-based mammography screening does not reduce overall mortality and can harm women. Women must be informed of the latest evidence so they can make an informed decision.  
Not doing so violates the legal and ethical tenets of informed consent.

## It is Critical to Assess for Conflict of Interest

### 15 years of systematic reviews regarding favourable recommendations:

- Clinicians were 2x as likely
- 100% with a declared conflict of interest
- Those without a competing financial interest were less likely<sup>29</sup>

### A review of the membership of guideline development panels:

- Authors frequently have financial conflicts of interest
- 11/12 guidelines reviewed did not report a conflict of interest
- A panel with 1+ radiologists more likely to recommend routine screening<sup>30</sup>

### A review of 12 U.S. cancer screening and prevention guidelines:

- 69% did not quantify or present benefits and harms in a comparable way<sup>31</sup>

### A review of 171 articles that reported on the Cochrane Collaboration Systematic Reviews (2001, 2006, 2009):

- Specialty medical journals were more likely to explicitly reject the findings, not report overdiagnosis and questionable or no breast ca mortality reduction<sup>32</sup>

### A recent review of websites of Canadian breast screening programs (in review<sup>33</sup>):

- No programs offered balanced information regarding benefits and harms

Despite vast evidence, there are differing interpretations that may be influenced by financial and professional interests

## Recommendations

- **Stop population-based mammography screening: WHO should convene an international symposium to plan a coordinated approach**
- **Redirect expenditures to surveillance of higher risk women, diagnostic workup, and treatment**
- **Educate general public and health professionals regarding overdiagnosis**
- **Provide information to women regarding potential harms and benefits including a clear statement on consent form**
- **Stop labeling DCIS and indolent lesions as ‘breast cancer’**
- **Shift to a ‘watchful’ waiting approach for DCIS and other indolent lesions**
- **Design mammo screening trials for higher risk women; watchful waiting**
- **Fund research regarding natural history for women of varying risk**
- **Fund research into effectiveness of CBE and BSE and other forms of cost-effective screening**
- **Assess all evidence for conflict of interest: All journals and expert panels should require disclosure reporting**
- **Consider biologic, psychological, interpersonal, social, and financial costs to women and families**
- **Consider economic / opportunity costs for health care system and society**

This poster is concerned with population-based mammography screening for women at average risk for breast cancer. It is not concerned with diagnostic mammography of symptomatic women or surveillance of higher risk women.

References: Please take a handout