

## **Update on Early Detection of Breast Cancer**

*A Position Paper based on Empowerment Seminar*

*Hong Kong Breast Cancer Foundation, 14 April 2013*

In view of the fact that breast cancer is the top cancer faced by one in nineteen women in Hong Kong, it is important for the community to be updated on various researches and their implications on how the disease may be detected early to optimize treatment effectiveness and to minimize pain and suffering. Breast cancer screening is one clear option. The captioned seminar was organized to an audience of about 200 members of the public invited through District Councillors, women organizations and Hong Kong Breast Cancer Foundation's members with a view to providing the update information in this regard through the sharing of clinical experts in the field of breast cancer care on the following topics:

**Dr Polly CHEUNG** (Founder, Hong Kong Breast Cancer Foundation)  
Global and local status of Breast Cancer and Screening

**Dr Gladys LO** (Radiologist In-Charge, Hong Kong Sanatorium & Hospital)  
Method of Breast Cancer Screening – the World Standard

**Dr Eliza FUNG** (Specialist in Radiology, Kwong Wah Hospital)  
Pioneer in Breast Cancer Screening - experience of TWGH

**Dr HUNG Wai Ka** (Medical Consultant in Breast Health Centre, HKBCF)  
Impact of opportunistic screening on Breast Cancer in Hong Kong

**Dr Bonita LAW** (Director of Breast Centre, Union Hospital)  
Breast Cancer Screening from women's perspective

**Prof Josette Sin-Yee CHOR** (Assistant Professor, School of Public Health, CUHK)  
Current Breast Cancer screening from Public Health perspective

This position paper was drafted by the Hong Kong Breast Cancer Foundation from the speeches of the speakers. Details of the talks can be accessed on our website [www.hkbcf.org](http://www.hkbcf.org).

# Breast Cancer Screening

Breast cancer is the third leading cause of death among women dying from cancer in Hong Kong. The incidence of female breast cancer in Hong Kong has tripled from 1993 to 2010, now reaching more than 3,000 cases each year. By calculation, 1.5 of the 8 women who are diagnosed with breast cancer every day will die of the disease. The median age of patients in Hong Kong is 53; 10 years younger than that of Caucasian woman patients.

Despite the alarming figures and the evident need for breast cancer screening, controversy remains over the feasibility and effectiveness of the practice. This paper fleshes out the pros and cons of implementing breast cancer screening in Hong Kong and argues that it should be launched in no time in Hong Kong for the welfare of women and the many men and children who depend on them.

## Breast cancer and screening in Hong Kong and worldwide

Worldwide, breast cancer affects 1.38 million people, taking away the lives of a third of them. Around 38% of the cases are found in Asia. Hong Kong, Singapore, Taiwan have the highest incidence in the region, and are considered as “medium-high incidence, low mortality districts” with an incidence of 54-59 per 100,000 women, well above the world average of 39.

While primary preventive measures emphasising a healthy lifestyle and dietary habit are no doubt important in helping women to stave off breast cancer, the benefits of secondary prevention using mammography screening have been proven and early detection is employed worldwide.

Population-wide breast cancer screening is currently available in 33 countries, according to the International Cancer Screening Network, a collaborative effort to evaluate and improve the process and outcome of screening. The screening, conducted every 2 years, is offered to women aged 50-69 to 40-75+. Early detection diagnoses 3 to 9 breast cancer cases out of every 1,000 women, and leads to a 20% to 38% reduction in mortality rate.

Singapore conducted a two-year pilot study of mammography screening in 1995-6 and concluded that the tests can help detect cancer at an early stage. The government announced its decision to fund a population-wide screening programme in 2002. In China, the Ministry of Health has provided funding support for a breast screening project in urban area since 2008. The programme is run by the China Anti-Cancer Association and aims to provide screening to 530,000 women in 30 provinces. From 2009-2011, the Chinese government spent 350 million Yuan on providing free cervical and breast screening; mammography screening was made available to 1.4 million women. In Taiwan, a pilot project to study the effectiveness of breast screening was introduced in 1998. To date, the Taiwan government has provided free mammography screening to all women aged 40-69, benefiting a total of 1.77 million women. Hong Kong has no population-based breast screening. Women who have attended for a mammogram at a screening centre have done so of their own volition. Among the 1.5 million women who are eligible for screening (aged 40-69) in Hong Kong, less than 5% have developed a screening habit.

## An internationally recognised method of breast cancer screening

### Mammography Saves Lives

There have been multiple randomised controlled trials evaluating screening mammography on patients in their 40s to 70s. The evidence overwhelmingly indicated a 26% to 30% reduction rate in mortality from breast cancer as a result of early detection.

Mammography is an X-ray technique to examine the breasts that entails gently compressing the breast tissue between two plastic plates, a process often made more comfortable with add-on soft mammopads. Two views of the breasts are obtained. Mammograms are generally not painful, and there is no problem imaging Chinese women with small breasts. Radiation-induced cancer from mammography exists only in theory and is extrapolated from high dose studies. No such cases have actually been reported. Actual radiation dose is approximately 0.3 to 0.4 mSv, compared to the annual 2 to 3 mSv of radiation derived from the everyday surroundings in Hong Kong.

Mammography has some limitations. Some patients have to be recalled for additional views, while others may have to be biopsied. A small percentage of cases of breast cancer may be overlooked if the breast tissue is too dense for effective screening. According to the US Preventive Service Task Force (USPSTF), mammogram screening may cause prolonged anxiety and worry over additional tests, biopsy or false positive results. There is also the possibility of over-diagnosis and over-treatment, and only 10% decrease has been recorded in the number of women diagnosed with late stage cancers. However, leading physicians have criticised the methodology and findings of the study. Dr. Pruthi from the Mayo Clinic says: “Physicians cannot distinguish between the dangerous breast cancers from the non-life-threatening ones, so annual mammogram remains the best option for detecting cancer early and reducing the risk of death from breast cancer”. The Cochrane Collaboration Review on mammographic screening argues that “there is no benefit in all-cause mortality, despite benefit in breast cancer mortality.” Professor SW Duffy, a mathematics professor from Lincoln’s Inn Fields, London, says the authors had “heavy reliance on arbitrary principles and were unable to perform an adequate unbiased review of the material”.

### Breast cancer risks in women and screening recommendations from American College of Radiology (ACR) and American Cancer Society (ACS)

% of Women	Category	Description	Mammographic guidance
~80%	Average risk	Women with no identifiable risk factor	ACR & ACS Annual Mammographic screening at age 40
~15%	Moderately increased risk	15% to 20% lifetime risk of breast cancer. <ul style="list-style-type: none"><li>● Women with biopsy proven lobular</li></ul>	ACR (American College of Radiology): <ul style="list-style-type: none"><li>● Annual mammography screening at time of diagnosis.</li></ul>

		<ul style="list-style-type: none"> <li>hyperplasia,</li> <li>● Atypical ductal hyperplasia (ADH),</li> <li>● Ductal carcinoma-in-situ (DCIS),</li> <li>● Invasive breast or ovarian carcinoma regardless of age.</li> </ul>	<ul style="list-style-type: none"> <li>● Consider annual MRI.</li> </ul> <p>ACS (American Cancer Society):</p> <ul style="list-style-type: none"> <li>● Annual mammography screening at time of diagnosis.</li> <li>● Talk to clinician about MRI.</li> </ul>
~5%	High risk	<p>&gt;20% lifetime risk of breast cancer.</p> <ul style="list-style-type: none"> <li>● BRCA 1, BRCA 2 gene mutation.</li> <li>● Positive family history for BRCA gene mutation but untested themselves.</li> <li>● Positive family history for first degree relative with premenopausal breast Ca or ovarian Ca.</li> <li>● History of mantle radiation (Hodgkins disease) between 10 and 30 years.</li> </ul>	<p>ACR &amp; ACS:</p> <ul style="list-style-type: none"> <li>● Start annual mammographic screening at age 30 or 10 years earlier than when the youngest relative was diagnosed with breast cancer.</li> <li>● Start annual mammogram 8 years after irradiation but not earlier than 25 years of age for mantle radiation patients.</li> <li>● Add annual MRI starting at age 30.</li> </ul>

Screening Mammography is recommended for women in all categories from average to high risk . No other imaging examination can replace mammography, be it Ultrasound, MRI, Nuclear Medicine, Sestamibi, PET scan, Positron Emission Mammography (PEM), or Thermography and Electrical impedance examinations. Mammography is the only imaging modality proven to reduce mortality from breast cancer.

## **A pioneer in breast cancer screening: the experience of Tung Wah Group of Hospitals**

After a two-year pilot study in 1991-2 at Kwong Wah Hospital, the Tung Wah Group of Hospitals (TWGH) put in place the mammogram screening service in the two Well Women Clinics in 1993. The screening programme is well received by women in Hong Kong, with the number of women being screened at Kwong Wah and Tung Wah Eastern hospitals increasing from 3,163 in 1993 to 18,781 in 2011.

The women who had mammograms showed no symptoms; so far 1,068 breast cancer cases have been detected. The crude cancer detection rate of 5.2 per 1000 lies within the international recommendation. Among the patients being diagnosed, 81.5% were in stages 0-1 and 52.6% of the cancers detected were

minimal in size (<1.5 cm). These figures are well above the international recommendation of > 50% and > 30% respectively.

There are some concerns about the use of mammograms in causing false positive results and the need for additional imaging, which creates anxiety to the patients and their family. The overall recall rate of the screening programme at TWGH is 8.8%, which falls within the international standard of < 10%. The positive predictive value based on abnormal screening is 5.8%, which is also within the international recommendation of 5-10%.

The reasons for success of the screening programme are three-fold. (1) The presence of a dedicated and experienced team of doctors, radiographers and nurses is crucial; the quality of service is further enhanced by the weekly multidisciplinary mammogram meetings during which the team discusses abnormal mammograms and their outcome. (2) The screening centre is equipped with state-of-the-art technology such as Digital Mammography, Breast Tomosynthesis and Computer Aid Detection Programme. (3) There is also continuous upgrade of services such as electronic mammogram reporting for audit and data analysis.

## **Impact of opportunistic screening of breast cancer in Hong Kong**

Since the launch of the first opportunistic mammogram screening programme in the early 1990s, the pattern of breast cancer has shifted to an earlier staging. According to the data compiled by the Hong Kong Breast Cancer Foundation's Breast Cancer Registry – the largest collection in Hong Kong to date – screen-detected cancers are associated with earlier staging, smaller tumour size, more breast conserving surgery, less nodal involvement and less use of chemotherapy. Women in Hong Kong should be informed of the benefits and potential harm of breast screening and decide themselves whether they want to join the screening programme or not. In any event, quality assured screening programmes should be made available to women in need.

In May 2011, the Hong Kong Breast Cancer Foundation established the HKBCF Breast Health Centre with funding support from the Hong Kong Jockey Club Charities Trust. Since its inception, the community-based centre has held outreach breast health education sessions for 27,500 women in over 16 districts in Hong Kong. Breast screening was provided to 9,550 women as at 31 Mar 2013, 41% of whom came from an economically-disadvantaged background. Of the 165 cancers detected, the cancer detection rate was 0.6% among women with no symptoms and 5% among those who were ignorant of their symptoms of breast cancer. The figures were in line with those collected in overseas screening programmes. They also reflected the prevalence of breast cancer in the community and the high demand for focused breast health services.

The HKBCF Breast Health Centre is a model for high-quality, well-organised, audited and affordable breast cancer screening programmes for women in Hong Kong. It has succeeded in raising breast cancer awareness especially among women from low-income families, filling the gap in breast health care service and benefiting the community at large.

## **Breast cancer screening: women's perspective**

Women are naturally concerned about the risks of breast cancer screening, including the likelihood of false positive results that occur at the incidence of 50-200 per 1,000 screens. Studies have shown that women would accept the possibility of false positive results proven to be cancerous or not, rather than to miss a true positive cancer diagnosis.

Another cause of concern is over-diagnosis, which refers to the detection of cancers from screening that can never cause death if left alone. It implies unnecessary intervention and surgery, and the anxiety and complications associated with it. The actual rate of over-diagnosis can hardly be measured but has been estimated at around 24%. For every 2 over-diagnoses 1 breast cancer life can be saved. In a study (see reference) of women being screened, 87% of women believe screening is a good idea and 56% would like to be screened even for slow growing cancers. Informed consent with the pros and cons explained helps women to reach a decision.

## **Breast cancer screening: the public health perspective**

A successful population-wide screening programme like cervical screening saves many lives. Early treatment of a potentially lethal disease comes with less aggressive treatment, which prolongs the life expectancy and improves the quality of life of patients. All screening, on the other hand, can be potentially harmful because it is implemented in an apparently healthy population. False positive results can inflict stress and unnecessary treatment in women. However, benefits must outweigh the risks in any screening programme. Admittedly, population-based screening requires enormous resources but the latter must be compared to that which is being invested to treat breast cancer patients who are diagnosed late. Careful consideration is necessary to plan and implement a screening programme.

Breast cancer is a serious health problem in women. Breast screening has been implemented in more than 30 countries all over the world and proven to reduce breast cancer mortality. Whether breast screening should be implemented in Hong Kong has always been a controversial issue despite the increasing popularity and demand for the service among younger women. The view of the Cancer Expert Working Group (CEWG), based apparently on update science and researches, is not in favour of population-wide screening in Hong Kong. However, based on the Wilson & Jungner criteria put forward by the World Health Organisation, which fleshes out the various conditions that are suitable for screening, it is appropriate to carry out breast screening in Hong Kong as far as the available data indicate. Unfortunately, the validity of the data in the Hong Kong context has been criticized since they are collected from overseas and may not represent the picture in Hong Kong. Local feasibility study is therefore urgently needed to address this important public health problem.

## **Conclusion**

Given the high incidence of breast cancer in Hong Kong, it is the responsibility of the Government to give priority to the disease in its public health policy. To say the least, it should inform and empower women to be breast aware. Furthermore, based on the screening data from various countries and local economic situation, the World Health Organization has recommended that mammography screening should be provided in countries with good health infrastructure, while in low and middle-income

countries awareness of early signs should be promoted and screening by clinical breast examination be carried out.

Hong Kong is an economically advanced region. There is an urgent need to address the rising burden of breast cancer in Hong Kong and devise better control measures for early detection and intervention. The following measures are recommended:

1. Enhance breast health education and breast cancer awareness in the community.
2. Provide access to women who opt for screening. More screening centres with quality assured, audited and organised screening programmes should be set up.
3. Local studies on the feasibility of population-based screening should be conducted as soon as possible.
4. Publicise more on CEWG's view and recommendations relevant to breast cancer, and consider widening its engagement of professionals and community on one-off or on-going bases.

## References

1. American Cancer Society. Cancer Screening Guidelines: American Cancer Society Guidelines for the Early Detection of Cancer. Last medical review: 04/23/2013. Last Revised: 05/03/2013.
2. Australian Institute of Health and Welfare 2009. BreastScreen Australia monitoring report 2005-2006. Cancer series no. 48. Cat. No. CAN 44. Canberra: AIHW.
3. Beckett JR, Kotre CJ and Michaelson JS. Analysis of benefit: risk ratio and mortality reduction for the UK Breast Screening Programme. *Br J Radiol.* 2003 May;76(905):309-20.
4. Biesheuvel C, Weigel S and Heindel W. Mammography screening: evidence, history and current practice in Germany and other European countries. *Breast Care (Basel).* 2011;6(2):104-109.
5. Bihrmann K, Jensen A, Olsen AH, et al. Performance of systematic and non-systematic ('opportunistic') screening mammography: a comparative study from Denmark. *J Med Screen.* 2008;15(1):23-6.
6. Bryant H and Mai V. Impact of age-specific recommendation changes on organized breast screening programs. *Prev Med.* 2011 Sep;53(3):141-3.
7. Department of Health, Executive Yuan, Republic of China. 2011 Taiwan Public Health Report. Assessed at: [http://www.doh.gov.tw/ufile/doc/Taiwan\\_Public\\_Health\\_Report2011.pdf](http://www.doh.gov.tw/ufile/doc/Taiwan_Public_Health_Report2011.pdf).
8. Epidemiology & Disease Control Division. Ministry of Health, Singapore. National Health Surveillance Survey 2007.
9. Evans A and Whelehan P. Breast screening policy: are we heading in the right direction? *Clin Radiol.* 2011 Oct;66(10):915-9.
10. Fletcher SW. Breast cancer screening: a 35-year perspective. *Epidemiol Rev.* 2011 Jul;33(1):165-75.
11. de Gelder R, Bulliard JL, de Wolf C, et al. Cost-effectiveness of opportunistic versus organized mammography screening in Switzerland. *Eur J Cancer.* 2009 Jan;45(1):127-38.
12. GLOBOCAN 2008, International Agency for Research on Cancer. Cancer Fact Sheet. Assessed at: <http://www.globocan.iarc.fr/factsheet.asp>
13. Hellquist BN, Duffy SW, Abdsaleh S, et al. Effectiveness of population-based service screening with mammography for women ages 40 to 49 years: evaluation of the Swedish Mammography Screening in Young Women (SCRY) cohort. *Cancer.* 2011 Feb 15;117(4):714-22.
14. Hendrick RE. Radiation doses and cancer risks from breast imaging studies. *Radiology* 2010; Oct 257(1): 246-53.
15. Hendrick RE, Klabunde C, Grivegne A, et al. Technical quality control practices in mammography screening programs in 22 countries. *Int J Qual Health Care.* 2002 Jun;14(3):219-26.



16. Hersch J, Jansen J, Irwig L, et al. How do we achieve informed choice for women considering breast screening? *Prev Med*. 2011 Sep;53(3):144-6.
17. Hong Kong College of Radiologists Mammography Statement. 9 May 2006.
18. Johns LE and Moss SM; Trial Management Group. Randomized controlled trial of mammographic screening from age 40 ('Age' trial): patterns of screening attendance. *J Med Screen*. 2010;17(1):37-43.
19. Kalager M, Zelen M, Langmark F, et al. Effect of screening mammography on breast-cancer mortality in Norway. *N Engl J Med*. 2010 Sep 23;363(13):1203-10.
20. Klabunde CN, Sancho-Garnier H, Taplin S, et al. Quality assurance in follow-up and initial treatment for screening mammography programs in 22 countries. *Int J Qual Health Care*. 2002 Dec;14(6):449-61.
21. Lam HS. Updates in breast cancer screening. *J HK Coll Radiol* 2004;7:171-180.
22. Law J and Faulkner K. Cancers detected and induced, and associated risk and benefit, in a breast screening programme. *Br J Radiol*. 2001 Dec;74(888):1121-7.
23. Lee CH, Dershaw DD, Kopans DD, et al. Breast cancer screening with imaging: recommendations from the Society of Breast Imaging and the ACR on the use of mammography, breast MRI, breast ultrasound, and other technologists for the detection of clinically occult breast cancer. *J Am Coll Radiol*. 2010 Jan;7(1):18-27.
24. Lehman CD, Isaacs C, Schnall MD, et al. Cancer yield of mammography, MR and US in high-risk women: prospective multi-institution breast cancer screening study. *Radiology*. 2007; Aug;244(2):381-8.
25. Leung AW, Mak J, Cheung PS, et al. Clinicopathological correlates in a cohort of Hong Kong breast cancer patients presenting with screen-detected or symptomatic disease. *Hong Kong Med J*. 2007 Jun;13(3):194-8.
26. Miles A, Cockburn J, Smith RA, et al. A perspective from countries using organized screening programs. *Cancer*. 2004 Sep 1;101(5 Suppl):1201-13.
27. Moss SM, Cuckle H, Evans A, et al. Effect of mammographic screening from age 40 years on breast cancer mortality at 10 years' follow-up: a randomized controlled trial. *Lancet*. 2006 Dec 9;368(9552):2053-60.
28. National Cancer Institute. International cancer screening network. Breast Cancer Screening Programs in 26 ICSN Countries, 2012: Organization, Policies, and Program Reach. Accessed at : <http://appliedresearch.cancer.gov/icsn/breast/screening.html>.

29. Perry N, Broeders M, de Wolf C, et al. European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth edition – summary document. *Ann Oncol*. 2008 Apr;19(4):614-22.
30. Ramos M, Ferrer S, Villaescusa JI, et al. Use of risk projection models to estimate mortality and incidence from radiation-induced breast cancer in screening programs. *Phys Med Biol*. 2005 Feb 7;30(3):505-20.
31. Rosenberg RD, Yankaskas BC, Abraham LA, et al. Performance benchmarks for screening mammography. *Radiology*. 2006 Oct; 241(1):55-66.
32. Saslow D, Boetes C, Burke W, et al. American Cancer Society guidelines for Breast Screening with MRI as an adjunct to mammography. *CA Cancer J Clin*. 2007 Mar-Apr; 57(2):75-89.
33. Schqartz LM, Woloshin S, Sox HC, et al. US women's attitudes to false positive mammography results and detection of ductal carcinoma in situ: cross sectional survey. *BMJ*. 2000 Jun 17;320(7250):1635-40.
34. Stout NK, Rosenberg MA, Trentham-Dietz A, et al. Retrospective cost-effectiveness analysis of screening mammography. *J Natl Cancer Inst*. 2006 Jun 7;98(11):774-82.
35. US Preventive Services Task Force. Screening for breast cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2009 Nov 17;151(10):716-26, W-236.
36. Vogel VG. Breast cancer prevention: a review of current evidence. *CA Cancer J Clin*. 2000 May-Jun;50(3):156-70.
37. Woloshin S and Schwartz LM. The benefits and harms of mammography screening: understanding the trade-offs. *JAMA*. 2010 Jan 13;303(2):164-5.
38. World Health Organization, 2013. Breast cancer: prevention and control. Assessed at: <http://www.who.int/cancer/detection/breastcancer/en/> .