MINI-REVIEW

Opportunity for Breast Cancer Screening in Limited Resource Countries: a Literature Review and Implications for Iran

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Abstract

Young age at occurrence and advanced tumour stage at diagnosis should urge health policy makers to focus on strategies that will help to reduce breast cancer burden in Iran. However, fundamental knowledge to select the optimal control strategy is limited. In this review paper we summarize considerations for launching a successful mass screening program in Iran using a thorough search of the literature focusing on screening activities for breast cancer in limited resource countries (LRCs). The Pubmed and Web of Knowledge databases were used for literature searches with the terms "breast neoplasm" and "screening" in combination with "limited resource countries", or "developing countries" . In addition, the bibliographies of selected references were also searched and utilized. More than 200 articles were found from 2005 to June 2011, of which 96 met the inclusion criteria. Papers were reviewed and categorized as follows: necessity and adoption of screening guidelines in LRCs (n=44); pilot implementation and barriers to screening program in LRCs (n=25); knowledge and attitudes on breast cancer and screening behaviour in LRCs (n=27). The results of the reviewed studies show that the rising trend of breast cancer incidence in LRCs has made it a health priority. Financial constraints to implement mammography screening in LRCs promote the use of alternative but less accurate screening modalities such as physical breast examination. Starting a breast cancer screening program in LRCs faces several challenges related to country's resources status, health service capacity and community awareness. Conservative attitudes toward women, fatalism and misconception on breast cancer risk factors and screening behaviour could seriously prohibit women's participation. In conclusion, given the lack of quantitative information and implementation research on breast cancer control in Iran, our ability to give a clear advice for breast cancer screening in Iran is limited. Iran should adopt a tailor-made strategy for mass screening with great emphasis on reducing the number of advanced stage tumours or "down-staging". Combination of two approaches, clinical breast examination (CBE) and mammography would be promising given the increased competence of health care professional and public awareness. Equally important, a control plan should be started small and expanded gradually.

Keywords: Breast cancer - screening - limited resource countries - Iran

Introduction

Similar to other limited resource countries (LRCs), the yearly incidence rate of breast cancer in Iran is low, 25.1 per 100,000 women, in comparison to Western countries (Mousavi et al., 2007). In the Netherlands, for example, the world standardized rate in the year that the national screening program started (1989) was 71.4 per 100,000 (Comprehensive Cancer Centre, 2010). In recent years, breast cancer incidence in Iran has shown an alarming rise; the age standardized incidence rate almost doubled from 12.4 in 2003 to 25.1 per 100,000 women in 2006 (Rezvani et al., 2009).

As in other developing countries, the median age of breast cancer in Iran is at least one decade earlier than in Western countries due to shorter life expectancy of Iranian women compared to Western populations (Mousavi et al., 2007). A similar age pattern is reported from the first generation among Iranian female immigrants to Western countries (Yavari et al., 2006; Mousavi et al., 2010). In addition, the majority of patients in Iran present with disease at advanced stage (Harirchi et al., 2009). Due to absence of an active cancer registry, national mortality and survival data from breast cancer in Iran are not available. Local registries and hospital-based studies, however, have reported a breast cancer mortality of 2.5 to 5.8 per 100,000 and 5-year survival rates of 60% to 75% (Mousavi et al., 2006; 2007; Rezaianzadeh et al., 2009). Although up-to-date treatment modalities are often used in Iran, the high prevalence of advanced stage tumour at diagnosis means

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that long-term survival of breast cancer is low compared to Western countries.

A recent report from the Centre for Disease Control and Prevention of the Ministry of Health in Iran pleaded for screening activities to counter the increasingly heavy burden and premature mortality caused by breast cancer (Mousavi et al., 2008). The report shows that health policy makers have a preference for mass screening. However, despite extensive efforts by several research groups on breast cancer in Iran, sufficient data for decision making on whether or not to initiate a mass screening program are not available. Results of a trial on comparison of screening modalities in Yazd, a central province in Iran, are eagerly awaited but not available yet (Miller, 2008). The aim of this review is to explore the available literature and summarize considerations for launching a successful mass screening program in LRCs. The results from similar settings, in terms of resources and social factors help policy makers to address these obstacles in advance. The implications of these findings together with the recommendations issued and recently updated by the Breast Global Health Initiative (BGHI) (Anderson et al., 2011; Cazap et al., 2011; Harford et al., 2011; Yip et al., 2011) will be discussed for Iran.

Literature Search

Several LRCs have performed and published studies on aspects of screening for breast cancer. We therefore reviewed and summarized the more recently published studies to identify strategies and potential barriers for breast cancer screening implementation in developing countries. Two databases were used for the literature search: PubMed and Web of Knowledge (Science). The terms "breast neoplasm" [MeSH] and "early detection" [MeSH] or "screening" in combination with "limited resource countries", or "developing countries" [MeSH] were used. The bibliographies of selected references were also searched. More than 200 articles were found from 2005, when the first resource-based recommendation from the BGHI summit (Anderson et al., 2006) became available, to June 2011, of which 96 met the inclusion

criteria. Studies were excluded if they described only disease or patient characteristics. The full papers were reviewed and summarized by the first author. Papers were categorized according to the following inclusion criteria: I) necessity and adoption of screening guidelines in LRCs (n=44); II) pilot implementation and potential barriers for a screening program in LRCs (n=25); and III) knowledge and attitudes on breast cancer and screening behaviour in LRCs (n=27). Study results of the papers in categories III are summarised in Table 1. Table 2 represents our analysis of country-specific opportunities and challenges for breast cancer screening in Iran compared to the BGHI's recommendations (Anderson et al., 2011; Cazap et al., 2011; Harford et al., 2011; Yip et al., 2011).

Findings

Group I: Necessity and adoption of screening guidelines in LRCs

Breast cancer has become a health priority in most developing countries due to increasing incidence, lack of early detection and timely treatment opportunities for diagnosed cases (IARC, 2008). This demands specific strategies to reduce disease burden in these particular regions. However, either due to limited resources or little available data on the burden of disease, breast cancer control strategies have not been paid sufficient attention to so far various studies highlighted the necessity for breast cancer screening to prevent premature deaths due to advanced tumour stage at diagnosis among women in LRCs (El-Saghir et al., 2005; Anderson et al., 2006; 2011; Badar et al., 2007; El-Saghir et al., 2007; Omar, 2007; Tan et al., 2007; Agrawal and Ramakant, 2008; 2010; Anderson and Jakesz, 2008; El-Saghir, 2008; Igene, 2008; Kantelhardt et al., 2008; Masood, 2007; Salem et al., 2008Moss, 2008; Coughlin and Ekwueme, 2009; Singh, 2009; Webb, 2009; Anderson, 2010; Batsis, 2010; Gadgil and Roy, 2010; Galukande et al., 2010; Miller, 2010; Sankaranarayanan and Bofetta, 2010; Tfayli et al., 2010; Cazap et al., 2011; Harford et al., 2011; Yip et al., 2011; Gupta, 2010; Wadler et al., 2011). Global evidence-based guidelines for breast cancer control are designed

Table1. Summary of Papers Focusing on Knowledge, Attitude and Practice of Breast Cancer Screening in LRCs Published in the Period 2005-2011

Country (authors)	Main findings
Iran (Harirchi et al., 2009; Simi et al., 2009; Montazeri et al., 2008; Masoumi et al., 2007; Heidari et al., 2007; Parsa et al., 2005)	-*Knowledge* of breast cancer (risk factors, symptoms and early detection methods): 83%-72% -*Attitude* on breast cancer screening: >80% -*Practice*: 4%-70% (BSE); 4%-17% (CBE); 1%-10% (Mammography)
Nigeria (Akhigbe et al., 2009; Ibrahim et al, 2009; Temitope et al., 2007; Aderounmu et al., 2006; Kayode et al., 2005; Balogun et al., 2005)	-*Knowledge* of breast cancer (risk factors, symptoms and early detection methods): 20%-95% -*Attitude* on breast cancer screening: data not available -*Practice*: 18%-85% (BSE); 10% (CBE); 8% (Mammography)
Turkey (Nur, 2010; Karayurt et al., 2008)	-*Knowledge* of breast cancer (risk factors, symptoms and early detection methods): 2%-52% -*Attitude* on breast cancer screening: data not available - *Practice*: 7%-44% (BSE); 22% (CBE); 38% (Mammography)
Pakistan (Maqsood et al., 2009)	- *Knowledge* of breast cancer (risk factors, symptoms and early detection methods): 35%-84% -*Attitude* on breast cancer screening: 85% -*Practice*: 37% (BSE); 7% (CBE); 5% (Mammography)
India (Gilani et al., 2010)	- *Knowledge* of breast cancer: 50% - *Attitude* on breast cancer screening: 90% - *Practice*: 28% (BSE)

Table 2. Comparison of Opportunities for Breast Cancer Screening Programs in Iran and Recently Published Recommendations by the Breast Health Global Initiative (BHGI)

Recommendations	Opportunities for Iran	Suggestions
Burden of breast cancer	A national pathology-based cancer registry has been started since 2004, in cooperation with IARC. Several regional cancer registries exist, in south, North, North-East, Capital city and Centre part Reasonable quality of hospital records Many surveys conducting by Medical universities and affiliated institutes National Organization for Civil Registration (NOCR) exists since 1964 (recording death) "Mortality recording" project in most regions is running to determine cause-specific rates since 1997	Pool data from different sources to project statistics *Documentation of research organized by different organizations such as: hospital, medical universities and other health institutes to prevent duplication efforts* *Strengthen collaboration between programming and research*
Program organization	A national council for cancer control exist in the Ministry of Health Cancer specific centres are available in big cities Reasonable number of expert health professional (oncologists, surgeons, nurses) Availability of an organized Health Network System with dedicated workers (Behvarz) in surrounding areas and possibility to integrate awareness campaign or scale up the program. Increased international cooperation for knowledge and technology transfer. Opportunity for refreshing courses exists.	*Distribution of cancer centre should be equal (at least between and within provinces)* Promote health professionals for working outside of the Capital city Integrate breast cancer control into the Health Networks (which have excellent experience for national vaccination and maternal health program) Health professionals should be trained adequately and refresh their knowledge by short courses or onsite training (cooperation with international professionals)
Payment policy	Health services are mostly financed by the government Several supporter organizations cover medical expenses of women with low incomes Several nongovernmental organization (NGO) exist	*Define clear, consistent and detailed dialogues to communicate with different organizations involved in the project* Promote cooperation with International agencies such as IARC, WHO, INCTR*
Implementation research	Increasing number of studies due to increasing research funding at medical universities and research institutes	*Release more updated research priorities and provide to all related institutes by Council of Cancer Control* *Define a unique centre which is responsible to register projects focusing on breast cancer control*
Training	Opportunity for both abroad and onsite training are available	*Promote educated people for coming back from abroad*
Public awareness	Many descriptive studies have already described for example low awareness rates among subgroup of women in Iran (women in different areas, with different religious or cultural believes) Percentage of educated women is rising, give them more opportunity to being more aware Some alternatives methods exists to increase women's knowledge, such as using SMS message Currently few programs focusing on health lifestyle is running in big cities. These studies increase community awareness about risk life style such as obesity which can be also used as a primary prevention for breast cancer	*National awareness campaign should be established* *Integrate breast cancer campaign with the Literacy campaign (has been started 25 years ago)* *Use of Short Message System (SMS) which is available in all areas* Establish patients networks with the help of NGO and charities Integration of breast cancer awareness (risk factors) with other projects like Health-Heart in big cities

Italic points presents the most important activities that should be performed to meet recommendation; *INCTR, international network for cancer treatment and research

based on disease and population characteristics in Western countries. As both breast cancer features and demographic characteristics of populations in LRCs are greatly different from Western countries, the screening landscape will vary. Screening programs in Western countries mainly focus on finding asymptomatic tumours, while for most LRCs early detection of palpable tumours is of prime concern (Miller, 2010). Therefore, it is critically important to modify global evidence-based guidelines to the country's situation (Smith et al., 2006; Webb, 2009). However, limited data on disease burden and cost-effectiveness of screening modalities in LRCs poses enormous challenges to define an effective controlling strategy. The Breast Health Global Initiative (BHGI) group attempts to define and specify resource sensitive solutions and guidelines of breast cancer control in LRCs. The BHGI developed its

first set of adopted resource- sensitive guidelines for LRCs in the availability of diagnostic and treatment facilities, and competitive health priorities in 2005 (Anderson et al., 2006; Anderson et al., 2006; Anderson and Carlson, 2007; Anderson and Tsu, 2008; Anderson and Ozman, 2008; Anderson et al., 2007; Shyyan et al., 2008; Yip et al., 2008; Harford et al., 2008; Salim et al., 2009; Anderson and Cazap, 2009). In consecutive updates, most recently in 2010, the BHGI developed modified guidelines on optimisation of breast cancer management in low-resource and middle-resource countries (Harford et al., 2010; 2011; Anderson et al., 2011; Cazap et al., 2011; Yip et al., 2011).

A large body of papers from Group I have focused on general recommendations and needs for tailored methods to intensify breast cancer control in LRCs. LRCs share similarities in disease patterns, financial and populationcharacteristics, however they may differ in factors that affect adoption and implementation processes. As Anderson and colleagues suggested, it is necessary to look more closely at a given country to best direct the screening program (Anderson et al., 2011).

Group II: Pilot implementation and potential barriers to breast cancer screening in LRCs

We found a variety of papers which focused on the evaluation of pilot studies and national programs of breast cancer screening using mammography and/or physical breast examination in LRCs such as Egypt (Boulos et al., 2005), Colombia (Muritto et al., 2008), Lebanon (Salim et al., 2009), India (Mittra et al., 2010), Palestine (Cohen and Azaiza, 2010), the Philippines (Pisani et al., 2006), Taiwan (Wu et al., 2006), Mexico (Knaul et al., 2009), Brazil (Caleffi et al., 2010), Pakistan (Baig and Ali, 2006) and Nepal (Tara et al., 2008). The outcome and efficacy of the programs varied depending on the screening modality, type of screening and the compliance rate of the target population. For instance, a high compliance rate in the national screening program in Egypt due to a useful way of home visits by social workers, yielded acceptable compliance results for the first phase of screening, 60% of 4116 invited women (Miller, 2008).

A similar strategy using of a mobile unit, was also suggested for the screening program in Brazil, where the majority of women are illiterate and have less awareness of breast cancer, with attendance rate of near 50% (Mauad et al., 2009). The results from the Egyptian and Taiwanese controlling program indicate that using two- phase screening, starting with CBE and continuing with mammography in case of suspected findings, could increase the overall effectiveness of the program in countries with low to medium risk of breast cancer (Wu et al., 2006; Bastis, 2010).

Perhaps the greatest obstacle for implementation of a mass screening program in LRCs is the limited resources to support mechanical and technical facilities. From the literature, it was further clear that young age of the target population (Galukande and Kiguli, 2010), low awareness (Bastis, 2010; Mauad et al., 2009) of breast cancer and social barriers (Parsa and Kandiah, 2010; Anderson, 2010) can seriously influence the effectiveness of the screening program.

Several studies addressed potential obstacles for implementation of screening program in LRCs (Caleffi et al., 2010; Mauad et al., 2009; Azaiza et al., 2010; Lin, 2008; Secgil and Nahcivan, 2006; Dinshaw et al., 2007; Dunn et al., 2010; Lamyian et al., 2007; Parsa et al., 2006; Hatefnia et al., 2010; Montazeri et al., 2005). Of 25 papers we reviewed from Group II, more than 80% explicitly discuss barriers and challenges in establishing screening in LRCs Parsa et al. described the most common barriers among Asian women in three categories including lack of knowledge, socio-demographic factors and psychosocial factors (Parsa et al., 2006). In view of social and cultural factors, conservative attitudes on women's bodily experience, stigma, misconceptions and lack of support by family for women diagnosed with breast cancer will prohibit women's screening participation and seeking on-time diagnosis and treatment (Maqsood et al., 2009). Lack of quantitative and qualitative research supporting decision making, program

capacity and community awareness have been mentioned by the BHGI as the biggest challenges of breast cancer control in LRCs (Anderson et al., 2011; Harford et al., 2011; Yip et al., 2011; Cazap et al., 2011; Harfird, 2011). Cost-effectiveness analyses will guide health policy makers to find the optimal screening modality and/or define the target population and frequency of the screening tests which best fits a specific population. This may even be more critical for LRCs where the budget is small and the burden of disease is relatively large but mostly underestimated. Only few studies have assessed cost-effectiveness of the breast cancer screening activities in LRCs (Okonkwo et al., 2008; Groot et al., 2006).

Group III: Knowledge and attitudes on breast cancer and screening behaviour

The majority of studies included in group III, focusing on awareness of breast cancer, indicate that knowledge and attitudes toward breast screening in LRCs are not balanced with the actual screening behaviour (Parsa and Kandiah, 2005; Harirchi et al., 2009; Rizwan and Sadullah, 2009; Nur, 2010; Temitope and Daniel, 2007; Aderounmn et al., 2006; Okobia et al., 2006; Kayode et al., 2005; Balogum and Owoaje, 2005; Simi et al., 2009; Masoumi and Moradi, 2005), see Table 1. Regular performance of screening behaviour such as breast self examination (BSE) varied from less than 10% to 80%, depending on education, occupational and socioeconomic status (Karayurt et al., 2008; Heidarian et al., 2008; Ibrahim and Odusanya, 2009). On average, less than 50% of women who were aware of BSE, did practise it regularly. It was also noted that the examination technique was incorrect among the majority of women who performed BSE. Health care providers, who are usually considered as the main source of information to the community, were not sufficiently aware about breast cancer screening and/ or not motivated enough to encourage women to do screening activities, i.e., in Iran and Nigeria (Harirchi et al., 2009; Akhigbe and Omuemu, 2009). Electronic media, TV, was noted as the most important source of getting information on breast cancer, while health care providers were ranked last (Montazeri et al., 2008;

Hajian et al., 2010). Relatives and friends were the most common sources for getting information among less educated women (Hatefnia et al., 2010). Misconception on breast cancer causes and expectations from screening program were highest among Pakistani women (Gilani et al., 2010). Despite low awareness of breast cancer in LRCs, only a few studies provided and evaluated methods for increasing awareness, e.g., continuing education by health care providers and/or national and local awareness campaigns (Ali and Baig, 2006; Adib et al., 2009; Moshfeghi and Mohammadbeigi, 2010; Keshtgar and Baum, 2010; Noroozi et al., 2010; Tavafian et al., 2009; Dow et al., 2007; Garg et al., 2010). In Table 2, we summarized recently published recommendations and practical considerations offered by BHGI (Anderson et al., 2011; Harford et al., 2011; Yip et al., 2011; Cazap et al., 2011) , particularly recommendations for middle income countries on breast cancer controlling strategies in LRCs. The central focus of the BHGI recommendations lie on the integrated efforts related to public awareness and health servicecapacities for early detection, diagnosis and treatment. BHGI experts suggest that a control strategy in LRCs refers to an organised approach to reduce advance disease and burden of breast cancer. Therefore, accurate incidence, mortality and survival data are necessary to be determined for prioritization, resource allocation and evaluation of controlling plan. Lack of population-based registries in LRCs can be constituted by number of tailor-made methods such as hospital-based records and verbal autopsy. Knowledge on the health services capacities in terms of man manpower and technical equipments and the best use of available resources result in a well-organized program. Implementation science helps policy makers to translate scientific findings at various levels of the population and health care system into practical knowledge to conceive an effective strategy. A controlling plan must consider the stakeholders foundations of government and non-governments organisations (NGOs). In addition, there is need to train researchers and healthcare workers in LRCs. Building capacities within national institutes can prevent health care workforce from immigrating to developed countries. Increased public awareness regarding the disease symptoms and screening behaviours contributes to detection of less advanced stage and strength public participation in controlling efforts. Further, we described the implications of these recommendations for Iran by comparing the current obstacles and opportunities related to each recommendation.

Conclusion

AIn this literature review, we found that the number of studies on breast cancer control in LRCs has increased and became more visible as published in journals indexed by PubMed for example. This could be explained by more national and international attention for the global rise of breast cancer particularly in countries with limited resources.

Strong research evidence indicates that the breast cancer burden is decreasing after implementing mass screening and early detection programs in Western populations,

e.g., the Netherlands and Sweden (Christensen et al., 2006). Most experts believe that this could be used as a basis to build controlling programs in LRCs. However, as early detection is relatively new in LRCs, knowledge about effectiveness, cost-effectiveness and feasibility of screening are greatly limited. There is a need for more quantitative and country-specific evidence- based research in LRCs. As a first step in this direction, the problem and health service capacities (availability and accessibility) should be quantified. These provide fundamental information to determine what changes are needed to make a country-specific plan.

Breast cancer control in LRCs through an integrated approach aimed at down staging will improve disease outcome and decrease disease burden. It pursues through translation of descriptive data (incidence, mortality and survival data) and insight from implementation sciences into practical solutions for a suitable controlling plan. To be effective, LRCs must start with a well-managed and well-organized small plan for a selective group of high-risk women and gradually expand to the entire population (Disease Control Priorities Project, 2011). Once a screening program fits the country's situation, the next step is to ensure that the program will be accepted by the public. Based on the WHO recommendation, compliance rate less than 70% makes the program inefficient (Harford, 2010). This is not only for the starting phase, but also for the following confirmation and treatment phases. Adherence to the programs is strongly associated with the public's motivation and awareness. The low awareness rate in most LRCs is alarming and interventions to raise public awareness are critically needed.

Regarding the implications for Iran, we should stress that due to successful controlling plans of infectious diseases, cancers in general are the leading cause of death and morbidity (Emami-Razavi, 2009). The increase of breast cancer incidence, and hence a more heavy burden of disease in Iran, may be an argument in favour of screening as early detection and treatment will save lives. However, beyond this theoretical rationale, the introduction of a screening program in Iran, with approximately 15 million women aged 40-69, demands caution not only due to the expenses of facilities and relatively young age of the target group, but also due low public awareness of breast cancer in Iran. In spite of the growing attention on breast cancer in Iran and increased funding for research on this issue, descriptive research dominate the literature. Prevention activities and early detection are at the margins in favour of treatment- oriented strategies. Therefore, our ability to give a clear advice for breast cancer screening in Iran is limited.

At present, mammography equipment is available at most cancer centres and in the private sectors. However, limitation in accessibility for the entire population, a younger age of the target population (age 40s and 50s) and a low level of overall incidence of breast cancer in Iran lead to the conclusion that mammography will not be a cost-effective screening method for the entire population (Maqsood et al., 2009). An alternative is to consider a selected group based on risk factor profile. In selecting the most appropriate screening modality,

mammography may outweigh CBE if digital mammography screening is considered instead of screen- film mammography (Perry et al., 2011). Therefore, a combination of these two methods - mammography and CBE - may result in an even higher effectiveness with e.g. implementation of CBE for younger women (<45) and mammography from age 45 onwards. The high prevalence of obesity among the Iranian population demands utmost concern in application of mammography (Esteghamati et al., 2010). Obese women are not eager to participate in screening activities due to physical problems. Less accurate physical examination of obese women and difficulties of taking more views on mammography, which makes it more expensive, makes both methods less accurate (Oestreicher et al., 2002; Elmore et al., 2004).

Because of the above mentioned reasons, it is clear that both objective and the process of the implementation should be tailored to Iran. While health care workforces and equipment for early detection are available, inequitable distribution of the resources and weak collaboration among the departments in the health care system limit the accessibility of the available facilities. Limited quantitative and implementation studies to identify key problematic points in the health system lead to vagueness of health system capacities. Despite the existence of a national cancer council, cancer programming and research institutes are fragmented which result in neglecting research priority and duplicated research activities in a given issue as descriptive research.

Diversity of the Iranian population in terms of cultural, social and religious belief also poses challenges and limit the applicability of a unique plan. However, there are a number of major and minor opportunities which would pave the way towards an appropriate controlling plan. For example, the presence of a national council for cancer prevention in the Ministry of Health monitors and quantifies the breast cancer burden, provides responses and translates research findings into the patients' and public care practices. Governmental efforts for more international collaboration in cancer- related knowledge and technology transfer leading to increased number of health professionals and cancer excellence centres is owed to the efforts of the council. The national cancer registry established in collaboration with the International Agency for Research on Cancer (IARC) is a typical example in this regard (WHO, 2008). Moreover, women education in Iran has been considerably improved over the last 30 years ago from less than 20% to more than 80% of the total female population. This gives more opportunity to increase women's knowledge on breast cancer. This education helps them overcome misconceptions about breast cancer causes and screening behavior. In this way, the social stigma may lessen overtime. Two organized networks, National Literacy Campaign and Health Network System with highly motivated and dedicated workers (called Behvarz), provide opportunities for public education regarding breast cancer in Iranian women, especially for surrounding areas. Due to cultural believes, public education through mass media (such as TV) is limited, while Short Message System (SMS) is a simple and inexpensive way to raise awareness and encourage Iranian women to seek earlier detection (Keshtgar and Baum, 2010).

In summary, screening options for Iran are limited due to resource and demographic constrains. We think Iran should adopt a tailor-made strategy for mass screening with emphasis on reducing in the number of advanced stage tumours or "down-staging". Combination of two approaches, CBE and mammography would be promising given the increased knowledge of health care professional and public awareness. Equally important, a controlling plan should be started small and expanded gradually.

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