Breast Cancer Screening Program in Morocco: Status of implementation, organization and performance

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Breast Cancer Screening Program was introduced and rolled out in Morocco in 2010. Women between 40 and 69 years are screened at the primary health centers (PHC) with clinical breast examination (CBE). A comprehensive evaluation of the program was conducted in 2016–2017 for quality assurance and mid-term course correction. The evaluation process involved: in-depth interviews of program managers; focus group discussions with service-providers of screening, diagnosis and treatment; supportive supervisory visits to randomly selected PHCs and diagnostic centers; desk review of the national guidelines and other published documents; and analysis of the performance data compiled by the program-in-charge. We found that the program has strong political support, a well-organized management structure and documented national policy and protocol. In absence of a mechanism to identify and invite the eligible women individually, the program is opportunistic in nature. Every PHC is provided with an annual target to be screened. A highly visible annual campaign to educate and motivate women has a major impact on participation. Record keeping and data collection are paper-based. In the years 2015 and 2016, 1.1 and 1.5 million women were screened, respectively. In the year 2015, 62.8% of the annual target population was covered, CBE positivity was 3.2%, a further assessment rate of screen-positive women was 34.1% and the breast cancer detection rate was 1.0/1000 women. Systematic paper-based data collection enabled the assessment of some of the process and outcome indicators. The screening coverage was moderate and the cancer detection rate was low.

Introduction

Breast cancer is leading cancer among females in Morocco, with an age-standardized incidence rate of 40.8 per 100,000

person-years and mortality rate of 18.0 per 100,000 person-years in the year 2012.[1] The mean age at diagnosis of 49.5 years is approximately 10 years earlier than that reported in the Western world.[2] The National Breast Cancer Screening Program was introduced and rolled out across all the 12 regions of Morocco in the year 2010, after the implementation and evaluation of a pilot project in Temara province.[3,4] The major stakeholders in program implementation, in addition to the Ministry of Health (MoH) were the Lalla Salma Foundation for Cancer Prevention and Treatment (LSFCPT) and the United Nations Population Fund (UNFPA).

A core group of national and international experts supported by the MoH drafted the screening protocol in the year 2010.[5] The target age for the biennial screening program was 45–69 years initially. The protocol was revised in 2016 to lower the age at screening initiation to 40 years. Trained nurses, midwives and general practitioners perform clinical breast examination (CBE) at the primary health centers (PHC) and refer the screen-positive women to the nearest Cancer Early Detection Center (CEDC) for further assessment. The CEDCs (total 27 across the country) are the diagnostic centers equipped with facilities for surgical consultation, digital mammography, breast ultrasound, core biopsy and fine needle aspiration cytology (FNAC).

What's new?

The rising incidence of breast cancer is a tremendous public health challenge in the developing world. Clinical breast examination is a promising approach provided effective diagnosis, timely treatment, and adequate resources. Here, the authors conducted a comprehensive evaluation of the Breast Cancer Screening Program in Morocco, where systematic data collection is challenging in absence of a computerized information system. They found that the program has strong political support and a well-organized management structure. Systematic paper-based data collection showed a moderate screening coverage and low cancer detection rate. The experience will be useful for all developing countries implementing clinical breast examination.

A comprehensive evaluation of the screening program was conducted in 2017 by the International Agency for Research on Cancer (IARC) in collaboration with the MoH and LSFCPT. The evaluation process critically looked into the program policy, protocol and financing, community mobilization efforts, quality and performance of the screening and the diagnostic services, referral mechanisms, training of service providers and the current practices on program monitoring and coordination. The evaluation methodology, the key observations and the summary of the post-evaluation recommendations are described in this article.

Methods

A program evaluation team was constituted with representatives from the MoH, IARC and LSFCPT. The evaluation process involved (*i*) in-depth interviews of the program managers and the representatives from the major stakeholders, (*ii*) focus group discussions with the service-providers involved in screening, diagnosis and treatment, (*iii*) supportive supervisory visits to randomly selected PHCs and the CEDCs and (*iv*) desk review of the national guidelines, other published technical documents and the annual performance data compiled by the MoH.

In-depth interviews of two key MoH officials, two regional and two provincial program focal points, and one representative each from the LSFCPT and the UNFPA were conducted by three members of the evaluation team to collect information on the program policy, coordination and management, financing, existing quality assurance process, the challenges and barriers in implementation. The officials were interviewed after obtaining their verbal consent and a set of open-ended questions was used as the interview guide.

In addition, four focus group discussions (FGDs) were conducted with the different categories of service-providers (nurses, midwives, general practitioners, surgeons, radiologists and pathologists) involved in the program. A total of 32 participants for the FGDs were selected in consultation with the national focal point of the program to ensure the representativeness from the different regions. A set of open-ended questions was used to guide the discussions. The objectives of the FGDs were to get information on the screening and the diagnostic processes, mechanisms of referral and tracking of the screen-positive women, record keeping, training needs and the challenges encountered by the service providers.

Eight regions implementing the program for more than 1 year were included in the supportive supervision. A single province from each region was randomly selected from the complete list of provinces using the random sample selection command in Stata statistical software (Stata version 13.1, StataCorp LLC, College Station, TX). In each selected province, one urban and one rural screening centers were selected randomly using the same method. The evaluation team visited a total of 14 screening centers (PHCs) in eight provinces. The selected province in the Casablanca-Settat region did not have any rural PHC and the selected province in the Drâa Tafilalet region did not have any urban PHC running the program for more than 1 year. The process of client counseling and registration, the CBE procedure, the referral practices and the systems of record keeping and report generation were observed at each PHC using a facility supervision checklist. The number of women screened and the number referred with positive CBE results during 2016 were abstracted from the registers maintained at the PHCs. The supervisory team visited the CEDCs in each randomly selected province, except Midelt and Al Haouz provinces where the CEDCs were not yet functional and the screen-positive women were being referred to the provincial hospital or to the CEDCs of the adjacent provinces. At each CEDC the supervisory team reviewed the process of client registration, further assessment protocol, availability of diagnostic services, number of procedures performed (mammography, ultrasound and core biopsies) and number of breast cancers detected during 2016, using a checklist.

The MoH shared with the team the aggregated performance data (number of women screened for the first time in the round, number positive on CBE, number of CBE positive women undergoing diagnostic procedures at the CEDCs and number of breast cancers detected) collected from all the screening centers and the CEDCs for the years 2015 and 2016. The Ministry has multiple "check" mechanisms to ensure the authenticity and validity of the data collected from the different health facilities. The report generated from each health facility is checked and certified by the facility in charge. The provincial focal point verifies the data by reviewing the registers maintained at each facility at

random. The supportive supervisory team cross-checked the periodic reports submitted by the screening and the diagnostic centers with the registers. The data were analyzed to estimate the screening coverage, CBE-positivity, proportion of CBE-positive women undergoing mammography and breast cancer detection rate. Rather than presenting the results of the in-depth interviews, the FGDs, supportive supervision and performance data analysis separately, we present, in this article, a summary of the comprehensive report generated from the different activities.

Results

A Core Technical Committee of the MoH is responsible for implementing and monitoring the nationally coordinated program. The program has an officially documented policy to provide breast cancer screening to all the eligible women and a dedicated budget initially planned over 10 years (2010–2019).[5] The screening and the diagnostic tests are provided free of charge to the women participating in the program. Cancer treatment is not free of charge, though a large majority of the population is covered by mandatory health insurance plan or the special assistance schemes such as the Medical Assistance Regime for the economically disadvantaged.[4]

Currently, there is no mechanism to identify and invite the eligible women individually. Hence the program is not population-based. The national program coordinator sets an annual target (number of women to be screened for breast cancer for the first time in the biennial round) for each province, based on which every provincial focal point allocates an

annual target to every PHC within his/her jurisdiction. The target is usually set between 30% and 50% of the estimated number of age-eligible women residing in the PHC area. Lower targets are fixed for the PHCs initiating screening services recently or having fewer providers.

Every year, a nationwide breast cancer awareness campaign is conducted in the month of October through posters, billboards, mass media (print media, radio and television spots, sponsored events etc.) and social media. The civil society organizations are also involved in such a campaign and they organize road shows, group meetings and other educational activities during this period. The campaign has a huge impact on the participation in the screening program. It was observed that 51.6–87.4% of the total women screened in the year 2016 at the different PHCs were registered during the post-campaign months (November and December; Figure 1). Women in the target age attending the PHCs for medical consultations, either for themselves or their relatives and friends, are invited by the PHC staff to undergo screening.

The number of women screened at the PHCs visited during the supportive supervision ranged between 332 and 2108 in the year 2016. The PHCs do not have computerized information system. The records of the women undergoing CBE are maintained in a paper-based screening register designed and supplied by the program. If breast checkup is performed on a woman who is either beyond the eligible age or already has been screened in the round, her records are not entered in the screening register. The registers were observed to be up to date, complete and well maintained in the majority of the
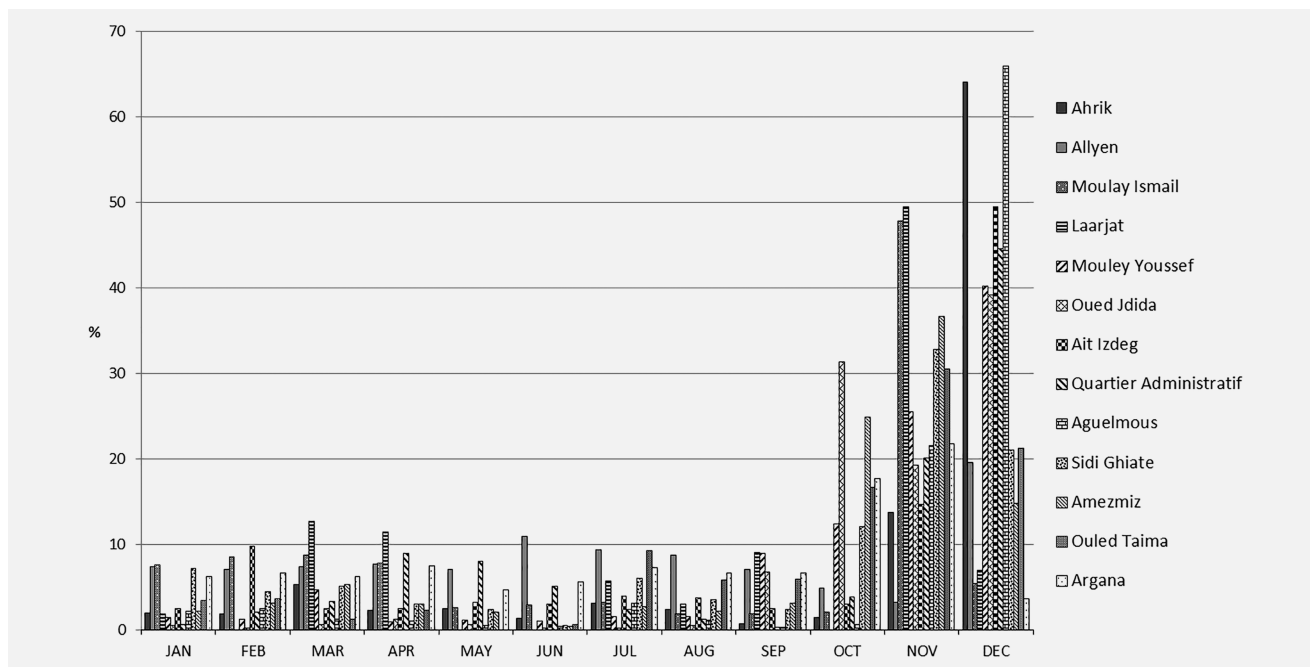

Figure 1. Proportion of women screened for breast cancer by month in 2016 at the PHCs included in the supervisory visits (a significant increase was observed during November and December—the campaign months) Source: Ref. 6

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centers visited. In absence of a computerized information management system, the tracking of the screen-positive women was entirely manual and inefficient.

The program has a written protocol for data collection and program monitoring. Each PHC submits a monthly performance report to the provincial focal point, which includes the number of women screened and the contact details of the screen-positive women. The provincial focal points are responsible for crosschecking the list of the screen-positive women received from the PHCs with the list of the screen-positive women undergoing further assessments at the CEDCs and at the provincial hospitals. The provincial focal points submit the performance reports from the PHCs and CEDCs to the regional focal points. The aggregated data from the regions are submitted to the program officer-in-charge at the MoH.

The number of women screened for breast cancer nationwide in the years 2015 and 2016 were 1.1 and 1.6 million, respectively. The follow-up information from the provinces for the year 2016 was incomplete during the program evaluation in 2017. Since the data for the year 2015 were reasonably complete, we present the screening performance for that year in details. The screening performance data for 2015 were available from all the regions except the Oued Ed-Dahab-Lagouira region having a small eligible population (N = 11,000).

The annual targets fixed for the year 2015 in the different regions ranged between 25% and 60%; 11 regions (out of total 15) could achieve at least 75% of the target (Table 1). Overall 31.4% of the total eligible population (equivalent to 62.8% of the annual population eligible for the biennial screening) was screened nationwide in 2015.

The overall CBE positivity was 3.2% and ranged from 1.3% to 6.0% across the regions (Table 2). At the CEDC a trained gynecologist re-examined every CBE-positive woman and advised diagnostic mammography only if any abnormality was suspected on repeat examination. Breast ultrasound is often used as an adjunct to mammography as the facility is available in all the CEDCs. The radiologist may specifically request the ultrasound report if the interpretation of mammography is difficult due to the high density of the breast tissue (Figure 2). Approximately one-third (34.7%) of the total CBE-positive women underwent mammography at the CEDCs, though the rate varied between 10.5% and 64.9% across the regions (Table 2). The reasons for the rest of the women not undergoing mammography could be nonreferral by the gynecologists after a repeat physical examination or noncompliance of the CBE-positive women to further investigations through the program. The current system of data collection did not allow us to estimate the noncompliance rate separately. Core biopsies were performed on 14.4% of women

Table 1. Breast Cancer Screening in Morocco: Screening coverage by total eligible population and by annual target population in different regions in 2015

Region	Total No. of eligible women (age 45–69 years)[2]	Annual target for breast cancer screening (age 45–69 years)[3]	Annual target population as % of total eligible	No. of women screened (age 45–69 years)	% of annual target population screened	% of total eligible population screened
Tangier-Tétouan	329,864	98,958	30.0%	107,849	109.0%	32.7%
Oriental	229,513	70,313	30.6%	59,409	84.5%	25.9%
Fès-Boulemane	200,298	100,150	50.0%	91,011	90.9%	45.4%
Meknès-Tafilalet	245,049	91,860	37.5%	61,629	67.1%	25.1%
Rabat-Salé-Zemmour-Zaer	311,090	111,044	35.7%	75,733	68.2%	24.3%
Oued Ed-Dahab-Lagouira[1]	11,283	–	–	–	–	–
Grand Casablanca	451,350	186,326	41.3%	163,461	87.7%	36.2%
Marrakech-Tensift-El Haouz	348,880	139,552	40.0%	134,315	96.2%	38.5%
Laâyoune-Boujdour-Sakia El Hamra	15,444	9453	61.2%	8431	89.2%	54.6%
Guelmim-Es Semara	42,305	12,802	30.3%	15,391	120.2%	36.4%
Souss-Massa-Drâa	371,121	111,337	30.0%	119,172	107.0%	32.1%
Gharb-Chrarda-Béni Hssen	190,880	82,802	43.4%	48,169	58.2%	25.2%
Chaouia-Ouardigha	185,165	47,627	25.7%	35,741	75.0%	19.3%
Doukkala-Abda	214,571	86,787	40.4%	71,422	82.3%	33.3%
Tadla-Azilal	156,236	52,533	33.6%	70,080	133.4%	44.9%
Taza-Al Hoceima-Taounate	179,923	60,377	33.6%	31,725	52.5%	17.6%
Total national	3,482,972	1,261,921	36.2%	1,093,538	86.6%	31.4%

[1]Data were not delivered to the Ministry of Health.
[2]The population relative to the year 2015 was estimated on the basis of the preliminary results of the last general census of the Population and the Habitat carried out in 2014.
[3]Decided by program focal point.
In the year 2015, there were total 16 regions in the country, which was subsequently reduced to 12 through administrative reorganization.
Source: Ref. 6; Population source: MoH

Table 2. Breast cancer screening in Morocco: information on the further assessment of the CBE positive women in different regions in 2015

Region	No. of women screened (age 45–69 years)	No. (%) of women positive on CBE	Breast cancer early detection activities at the CEDCs			
			No. (%) of CBE positive women undergoing mammograms	No. (%) of CBE positive women undergoing FNAC/core biopsies	No. of breast cancers detected[3]	Breast cancer detection rates (/1000)
Tangier-Tétouan	107,849	6443 (6.0)	1692 (26.3)	152 (2.3)	193	1.8
Oriental	59,409	2500 (4.2)	813 (32.5)	53 (2.1)	26	0.4
Fès-Boulemane	91,011	4281 (4.7)	1228 (28.7)	105 (2.4)	50	0.5
Meknès-Tafilalet	61,629	1791 (2.9)	680 (38.0)	191 (10.7)	87	1.4
Rabat-Salé-Zemmour-Zaer	75,733	4228 (5.6)	1961 (46.4)	562 (13.3)	175	2.3
Oued Ed-Dahab-Lagouira[1]	–	–	–	–	–	–
Grand Casablanca	163,461	2160 (1.3)	1402 (64.9)	258 (11.9)	214	1.3
Marrakech-Tensift-El Haouz	134,315	3540 (2.6)	1115 (31.5)	118 (3.3)	93	0.7
Laâyoune-Boujdour-Sakia El Hamra[2]	8431	202 (2.4)	–	–	–	–
Guelmim-Es Semara	15,391	654 (4.2)	173 (26.4)	7 (1.1)	3	0.2
Souss-Massa-Drâa	119,172	2525 (2.1)	753 (29.8)	73 (2.9)	69	0.6
Gharb-Chrarda-Béni Hssen	48,169	2155 (4.5)	494 (22.9)	122 (5.7)	88	1.8
Chaouia-Ouardigha	35,741	1342 (3.7)	775 (57.7)	7 (0.5)	6	0.2
Doukkala-Abda	71,422	2687 (3.8)	286 (10.6)	37 (1.4)	21	0.3
Tadla-Azilal	70,080	1398 (2.0)	612 (43.8)	21 (1.5)	18	0.3
Taza-Al Hoceima-Taounate	31,725	866 (2.7)	91 (10.5)	34 (3.9)	5	0.2
Total national	1,093,538	34,828 (3.2)	12,075 (34.7)	1740 (5.0)	1048	1.0

[1]Data were not delivered to the Ministry of Health.
[2]Mammogram is not available in this region, positive CBE was referred to the nearest region.
[3]All breast cancer detected included those whose FNAC/core biopsies were done in the private sector.
Source: Ref. 6

undergoing mammography (range 0.9–37.4%). Total 1048 breast cancers were detected among the CBE-positive women attending the CEDCs for the diagnostic tests. The breast cancer detection rate in the screening program was 1.0 per 1000 women screened in the year 2015. The detection rates varied between 0.2/1000 and 2.3/1000 across the different regions (Table 2). The positive predictive value (PPV) of the clinician's referral to mammography was 8.7% (1048/12075) to detect breast cancers.

According to the latest report available with the Ministry, total 1.6 million women (age between 40 and 60 years) were screened in the year 2016, achieving a population coverage of 32.8%; 84,671 (5.2%) were CBE-positive and a total of 1238 breast cancers were detected (detection rate 0.8/1000) among the women evaluated at the CEDCs till the time of compilation of the report.

During the supervisory visits to the randomly selected CEDCs (N = 6) it was observed that the number of CBE-positive women undergoing mammography ranged between 225 and 3507 in the year 2016. The reports of mammography as well as the histopathology/FNAC for the year were available at all except one CEDC. Out of the total 4910 diagnostic mammographies performed at the five CEDCs in the year 2016, 356 (7.2%) had BI-RAD (breast imaging, reporting and data systems) score of 4+ and a total of 254 breast cancers were detected among them. The PPV of diagnostic mammography to detect breast cancers at the threshold of BI-RAD 4 was 71.3% (254/356).

The training of the service providers [general practitioners (GPs), nurses and midwives] on CBE is conducted over 4 days at the regional headquarters. However, the practical training is not very structured and no certificate is issued to the participants after the training completion. At the FGDs, the service providers expressed the need for periodic refresher training. Some of the nurses and midwives were observed during the supervisory visits to be performing CBE without any formal training through the program. They were trained by the GPs working at the PHCs.

Discussion

The increasing incidence of breast cancer in the low- and middle-income countries (LMICs) has been ascribed to the increasing life expectancy, adoption of western lifestyles, changing reproductive practices and improved diagnostic facilities.[7,8] The relatively younger age at diagnosis (23% of the newly diagnosed breast cancers are in women below 50 years of age against 10% in high-income countries), higher prevalence of triple-negative disease, late-stage at detection due to poor access to care make breast cancer a formidable public health challenge in the developing world requiring urgent attention.[9–11] Many experts share the view that CBE does have a role in breast cancer screening in the low
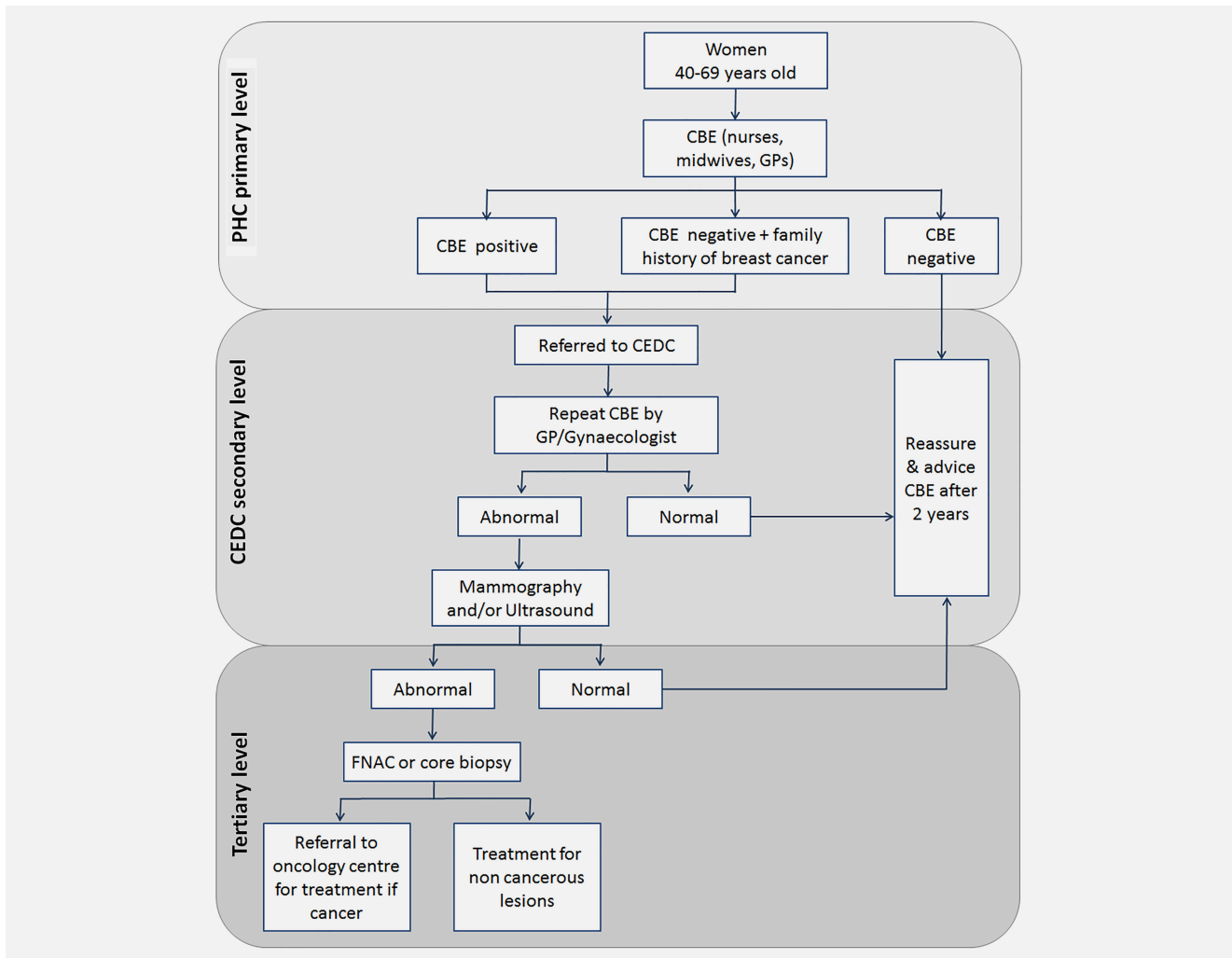
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Figure 2. Algorithm for breast cancer screening in the national breast cancer early detection program of Morocco

resourced settings.[12–14] According to WHO, CBE is a promising approach for low resource settings if effective diagnosis and timely treatment are available and adequate resources are available to sustain the program and maintain quality.[15]

CBE has several logistic advantages in the context of the LMICs (feasible, less resource-intensive, point-of-care in nature and low training needs) and its efficacy to achieve significant downstaging has been demonstrated in at least three randomized controlled trials.[8,16–18] The cost-effectiveness of annual CBE screening in 40–60 years old women has also been demonstrated in simulation modeling studies in low resourced countries.[19] Morocco, like some other limited resourced countries (Bangladesh, China, India, Ghana, Colombia etc.) with growing breast cancer burden, decided to implement CBE-based screening through routine health services, in view of the fact that mammography screening is too complex, resource-intensive and not feasible to implement and unaffordable.

The evaluation of the National Breast Cancer Screening Program in Morocco demonstrates the real-world perspective on CBE practice in the diverse healthcare settings. The evaluation process comprised of an analysis of aggregate data manually collected from all the screening and the diagnostic centers supplemented by supportive supervisory visits to at least a few representative health facilities. This approach is feasible in many developing countries that have introduced cancer screening programs but do not have a well-functioning health information system. The Moroccan experience also highlights that effective program leadership, a written standard operating procedure of data collection for program monitoring, appropriate coordination between different service delivery settings, meticulous maintenance of paper-based records and orientation of the service-providers to the importance of proper record-keeping can help collect performance data even in absence of a computerized information system from a mass-scale screening program in a developing country. However,

data collection solely is not enough to ensure improvement in the quality of the program. The performance of the program in terms of inputs and outcomes should be monitored and evaluated and specific actions need to be taken to fill in the gaps identified during the evaluation.

The screening program evaluation is based on a set of performance indicators along with their pre-defined standards. The national breast cancer screening guidelines of Morocco enlisted only two process indicators and their desirable standards—the screening coverage of the annualized target population (acceptable standard 60%) and the CBE positivity (acceptable standard 10–13%). The program achieved the acceptable annual screening coverage of 60%, both in 2015 and 2016. The average CBE positivity was 3.2% in the year 2015 and increased to 5.2% in 2016 essentially due to the lowering of the target age to 40 years. However, both the values were substantially lower than the acceptable standards (10–13%) mentioned in the protocol. An earlier evaluation of the Moroccan program (2012–2014) also reported a screen positivity of 3.3% (range 2.1–4.5%).[20] The national standard was determined based on the CBE positivity of 9.3% observed in the pilot study conducted among 2350 women in Temara region.[3] CBE being a subjective test, the positivity is often high when the newly trained providers initiate screening. This is most likely the explanation for the high CBE positivity observed in the pilot study. Taking cognizance of the consistent and robust data obtained from the program over several years, the national experts need to review the standards. CBE positivity should be regularly monitored across the PHCs and either too high or low values would necessitate retraining of the service providers.

The detection rate for breast cancer is an important outcome indicator that we could estimate for the Moroccan program. The detection rate depends on a number of factors, for example, disease prevalence, screening target age group and coverage, sensitivity of the screening tests, efficiency of the diagnostic workup, compliance of screen-positive individuals to further assessment, etc. A low detection rate should always alert the program managers to review the quality of screening and diagnostic tests and also the compliance of the screen-positive women to further evaluation. The detection rate of breast cancer (1.0/1000 women screened) in the screening program of Morocco was much lower than the detection rates reported from the mammography-based screening programs in Europe (5.9/1000 women screened) or CBE-based screening in USA (5.0/1000 women screened); a phenomenon that can partially be explained by the difference in the disease prevalence.[21,22] The detection rate in Morocco was comparable to that reported in a large breast cancer screening study using annual CBE among 896,596 women between 40 and 69 years of age in Taiwan.[23] The detection rate in the Taiwanese program was 1.0/1000 screened women, significantly lower than mammography screening of the same population (4.9/1000), thus highlighting the inherently lower sensitivity of CBE. It is possible that the opportunistic program is screening a proportionately higher number of younger women and the elderly women with much higher risk of breast cancer are being left out. The detection rate of breast cancer in Morocco could also be influenced by the noncompliance of the CBE-positive women to further assessment, which was not possible to measure. The access to the diagnostic procedures remains quite variable in the country, and particularly low in the geographically difficult areas. It is possible that some of the CBE positive women underwent diagnostic evaluations in the private sector and the program did not have access to the data. The low detection rate of breast cancer in the program is likely to reduce the cost-effectiveness of breast cancer screening significantly. It is important to perform a formal cost-effectiveness analysis of the program by carefully estimating the direct as well as the opportunity costs.

Morocco has made significant efforts to ensure access to breast cancer screening and diagnostic services to the population, even though there are major pitfalls in the program. The program is opportunistic in absence of a mechanism to individually identify the eligible women and invite them. It is well-established that an opportunistic screening program is not only inefficient but also promotes inequity by leaving the socially and economically disadvantaged women out of the program. The PHCs may be entrusted to invite the population from the list of beneficiaries maintained at the PHCs. In some countries, the community health workers have been successfully engaged to mobilize the individuals eligible for screening.[24] The variability in the CBE positivity and the detection rates of breast cancer across the different regions in Morocco highlight the requirement of further training and retraining the providers. Some of the PHCs screen very few women per month and it is difficult to maintain the skills of the providers. A structured training plan should be introduced to ensure that there are adequately trained and certified providers and each provider attends one refresher-training course per year. The alteration in the target population to include the younger women may further reduce the PPV of the screening test and the detection rate of breast cancer, which effectually can reduce the efficiency of the program and increase the cost. The extension of the screening to the younger age should be reviewed by assessing the detection rates stratified by the age groups. The program needs to collect the age of the screen-detected cancers to perform such analysis.

The MoH has set up upgraded facilities for breast cancer management at the oncology centers at Rabat and Casablanca and has established tertiary care cancer centers in the majority of the regions.[4] The program does not have any linkage with the oncology centers and as a result, it is not feasible to track the screen-detected women or to assess the impact of the program in achieving downstaging of breast cancer or improved survival. Setting up computerized information systems at the CEDCs (CEDCs have more resources and better internet access compared to PHCs) and linking them at least with the

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major oncology centers and ensuring that the oncology centers share the breast cancer data with the program on regular basis can minimize these gaps.

The evaluation team suggested a set of recommendations to improve the quality of the program. These recommendations included ensuring adherence to the screening and further assessment protocols by all the service providers, strengthening the community mobilization activities around the year, introducing computerized database at the CEDCs, greater stress on the hands-on practical training and periodic re-orientation of the providers, more structured evaluation of the screening as well as the diagnostic activities on yearly basis etc. The team also recommended that the program should collect data from the major oncology centers and the population-based cancer registries to document the proportion of breast cancers being detected through the program and to document the stage shift achieved through screening. A prospective collaborative study has been initiated by IARC and LSFCPT to compare the stage distribution, quality of life and survival between the screen-detected and the non-screen-detected breast cancer patients at the major oncology centers in Morocco. Our study will provide valuable information on the benefit of the screening program. The MoH has already taken necessary steps to introduce the computerized database at the CEDCs and review the training plan, thus completing the dynamic process of program monitoring leading to quality improvement.

Author Contributions
PB contributed to the design and implementation of the study, analysis and interpretation of data and was involved in drafting the manuscript. FS contributed to the design and implementation of the study, interpretation of data and was involved in drafting and revising the manuscript. LB contributed to the conception and design of data and drafting the manuscript. CS contributed to the design and implementation of the study and was involved in drafting and revising the paper. LA contributed to the conception and design of data and drafting the manuscript. EL and RM contributed to the analysis and interpretation of data and was involved in revising the manuscript. RS contributed to the conception of data and was involved in revising the manuscript. YCK contributed to the design of data and was involved in drafting the manuscript. All authors reviewed and approved the final version to be published.

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