

Research in action: mammography utilization following breast cancer awareness campaigns in Lebanon 2002–05

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استخدام تصوير الثدي الشعاعي عقب حملات التوعية حول سرطان الثدي في لبنان 2002 – 2005: بحث ميداني
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الخلاصة: أجريت في لبنان أربعة مسوحات متعاقبة شمل كل منها 1200 امرأة في سياق الحملات الوطنية للتوعية حول سرطان الثدي في الأعوام 2002 إلى 2005، وذلك لقياس معدل انتشار استخدام التصوير الشعاعي للثدي وللتعرف على أثر هذه الحملات، ولإلقاء الضوء على الاختلافات الديموغرافية والإقليمية. وقد كان استخدام تصوير الثدي منخفضاً في الشهور الإثني عشرة السابقة ثم ازداد زيادة طفيفة فقط على مدى السنوات الأربع (من 11٪ إلى 18٪). وفي حملة عام 2005 أصبح في بيروت الكبرى (25٪) وهو ضعفاً ما هو عليه في المناطق الريفية، كما وصل لدى النساء اللواتي تتراوح أعمارهن بين 40 و49 عاماً إلى 21٪ بالمقارنة مع النساء اللواتي هن أصغر سناً (12٪) أو أكبر سناً (11٪). وفي كل موجة يصبح تكرار التصوير الشعاعي للثدي أقل شيوعاً مما كان عليه في التحري للمرة الأولى.

ABSTRACT Four consecutive annual surveys of 1200 women each were conducted in Lebanon in connection with the National Breast Cancer Awareness campaigns (2002–05) to measure the prevalence of mammography utilization and the impact of these campaigns, and to highlight regional and demographic differences. The utilization of mammography in the previous 12 months was low and increased only slightly over 4 years (from 11% to 18%). In the 2005 campaign, it was twice as high (25%) in greater Beirut than in mostly rural areas, and among women aged 40–49 years (about 21%) compared with younger (12%) or older (11%) women. In each wave, repeat mammograms were less common than first time screening.

Utilisation de la mammographie suite aux campagnes d'information sur le cancer du sein au Liban en 2002–2005 : la recherche en marche

RÉSUMÉ Quatre enquêtes annuelles consécutives ont été réalisées auprès de 1 200 femmes chacune, au Liban, dans le cadre des campagnes nationales d'information sur le cancer du sein (2002–2005) afin de mesurer la prévalence de l'utilisation de la mammographie et l'impact de ces campagnes, et de mettre en lumière les différences régionales et démographiques. L'utilisation de la mammographie au cours des 12 mois précédents était faible et n'a augmenté que légèrement pendant les quatre années (de 11 % à 18 %). Pendant la campagne de 2005, elle était deux fois plus élevée (25 %) dans l'agglomération de Beyrouth que dans les zones à dominante rurale, et chez les femmes âgées de 40 à 49 ans (environ 21 %) que chez les femmes plus jeunes (12 %) ou plus âgées (11 %). À chaque vague de campagne, les mammographies de contrôle étaient moins fréquentes que les premières mammographies de dépistage.

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Received: 03/01/08; accepted: 27/03/08.

Introduction

Breast cancer is the most common non-skin malignancy among women in Lebanon, as it is in the whole world. For the past 50 years, it has topped the list of cancers among women [1–3]. About 1 in every 4 cancers in Lebanon is breast cancer: age-adjusted incidence is currently estimated at 76 new cases per 100 000 [4]. Because of concern about the importance of improving prognosis by diagnosing breast cancer in earlier stages, many community campaigns have emerged throughout the world with the aim of increasing uptake of screening by mammography. National levels of mammography utilization for breast cancer screening in the Lebanese population are unavailable.

In 2002, the Ministry of Public Health (MOPH) in Lebanon started organizing annual breast cancer awareness campaigns around the time of the International Breast Cancer Month in October. MOPH has involved the private sector and various health and academic centres in planning, implementing and evaluating these awareness campaigns, which rely heavily on the media. The 2003–05 campaigns included a component to assess their impact. In this study, data obtained from these cross-sectional surveys are analysed and discussed. These are the 1st multi-regional findings on breast cancer screening ever published in Lebanon. They mark a turning point in public health in the recent years to tackle the issue of cancer prevention seriously and openly, and to evaluate all public health interventions to optimize their effects.

The main objectives of this action research were: to measure the prevalence of mammography utilization among women in Lebanon; to assess the impact of campaigns in prompting women to obtain a mammography; and to highlight regional and demographic differences requiring specific approaches in future campaigns.

Background to the study: the campaigns

The central message of the breast cancer awareness campaigns was the promotion of annual mammography screenings among asymptomatic women aged 40 years or older in order to detect incident cancers at the earliest possible stage and thus to improve the prognosis. All public communications stressed that for breast cancer detected early there was a greater than 90% chance of full recovery.

Screening mammographies are rarely reimbursed by third-party payers in Lebanon, forcing physicians to declare the test for diagnostic purposes. In order to facilitate women in obtaining a mammography, MOPH negotiated a discount price of 40 000 Lebanese pounds (about US\$ 27) or less during the campaign month with about 160 centres: hospitals, primary care centres and private laboratories. Participating centres were listed by region on pamphlets widely distributed in locations such as pharmacies, waiting rooms, salons and supermarkets. These pamphlets also included frequently asked questions and answers on breast cancer risk factors, signs, detection and prognosis.

An educational compact disk with a standard presentation was also prepared which health care providers could use for lectures and presentations in community centres and social clubs. The campaigns also included street signs, billboards and pink ribbons, television and radio advertisements and television talk shows. Starting with the 2005 campaign, cell-phone companies sent out brief advertisements free-of-charge via messages to mobile telephones, and campaign banners were included on the homepages of the major Lebanese Internet service providers. The 2006 campaign could not be implemented as a result of the Israel–Lebanon war during the summer of 2006.

The 2003–05 campaigns included impact assessment components. In September 2003 a pre-campaign survey (S1) was conducted in 5 mostly rural areas outside greater Beirut, which included the city of Beirut and its suburbs, to assess any possible long-term effect from the October 2002 campaign. A post-2003 campaign survey was conducted in the same areas in January 2004 (S2). Two other surveys were conducted in January 2005 and 2006 (S3 and S4) to evaluate the previous year's campaigns. Since the activities of the campaigns were inevitably highly concentrated in the greater Beirut area, organizers were initially most interested in assessing the impact in relatively distant regions. Consequently, the 2002 and 2003 surveys did not include samples from greater Beirut. Later, data from the greater Beirut area were deemed equally important, if only for comparison. Thus the 2004 and 2005 surveys added samples of women from Beirut city and suburbs to those from 5 other rural districts.

Methods

Study design and target population

Cross-sectional sample surveys were conducted between 2003 and 2005 targeting adult women selected in small towns and villages in 5 mostly rural districts (*cazas*) in Lebanon. These rural *cazas* were selected for their particular sociocultural characteristics: Akkar and Batroun in north Lebanon, Chouf in the central Mount Lebanon area, Sour (Tyre) in south Lebanon and Zahleh in the eastern inner Bekaa valley.

Sampling procedures

The selection of participants was performed using a cluster sampling technique. Blocks were randomly selected from detailed maps, and buildings selected from within those

blocks. Interviewers then went to those buildings ("cluster units") and canvassed women door-to-door. Questionnaires were completed with consenting women who fitted the inclusion criteria: age 40+ years (in surveys S1 and S2) or age 35+ years (in surveys S3–S5) and residing permanently in the area for more than 1 year.

Selected clusters were canvassed consecutively until the target number of respondents was obtained. These procedures were systematically applied in all waves, and in all locations, including Beirut and suburbs after 2004.

Instruments

A structured questionnaire was developed and tested. It included several sociodemographic questions in addition to questions regarding women's perceptions about breast cancer, the advantages of and obstacles to obtaining a mammography, and reactions to various components of the campaign. A preliminary survey using this questionnaire was conducted for survey S1, prior to the campaign of 2003, among 1200 women selected in the same areas and in the same manner described above. Experience acquired in that preliminary survey was used as a pilot test to improve the flow and clarity of the questionnaire.

At the time of the visit, the aim of the survey was explained to the eligible woman, and her free verbal consent to participate was obtained. When a woman refused to participate, interviewers moved on to her neighbours in the next household within the same cluster unit. The questionnaire was completed in a face-to-face interview conducted with the woman at home, in the mornings and afternoons. Slight changes were introduced in later waves in light of experience acquired in the field and evolving action research questions.

Statistical analysis

In this descriptive analysis, all categorical variables were tabulated as frequencies and percentages and continuous variables as means, standard deviations (SD) and ranges. Prevalence rates were presented with their 95% confidence intervals (CI) :

The total prevalence was not weighted in proportion to the regional components, to avoid the impression that this may be a “national” prevalence figure. Indeed, this could have been possible had the sampling extended to the entire national territory. However, for the purpose of this action research evaluation analysis, an expert-determined sampling of specific areas was judged sufficient. Nevertheless, in view of the large proportion of the population which actually lives in the sampled areas, it is very likely that total prevalence rates found here are good estimates of the national figure. On the other hand, the validity of findings within each region is much more solid, as sampling within areas was conducted using a strict cluster random technique.

Comparisons of specific outcomes such as mammography utilization were performed by region and age group. These were tested using the Student *t*-test and its derivatives, chi-squared, Fisher exact test or *z*-test, depending on the situation. Comparisons with *P*-value ≤ 0.05 were considered statistically significant. All analyses were conducted using *SPSS-PC*, complemented when needed by the Stat-Calc function of *Epi-Info*, version 6.

Results

Sociodemographic characteristics

The first 2 surveys were conducted with 1200 women drawn from 5 rural areas not contiguous with greater Beirut. Starting with S3, the same total sample was selected

from those districts as well as from Beirut city and suburbs. In S1, the mean age of the group was 50 (SD 11) years, range 40–87 years (Table 1). The mean age at menarche was 13.1 (SD 1.5) years. The mean age at marriage was 20 (SD 5) years, range 9–49 years. The mean number of children was 4.1 (SD 2.8), range 0–22. The mean crowding index, an indicator of socioeconomic status (SES) [5], was 1.9 (SD 1.4) persons/room in the family household, range 0.17–13. A level of crowding of 1 person/room is generally considered as indicating middle class SES; higher levels are associated with lower SES. The skewed distribution of the crowding index prompted us to consider using the median instead of the mean in all later considerations of this variable. When medians are considered, the selected groups at each wave and in each region tended towards the middle-class level of 1 person/room. Of surveyed women, only 20% had employment outside the home.

The 1200 women participating in the second survey (S2) did not differ on most sociodemographic variables from those surveyed in S1. The proportion of working women rose to 26%, which may have improved the median crowding index, which fell to 1.2, indicating better SES. The mean age of participants, age at menarche, age at first marriage and number of children did not vary in a significant way in any subsequent wave. The inclusion of women from greater Beirut resulted in an increase in the proportion of working women, with a concomitant lowering of the crowding index.

Mammography utilization

The proportion of women who had obtained a mammography in the previous 12 months varied between areas, and between years (Table 2). Few consistent trends were

Table 1 Personal characteristics of women in 4 consecutive surveys (2003–06)

Area/survey	Age (years)		Age at menarche (years)		Age at first marriage (years)		No. of children		Crowding index (no. of persons/room)		Ever worked outside the house	
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	No.	Median ^a	No.	%
<i>Akkar</i>												
S1	200	51.0 (12.0)	193	12.8 (1.3)	192	19.0 (4.6)	197	5.0 (2.8)	196	2.0	39	20.0
S2	200	51.3 (11.0)	198	13.3 (1.4)	180	19.2 (3.9)	179	4.9 (2.7)	199	1.4	62	31.5
S3	160	47.0 (11.5)	160	13.0 (1.7)	132	20.5 (4.5)	132	4.4 (2.6)	160	1.3	53	33.1
S4	160	46.3 (12.0)	160	13.3 (1.7)	140	20.3 (4.9)	140	5.0 (3.4)	156	0.9	31	19.4
<i>Batroun</i>												
S1	200	49.5 (10.4)	199	12.9 (1.6)	173	21.0 (5.3)	179	3.4 (2.0)	193	1.2	59	32.0
S2	200	52.2 (12.0)	199	13.1 (1.9)	184	21.1 (5.0)	181	3.7 (1.8)	197	1.2	79	39.5
S3	160	50.6 (12.2)	160	13.4 (1.7)	142	22.4 (5.0)	142	3.5 (2.2)	160	1.0	84	52.5
S4	160	52.2 (11.6)	159	13.2 (1.7)	136	22.1 (5.2)	136	3.8 (1.9)	159	1.0	51	32.1
<i>Chouf</i>												
S1	199	53.2 (11.8)	200	13.3 (1.5)	179	20.4 (4.8)	197	3.2 (2.2)	199	2.0	43	21.5
S2	200	51.5 (11.0)	199	13.2 (1.4)	184	20.7 (4.6)	188	3.8 (2.3)	200	1.0	64	32.2
S3	160	48.9 (12.4)	158	13.4 (1.5)	143	20.6 (5.0)	143	3.5 (2.1)	160	1.0	72	45.0
S4	160	50.0 (11.4)	159	13.0 (1.3)	133	20.5 (5.3)	133	3.7 (2.6)	160	1.0	56	35.2
<i>Zahleh</i>												
S1	398	48.4 (10.4)	384	13.5 (1.5)	354	19.3 (4.5)	383	4.7 (3.2)	390	1.5	43	11.1
S2	399	48.9 (9.7)	396	13.4 (1.5)	370	19.9 (6.4)	367	4.7 (2.7)	398	1.2	56	14.2
S3	160	44.9 (9.9)	159	12.6 (1.1)	129	19.5 (3.7)	129	3.8 (2.0)	160	1.0	40	25.0
S4	160	50.0 (11.2)	160	13.0 (1.3)	132	20.4 (4.5)	132	4.2 (2.4)	157	1.0	35	22.0
<i>Sour</i>												
S1	200	50.0 (10.0)	199	12.9 (1.5)	16	20.8 (5.7)	185	3.6 (2.6)	192	1.0	51	26.0
S2	200	50.1 (10.2)	196	13.3 (1.6)	189	19.8 (5.4)	190	4.9 (3.0)	200	1.2	55	27.5
S3	160	45.4 (10.0)	160	13.2 (1.3)	144	19.7 (5.2)	144	4.7 (2.4)	160	1.2	38	23.8
S4	160	51.0 (11.2)	160	13.0 (1.3)	146	18.9 (4.4)	146	5.1 (2.6)	150	0.8	34	21.4

Table 1 Personal characteristics of women in 4 consecutive surveys (2002–06) (concluded)

Area/survey	Age (years)		Age at menarche (years)		Age at first marriage (years)		No. of children		Crowding index (no. of persons/room)		Ever worked outside the house	
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Median ^a	No.	%
<i>Administrative</i>												
<i>Beirut</i>												
S1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S3	200	51.9 (12.0)	198	12.7 (1.6)	177	21.2 (5.2)	177	3.5 (2.1)	200	1.0	79	39.5
S4	200	53.2 (10.7)	199	12.7 (1.5)	177	20.7 (4.5)	177	4.0 (2.1)	200	1.0	65	32.5

^aFigures for the median have been substituted to those of means for this particular variable because of the presence of a few outliers skewing the overall distribution.

S1 = September 2003 survey; S2 = January 2004 survey; S3 = January 2005 survey; S4 = January 2006 survey.
n = number of women sampled; n/a = no sample taken.

detected. Overall, the prevalence of utilization increased between surveys S1 and S4, but such a trend may be largely attributable to the inclusion of subgroups from Beirut city and suburbs. Detailed comparisons in surveys S3 and S4 indicated that the rate of mammography use among women in greater Beirut was almost twice as high as among women from outside. In most cases, utilization results fluctuated, except for the Chouf area where they remained relatively low (about 10%) across all 4 waves. In survey S2, utilization was the lowest in the Zahleh, Sour and Chouf districts (9% to 10%). It was 22% in the Batroun area, and was the highest (29%) in Akkar. In contrast, in survey S4, utilization was lowest in Akkar (6%). It was 12% in Chouf, 16% in Zahleh and Sour and 20% in Batroun. The highest levels were noted in Beirut city and suburbs (25%).

At all waves, among women who had done a mammography in the previous 12 months, a large proportion had obtained it for the first time in their life (Table 2). The proportions ranged from a low of 43.6% (survey S3) to a high of 66.7% (survey S4). No data were obtained from survey S1. Increasing trends for first-ever utilization could be found over time in almost all areas surveyed. The proportion of first-time users was consistently higher among women in the regions compared to those from Beirut city and suburbs (Table 2).

Mammography utilization by age

At any single wave, utilization was low, but less so among women aged 40–59 years than among younger or older ones. In particular, in survey S4, significantly lower rates of utilization were found among women aged < 35 years (12.4%) or 60+ years (11.4%), while significantly higher proportions were found among women aged 40–49 years (21.8%) and 50–59 years (21.5%). No other trends

Table 2 Utilization of mammography in the previous 12 months in 4 consecutive surveys and first ever utilization in 3 consecutive surveys among Lebanese women

Area/survey	Utilization of mammography in previous 12 months			First ever utilization of mammography		
	n/N	% (95% CI) ^a	P-value ^b	n/N	% (95% CI) ^a	P-value ^b
Outside Beirut						
<i>Akkar</i>						
S1	21/200	10.5 (6.3–14.7)	0.655	n/a	n/a	–
S2	58/200	29.0 (22.7–35.3)	< 0.001	34/56	60.7 (47.9–73.5)	0.363
S3	22/160	13.8 (8.4–19.1)	0.12	13/22	59.1 (38.5–79.6)	0.122
S4	10/160	6.3 (2.5–10.0)	< 0.001	8/10	80.0 (55.2–100)	0.316
<i>Batroun</i>						
S1	26/200	13.0 (8.3–17.7)	0.44	n/a	n/a	–
S2	44/200	22.0 (16.3–27.7)	0.001	20/44	45.5 (30.7–60.2)	0.112
S3	23/160	14.4 (8.9–19.8)	0.181	15/23	65.2 (45.7–84.7)	0.027
S4	32/160	20.0 (13.8–26.2)	< 0.424	22/32	68.8 (52.7–84.8)	0.882
<i>Chouf</i>						
S1	20/200	10.0 (5.8–14.2)	0.49	n/a	n/a	–
S2	20/200	10.0 (5.8–14.2)	0.038	11/20	55.0 (33.2–76.8)	0.894
S3	17/160	10.6 (5.8–15.4)	0.008	8/17	47.1 (23.3–70.8)	0.763
S4	19/160	11.9 (6.9–16.9)	0.0367	12/19	63.2 (41.5–84.8)	0.663
<i>Zahleh</i>						
S1	31/400	7.8 (5.1–10.3)	0.005	n/a	n/a	–
S2	37/400	9.3 (6.4–12.1)	< 0.001	22/37	59.5 (43.6–75.3)	0.608
S3	30/160	18.8 (12.7–24.8)	0.279	9/30	30.0 (13.6–46.4)	0.106
S4	26/160	16.3 (10.5–22.0)	0.594	21/26	80.8 (65.6–95.9)	0.126
<i>Sour</i>						
S1	38/200	19.0 (13.6–24.4)	< 0.001	n/a	n/a	–
S2	18/200	9.0 (5.0–13.0)	0.012	10/17	58.8 (35.4–82.2)	0.788
S3	19/160	11.9 (6.9–16.9)	0.027	13/19	68.4 (47.5–89.3)	0.022
S4	26/160	16.3 (10.5–22.0)	0.594	20/25	80.0 (64.3–95.7)	0.159
<i>Total</i>						
S1	136/1200	11.3 (9.5–13.1)	–	n/a	n/a	–
S2	177/1200	14.8 (12.7–16.8)	–	97/174	55.7 (48.4–63.1)	–
S3	111/1200	13.9 (11.5–16.3)	< 0.001	58/111	62.3 (43.0–81.5)	0.009
S4	113/1200	14.1 (11.7–16.5)	< 0.001	83/112	74.1 (66.0–82.2)	0.032
Greater Beirut						
<i>Beirut city</i>						
S1	n/a	n/a	–	n/a	n/a	–
S2	n/a	n/a	–	n/a	n/a	–
S3	51/200	25.5 (19.5–31.5)	< 0.003	17/51	33.3 (20.4–46.3)	0.092
S4	51/200	25.5 (19.5–31.5)	0.002	24/50	48.0 (34.1–61.8)	< 0.001

Table 2 Utilization of mammography in the previous 12 months in 4 consecutive surveys and first ever utilization in 3 consecutive surveys among Lebanese women (concluded)

Area/survey	Utilization of mammography in previous 12 months			First ever utilization of mammography		
	n/N	% (95% CI) ^a	P-value ^b	n/N	% (95% CI) ^a	P-value ^b
<i>Beirut suburbs</i>						
S1	n/a	n/a	—	n/a	n/a	—
S2	n/a	n/a	—	n/a	n/a	—
S3	56/200	28.0 (21.8–34.2)	< 0.001	20/56	35.7 (23.2–48.3)	0.169
S4	49/200	24.5 (18.5–30.5)	0.006	35/48	72.9 (60.3–85.5)	0.372
<i>Total</i>						
S1	n/a	n/a	—	n/a	n/a	—
S2	n/a	n/a	—	n/a	n/a	—
S3	107/400	26.8 (22.4–31.1)	< 0.001	37/107	34.6 (25.6–43.6)	0.009
S4	100/400	25.0 (20.8–29.2)	< 0.001	59/98	60.2 (50.5–69.9)	0.032
<i>All areas</i>						
S1	136/1200	11.3 (9.5–13.1)	—	n/a	n/a	—
S2	177/1200	14.8 (12.7–16.8)	—	97/174	55.7 (47.6–62.4)	—
S3	218/1200	18.2 (16.0–20.3)	—	95/218	43.6 (37.0–50.2)	—
S4	213/1200	17.8 (15.6–19.9)	—	142/210	67.6 (61.3–73.9)	—

^aPercentage of women who had a mammography in the previous year, with corresponding 95% confidence interval.

^bObtained from a z-test or Fisher exact test comparing the prevalence in 1 group to the prevalence in all others combined, or the prevalence outside Beirut compared to the prevalence in Greater Beirut.

S1 = September 2003 survey; S2 = January 2004 survey; S3 = January 2005 survey; S4 = January 2006 survey. n/N = no. of women /total no. of women sampled; n/a = no samples taken.

existed across waves (Table 3). As expected, the proportion of first-time users among women who obtained a mammography in the past 12 months decreased with older age groups. This trend was consistent across the 3 waves in which this variable was assessed (Table 3).

Overall impact of breast cancer awareness campaigns

The overall impact of the campaigns has been measured since survey S3 (Table 4). Overall, more than 50% of participants mentioned that they had heard about the ongoing campaign at each given time. In all areas, the proportion of women who had heard of the breast cancer awareness campaigns increased consistently between

surveys S3 and S4, except in Akkar. The impact was highest in Beirut city and suburbs. In the suburbs, the proportion in survey S3 was already relatively high (69%) and thus could improve by only a small fraction to 70%.

Given that they had heard about the campaign, the proportion of women who were actually prompted to action was relatively low. While increasing in total from surveys S3 to S4 (9.7% and 14.3% respectively), those figures did not increase in Beirut city and suburbs (Table 4). In fact between surveys S3 and S4, the proportion of women prompted to action in Beirut city decreased from 22% to 19%, and in the suburbs from about 14% to 12%. Further analysis in surveys S3 and S4 confirmed the

Table 3 Utilization of mammography in the previous 12 months in 4 consecutive surveys and first ever utilization in 3 consecutive surveys among Lebanese women according to age

Age group/ survey	Utilization of mammography in previous 12 months			First ever utilization of mammography		
	n/N	% (95% CI) ^a	P-value ^b	n/N	% (95% CI) ^a	P-value ^b
< 40 years						
S1	n/a	n/a	n/a	n/a	n/a	—
S2	n/a	n/a	n/a	n/a	n/a	n/a
S3	33/329	10.0 (6.8–13.3)	< 0.001	22/33	66.7 (50.6–82.8)	0.018
S4	25/202	12.5 (7.6–17.3)	0.028	21/25	84.0 (69.6–98.4)	0.062
40–49 years						
S1	77/713	10.8 (8.5–13.1)	0.394	n/a	n/a	—
S2	99/663	14.9 (12.2–17.6)	0.885	58/96	60.4 (50.6–70.2)	0.198
S3	85/420	20.2 (16.4–24.1)	0.172	37/85	43.5 (33.0–54.1)	0.991
S4	96/441	21.8 (17.9–25.6)	0.005	69/93	74.2 (65.3–83.1)	0.069
50–59 years						
S1	31/208	14.9 (10.1–19.7)	0.085	n/a	n/a	—
S2	46/283	16.2 (12.0–20.5)	0.418	24/45	53.3 (38.8–67.9)	0.705
S3	51/210	24.3 (18.5–30.1)	0.011	21/51	41.2 (27.7–54.7)	0.693
S4	61/284	21.5 (16.7–26.2)	0.06	35/61	57.4 (45.0–69.8)	0.042
≥ 60 years						
S1	29/276	10.5 (6.9–14.1)	0.577	n/a	n/a	—
S2	32/250	12.8 (8.7–16.9)	0.325	15/32	46.9 (29.6–64.2)	0.263
S3	49/241	20.3 (15.2–25.4)	0.329	15/49	30.6 (17.7–43.5)	0.038
S4	31/273	11.3 (7.6–15.1)	0.002	17/31	54.8 (37.3–72.4)	0.099
All ages						
S1	137/1197	11.4 (9.6–13.2)	—	n/a	n/a	—
S2	177/1196	14.8 (12.8–16.8)	—	97/173	56.1 (48.7–63.5)	—
S3	218/1200	18.2 (16.0–20.3)	—	95/218	43.6 (37.0–50.2)	—
S4	213/1200	17.8 (15.6–19.9)	—	142/210	67.6 (61.3–74.0)	—

^aPercentage of women who had a mammography in the previous year, with corresponding 95% confidence interval (95% CI)

^bObtained from a z-test or Fisher exact test, depending on the situation, comparing the prevalence in 1 group to the prevalence in all others combined.

S1 = September 2003 survey; S2 = January 2004 survey; S3 = January 2005 survey; S4 = January 2006 survey. n/a = no sample taken.

impression that the proportion of women who had heard of the campaigns was significantly higher in greater Beirut than in other regions. Changes have been found regarding the effect of those campaigns in prompting action. The difference between greater Beirut and other regions vastly decreased between surveys S3 and S4.

Discussion

Annual national campaigns in Lebanon, usually held in October, have been promoting the utilization of mammography to screen for breast cancer among women aged 40+ years. There are no readily available data concerning mammography utilization

Table 4 Overall impact of breast cancer awareness campaigns among Lebanese women in 2 consecutives surveys

Area/survey	Heard about last breast cancer campaign			Heard about last breast cancer campaign and had a mammography as a result		
	n/N	%	P-value ^a	n/N	%	P-value ^a
Outside Beirut						
<i>Akkar</i>						
S3	87/160	54.4	0.347	6/87	6.9	0.347
S4	70/160	43.8	< 0.001	10/64	15.6	0.705
<i>Batroun</i>						
S3	77/160	48.1	0.448	2/77	2.6	0.025
S4	105/160	65.6	0.275	10/105	9.5	0.319
<i>Chouf</i>						
S3	74/160	46.3	0.205	3/74	4.1	0.082
S4	84/160	52.5	0.01	11/83	13.3	0.824
<i>Zahleh</i>						
S3	61/160	38.1	< 0.001	3/61	4.9	0.081
S4	97/160	60.6	0.76	15/96	15.6	0.635
<i>Sour</i>						
S3	61/160	38.1	< 0.001	1/61	1.6	0.025
S4	84/160	52.5	0.01	11/81	13.6	0.896
<i>Total</i>						
S3	360/800	45.0	<0.001	15/360	4.2	< 0.001
S4	440/800	55.0	<0.001	57/429	13.3	0.356
Greater Beirut						
<i>Beirut city</i>						
S3	113/200	56.5	0.084	25/113	22.1	< 0.001
S4	159/199	79.9	< 0.001	30/159	18.9	0.049
<i>Beirut suburbs</i>						
S3	138/200	69.0	< 0.001	19/138	13.8	0.063
S4	141/200	70.1	0.005	17/140	12.1	0.47
<i>Total</i>						
S3	251/400	62.8	< 0.001	44/251	17.5	< 0.001
S4	300/399	75.2	< 0.001	47/299	15.7	0.356
All areas						
S3	611/1200	51.0	—	59/611	9.7	—
S4	740/1199	61.7	—	104/740	14.3	—

^aObtained from a z-test or Fisher exact test, depending on the situation, comparing the prevalence in 1 group to the prevalence in all others combined.

S3 = January 2005 survey; S4 = January 2006 survey.

n/N = no. of women/total no. of women sampled.

in Lebanon and the Arab world. A key indicator for success of such campaigns is the percentage of those who underwent a mammogram within an interval recommended by professional organizations. Data collected from 1200 women with a mean age of 50 years, across various regions of Lebanon, from 4 consecutive surveys assessing the awareness campaigns between 2003 and 2005, indicated that the proportion of "proper" utilization within the previous 12 months was low and increased only slightly over time (11% to 18%).

Prior to our study, only 1 report could be located in Lebanon [unpublished report, Hariri Foundation, 2001]. It involved 315 women of the same average age, surveyed in Beirut and Saida in 2001. That report found an even lower proportion of mammography utilization (7%) within the previous 12 months. These figures may indicate that progress in awareness and utilization may be occurring in Lebanon, even if at a very slow pace, and with regional and age differences. This progress can be largely attributed to the national October campaigns which remain the only concerted effort conducted in Lebanon on the issue of breast cancer. The campaigns are actually acting as triggers for activities implemented by various nongovernmental organizations throughout the year to promote mammography and facilitate obtaining it in various subpopulations of women in Lebanon.

The rate of recent mammography utilization is definitely higher in more developed nations, around 70% in the United States [6,7] and France [8,9]. On the other hand, Lebanese rates are nearer to those in developing nations. In Istanbul, Turkey, a country socioeconomically and sociologically comparable to Lebanon, the rate of undergoing a recommended mammography in 2003 was 12.6% [10]. As prevention and awareness efforts are repeated and improved, and ob-

stacles defined and removed, we can hope that utilization rates will improve to equal those of more developed nations.

It is most important that women in the age group 40–60 years abide by recommendations for an annual breast mammography. This is the age group likely to benefit the most from screening, and in whom mammography is systematically recommended in Lebanon and elsewhere. Studies have shown that screening mammography in women in this age group decreased mortality by about 20%–35% [11]. It was reassuring to find that, in all waves, mammography utilization in women aged 40–60 years was almost twice as high as in both younger and older women. Nevertheless, messages should be clearly sent to women with a family history of breast cancer to start having a mammogram as early as 35 years [12]. With increasing life expectancy in Lebanon, as elsewhere, more women will be reaching the 60+ years age group. They will be expected to live a healthy life and cannot be neglected as potential beneficiaries of breast cancer screening [13].

Repeat mammography is also an important indicator for the greatest population-level benefits on breast cancer morbidity and mortality [14]. In the first survey (S1) only 2.2% of women said they had had more than 1 mammogram in the past. This rate is negligible compared with the rate of 25% in Turkey [15] and 40% in the United States of America in the same period [16]. The existence of fluctuations in repeat mammography across all years and within regions may be attributed to a false sense of security acquired from a first "normal" mammogram, which then acts as a disincentive to obtaining another one in the absence of any perceived breast changes. Therefore, campaigns should clearly indicate the need for repeating the test even if the results were negative in the previous year. Starting with

the 2007 campaign, advertisements have emphasized this point consistently.

Overall, the campaigns were less effective in the regions outside greater Beirut and their prompting effect was lower. Rates of adequate utilization were also lower. However, not all regions were equally affected. Those with larger rural populations such as Chouf and Akkar had worse indicators than areas with some urban centres such as Zahleh and Sour. This seems to indicate that obtaining a mammography in some areas may be hampered by logistic obstacles such as availability, affordability and access. Other negative factors may be related to values, expectations and beliefs of women in various regions of Lebanon. Those issues are currently under investigation using data collected in the same surveys.

In conclusion, the breast cancer campaigns focusing on the importance of annual screening mammography are having a small

yet measurable impact on women's practice in Lebanon. While progress is expected to remain slow for several years, it has to be sustained until a critical mass of women has acquired the regular habit and annual mammography has become the norm in Lebanon. It is hoped that publishing such data may prompt similar efforts to initiate screening campaigns in other parts of the Arab world where breast cancer is on the rise.

Acknowledgements

The activities of the National Breast Cancer Awareness Campaigns are conducted under the umbrella of the Ministry of Public Health in Lebanon, and largely funded through grants from Roche International. The survey data collection and entry was conducted by Statistics Lebanon, a private survey company in Beirut.

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Correction

Knowledge of and attitudes towards HIV/AIDS in Mashhad, Islamic Republic of Iran by M.R. Hedayati-Moghaddam. *Eastern Mediterranean Health Journal*, 2008, 14(6):1321–32. The affiliation should read: Research Centre for HIV/AIDS & Viral Hepatitis, Iranian Academic Centre for Education, Culture & Research (ACECR), Mashhad Branch, Ferdowsi University Campus, Mashhad, Islamic Republic of Iran. On page 1324, Results section, paragraph 1, last line, the correct phrase is: almost half (49.9%) (not 49.5%) had high school education.