Uptake of breast cancer screening measures among immigrant and Swiss women in Switzerland

Marina Fontana, Alexander Bischoff[a]

[a] Institute of Nursing Science, University of Basel, Switzerland

Summary

Background: Early detection of breast cancer plays a crucial role in survival, and in most developed countries immigrant women present for treatment at a later stage of the disease. Compared to the indigenous population, immigrant women have a lower uptake of breast cancer prevention services. The situation for immigrant women in Switzerland is compounded by the fact that all women living in Switzerland are at major risk of developing breast cancer during their lifetime.

Question under study: Our study aimed to detect disparities in uptake of preventive methods such as mammography, clinical breast examination (CBE) and breast self-examination (BSE) among women from the four major immigrant groups Italy, Spain, former Yugoslavia and Portugal, compared to the native population in Switzerland.

Methods: This study is a secondary analysis of data from the 2002 Swiss Health Survey, a nationwide cross-sectional telephone survey. The self-reported questionnaires addressed immigrant and Swiss women of age 20 and over (n = 9,790). Descriptive statistics were used to describe the demographic characteristics of the sample. The dichotomous variables of interest, mammography, CBE and BSE were adjusted for nationality and further sociodemographic factors using logistic regression, with Swiss women serving as the comparison group.

Results: Main predictors for mammography uptake were higher income and older age. For the use of CBE, lower age, higher income and nationality were the strongest predictors. Women from former Yugoslavia (OR = 2.6) and Portugal (OR = 2.8) more frequently stated that they did not receive CBE compared to Swiss females (p = 0.011). BSE is linked to a higher socioprofessional status and to nationality. Women from Italy (OR = 1.62) and former Yugoslavia (OR = 2.6) perform BSE significantly less often than Swiss women (p = 0.0001).

Conclusion: Differences exist in the use of mammography, CBE and BSE among the four major foreign nationality groups living in Switzerland compared to Swiss nationals. Immigrant and low-income women might draw benefit from a systematic and culturally adapted breast cancer screening programme to overcome disparities in access to screening.

Key words: ethnicity; migrants; breast cancer; disparity; mammography; clinical breast examination; breast self-examination

Introduction

Breast cancer is the most common cause of death among women in Switzerland.

According to the 2006 estimates of the Swiss Cancer League [1], 5300 new cases of breast cancer are diagnosed each year, with future estimates showing a rising trend [2].

Despite the recent increase in overall rates of mammogram use in industrialised countries, uptake of breast cancer preventive measures remains persistently low among ethnic minorities [3–5]. The Federal Office of Public Health (FOPH), in collaboration with the World Health Organisation, has developed a migration-specific strategy called *Migration and Public Health*. This strategy aims to address and reduce health disparities by offering a health care system that is accessible for all. This five-field intervention strategy suggests priorities to be set in the domains of prevention, education, research, health promotion and therapy for traumatised asylum seekers [6].

Switzerland is affected by major immigration flows as well as by long term and short term migration [7]. Immigrants account for approximately one fifth (1,655,300) of the residential pop-

ulation of Switzerland [8]. They form a fast growing, heterogeneous community with a variety of nationalities, languages and cultural traditions. Specific nationality groups within the female immigrant population have rarely been investigated. Knowledge of their health-related behaviour, in particular regarding preventive measures such as mammography, clinical breast examination (CBE) and breast self-examination (BSE), is small and has, as yet, not been addressed in detail.

Women living in Switzerland are at high risk of developing breast cancer. One out of ten women will develop this disease during their lifetime [9]. Despite high incidence rates for breast cancer, death rates have shown slight decreases since 1985, due to earlier detection and improved treatment [2]. The French-speaking region of Switzerland offers canton-wide breast cancer screening, but no national screening programme exists. Routine opportunistic mammography screening is common for most cantons [10]. Moreover, health insurance does not reimburse individual mammography screening.

The effectiveness of breast cancer screening is well established and has been investigated for over 30 years. The Swiss Cancer Society considers high quality mammography to be the most important and specific method of predicting breast cancer [1, 2]. Despite controversy as to the benefits of mammography [11], screening mammography is the most efficient and cost-effective tool in detecting cancer at an asymptomatic stage and subsequently reducing mortality [2, 4, 12–14]. The effectiveness of screening in lowering breast cancer mortality is however only established for mammography, and is greatest for women aged 50–69 [14, 15]. CBE and BSE remain additional tools for diagnostic purposes and represent non-invasive options [16].

People living in poverty or belonging to an ethnic minority face several disadvantages when they are affected by cancer [6, 17–19]. This means that women from ethnic minorities living in developed countries present with more advanced stages of the disease [20] and are treated less aggressively compared to women from the indigenous population [21, 22]. Bisig et al. [23] confirmed that preventive measures such as CBE and Pap smear are performed less frequently in immigrant women, and these results remained significant after allowing for sociodemographic factors. The Swiss Health Survey conducted in 1992 and 1997 did not provide sufficient data on specific nationality groups to draw reliable conclusions concerning preventive measures and breast cancer. In this research paper, baseline data from the Swiss Health Survey 2002 (SHS) has been analysed to detect variability in the self-reported use of (1) mammography, (2) CBE, and (3) BSE among major nationality groups living in Switzerland as compared to the Swiss population.

Methods

Research design, sample, data collection

The present study is based on exploratory secondary analysis of data from the 2002 SHS, a cross-sectional household survey. The SHS targets the general population in Switzerland and provides representative information on demographic characteristics and health-related behaviour. The stratified random sample consisted of 32,868 individuals. The participation rate was 64%, resulting in a final sample of 19,706 residents aged 15–74 years. Persons were excluded if they did not understand one of the indicated languages (German, French, Italian) or could not be contacted by phone. Trained staff performed computer-assisted telephone interviews and participants were requested to fill in the questionnaires following the interview [24].

Variables and Measurement

The instrument used for data gathering was the 2002 SHS questionnaire. Items from the questionnaire, addressing the use of mammography, CBE and BSE were included for analyses. Sociodemographic characteristics of the sample consisted of five variables: nationality, age, educational level, socioprofessional category and income. The main variable of interest was nationality, defined by the women's citizenship. The variable *age* has been classified into four different age groups (20–34, 35–49, 50–64 and ≥65 years) and in a continuous form. The continuous variable income refers to the *equivalent income* and is considered in research literature to specify the distribution of earnings [25]. Education and occupational status consisted of four different categories each and were parameters set by the Swiss Federal Statistical Office (SFSO). Education referred to level of schooling completed and/or university degree earned by a participant, and included four levels. Occupational status was divided into *management* (e.g. highly qualified professions), *white collar*, *blue collar* and *manual unskilled* (e.g. craftsperson). For the present study the main questions of interest related to the self-reported uptake of the above-mentioned preventive measures. According to the 2002 SHS questionnaire items, women aged twenty years and older were asked *have you ever had a mammogram?* and *have you ever had a clinical breast examination?* Participants could answer by either *I don't know*, *yes* or *no*. Self-examination was addressed by the question *how often do you perform BSE?*

Statistical analyses

Depending on the level of data (interval or nominal), parametric or nonparametric tests were employed. Data from the Swiss women was used as the comparison group. Initially, sociodemographic characteristics of the participants were described by mean age, mean income, category of age-group as well as categories of education and occupation. In a second step Chi square tests (Pearson's) were performed to determine the relationship between independent variables and outcomes of interest. For our purposes all three outcome variables, mammography, CBE and BSE, were dichotomised (yes/ no) [26].

In a third step, logistic regression was used to predict the presence/absence of the outcome variables mammog-

raphy, CBE, BSE based on the predictor variables nationality, age, income, education and socioprofession. Multicolinearity was checked in advance by the correlation of estimates test. Statistical procedures were carried out by SPSS (Statistical Package for Social Sciences) Version 11.0. Level of significance was set at p <0.05.

Ethical considerations

Data were de-identified. We obtained permission to analyse and publish the data via contract # 04/100 05 04 04 (title: "Towards improving outcomes for migrant patients with chronic illness") with the Swiss Federal Statistical Office.

Results

The subsample of the present study includes 9,790 women aged 20 years or over, and represents the largest nationality groups living in Switzerland: Italians, nationals from former Yugoslavia (including Serbs, Montenegrins, Croats, Bosnians, Kosovaris and Macedonians), Spanish, Portuguese and Swiss nationals. Owing to small sample sizes, women from Turkey and Albania could not be included in our study. Also excluded were participants from Germany and France, since the uptake of breast cancer screening measures by these two nationality groups was previously found to be comparable to, and not significantly different from, those of the Swiss population [5].

Nationality groups consisted of 9,193 Swiss (93.9%), 316 Italian (3.2%), 111 Yugoslav (1.1%), 85 Spanish (0.9%) and 85 Portuguese (0.9%). Table 1 shows the sociodemographic characteristics of the sample. Swiss women have the highest mean age, present the highest level of education, are represented most frequently in the management section and earn the highest income compared to all other nationality groups.

Table 2 shows the rates of mammography, CBE and BSE use resulting from the frequency tables. Women from Yugoslavia have mammographies at a comparatively low rate (16.7%). Results for CBE differ to a minor extent between nationality groups, with Swiss women showing an uptake of 93.8% compared to Portuguese women with 90%. In regard to BSE, Swiss women show

the highest rate (85.2%) compared to women from former Yugoslavia, who have the lowest (71.9%).

The covariate *nationality* was not a factor in explaining the absence of mammogram use.

Income and age were the only significant predictors of the probability of *never having had a mammography*. The higher the income (OR = 0.998) and the higher the age (OR = 0.955), the lower the probability of never having had a mammography.

The absence of CBE could not be explained by nationality for the Italians and Spaniards. Women from former Yugoslavia (OR = 2.6) and Portugal (OR = 2.8) were significantly less likely to have ever had a CBE compared to Swiss females. The probability of never having had a CBE increases with age (OR = 1.025) and decreases with higher income (OR = 0.998). No significant correlation existed between the socioprofessional and educational categories.

Logistic regression for BSE shows significant results for Italians (OR = 1.62) and former Yugoslavs (OR = 2.6), who report, more frequently than Swiss women, that they *never perform BSE*. The outcome variable *never performed BSE* decreases with more qualified professional status (OR = 0.91). Income, education and age did not prove to be predictors. Table 3 shows the results of the logistic regression analyses for all three outcome variables.

Table 1

Sociodemographic characteristics of analysed subsample from the 2002 SHS, women age ≥20, N = 9,790.

		Total	Swiss	Italians	Former Yugoslavs	Spaniards	Portuguese	Significance
		N = 9790	N = 9193	N = 316	N = 111	N = 85	N = 85	P[1]
Age Group	20–34	19.3%	18.5%	25.6%	40.5%	31.8%	44.7%	
	35–49	28.5%	28.0%	26.9%	48.6%	39.8%	49.4%	
	50–64	26.7%	27.0%	27.2%	9.9%	23.5%	4.7%	0.0001
	≥65	25.6%	26.5%	20.3%	0.9%	5.9%	1.2%	
	Mean (SD)	51.3(17)	52(17)	48.5(16)	37(9)	42(13)	36(8)	
Education[c]	No education	2.1%	2%	5.4%	5.4%	2.4%	1.2%	
	Primary school	21.9%	20.2%	46.0%	43.2%	35.3%	72.9%	
	Secondary school	66.8%	68.3%	44.6%	44.2%	54.1%	25.9%	0.001
	Tertiary school	9.1%	9.6%	3.8%	7.2%	8.2%	0%	
	No answer[2]	0.1%	0.1%	0.2%	0%	0%	0%	
Occupational status	Management	33.9%	34.7%	19.2%	25.7%	22.9%	19.5%	
	White collar	38%	38.8%	29.8%	21.9%	27.7%	35.4%	
	Blue collar	6.5%	6.7%	3.1%	1.0%	4.8%	2.4%	0.0001
	Manual unskilled	20.3%	18.7%	45.2%	49.5%	42.2%	41.2%	
	No answer[2]	1.3%	1.2%	2.7%	1.9%	2.4%	1.2%	
Income	Mean (CHF)	3.581	3.628	2.763	3.048	3.064	2.752	
	SD	2.018	2.036	1.485	1.711	1.659	1.371	

[1] p (χ^2) for the differences across nationality groups, sign. P values <0.05
[2] No answer including don't know

Table 2

Prevalence (%) and number of self-reported preventive measures (mammography, CBE & BSE) of subsample of the 2002 SHS, women aged ≥20, grouped by nationality.

Mammography	yes n	%	Dont know[1] n	%	total n	%	P value
Swiss	2,312	34.1	33	0.5	6,773	94.4	< 0.006
Italians	62	29.8	2	1	208	2.9	
Former Yugoslavs	12	16.7	1	1.5	72	1.0	
Spaniards	19	31.7	0	0	60	0.8	
Portuguese	14	23	0	0	61	0.9	
Total	2419	33.7	36	0.5	7,174	100	
Clinical Breast Examination (CBE)	n	%	n	%	n	%	
Swiss	8,456	93.8	42	0.5	9,011	94.2	<0.001
Italian	283	92.5	3	0.5	306	3.2	
Former Yugoslavs	81	91	1	1.1	89	0.9	
Spaniards	73	93.6	0	0	78	0.8	
Portuguese	72	90	0	0	80	0.8	
Total	9,011	94	46	0.5	9,564	100	
Breast Self- Examination (BSE)	n	%	n	%	n	%	
Swiss	7,681	85.2	69	0.5	9,011	94.2	<0.014
Italian	243	79.4	3	1	306	3.2	
Former Yugoslavs	64	71.9	2	2.2	89	0.9	
Spaniards	65	83.3	1	1.3	78	0.8	
Portuguese	69	86.3	0	0	80	0.8	
Total	8,122	84.9%	75	0.6	9,564	100	

[1] Don't know, including no answer.

Table 3

Factors associated with self-reported mammogram, Clinical Breast Examination and Breast Self-Examination use. Probability of never had a mammogram, CBE or BSE. Odds ratios (OR) and 95% confidence intervals (CI) were computed using logistic regression models.

		Mammography OR[1]	95% CI[2]	Sig.[3]	Clinical Breast Examination OR	95% CI	Sig.	Breast Self-Examination OR	95% CI	Sig.
Nationality	Swiss (referent)	1		0.53	1		0.011	1		0.0001
	Italians	0.95	0.66–1.34	0.74	1.34	0.81–2.21	0.26	1.63	1.18–2.24	0.003
	Former Yugoslavs	1.12	0.59–2.15	0.73	2.56	1.16–5.69	0.02	2.62	1.58–4.33	0.0001
	Spaniards	0.64	0.35–1.2	0.15	1.80	0.71–4.57	0.21	1.06	0.52–2.17	0.864
	Portuguese	0.74	0.39–1.39	0.15	2.83	1.26–6.34	0.012	1.08	0.55–2.15	0.814
Income[4]		0.998	0.993–0.999	0.0001	0.998	0.993–0.999	0.001	0.9998	0.9993–0.9999	0.303
Age[5]		0.955	0.951–0.958	0.0001	1.025	1.019–1.032	0.0001	1.0	0.996–1.004	0.483
Education[6]		0.98	0.87–1.1	0.69	0.978	0.811–1.179	0.82	0.93	0.822–1.05	0.267
Occupational status[7]		1.01	0.95–1.060.86	1.04		0.949–1.14	0.39	0.912	0.856–0.972	0.005

[1] Odds ratio;
[2] Confidence intervals
[3] Significance /p values <0.05
[4] Income per CHF 10,000;
[5] Age per 10 years
[6] Reference level for education is tertiary level
[7] Reference level for occupational status is management

Table 4

Mammography uptake, women aged >50, n = 3098, sample dichotomised into Swiss residents vs foreigners and stratified by Swiss language regions.

	Total n	%	Swiss n	Residents %	Foreigners[1] n	P value[2] %	
Mammography yes	1,659	53.6.	161	53.4	47	60.3	n.s[3]

	Total n	%	Language region				
Mammography yes	1,659	53.6.	Swiss German n %	French n %	Italian n %	.001	
			1,152 49.2	387 69.1	120 61.2		

[1] Foreigners including women from Italy, former Yugoslavia and Spain
[2] P value <0.05
[3] Not significant p >0.229

Chi2 tests were applied to determine differences across nationality groups and language regions (sign. <0.05).

The subsample of the groups investigated includes 3,098 women aged 50 years and over. Non-Swiss nationality groups were combined into one group labelled as foreigners. Results show the mammography utilisation with a higher uptake for foreigners (60.3%) compared to Swiss citizens (53.4%), but the results were not significant (p0.229).

Results for mammography uptake by language region indicate the highest uptake (69.1%) for French-speaking Switzerland compared to the German-speaking region (49.2).

Discussion

Uptake of mammography, CBE and BSE are important components of preventive behaviour and indicators of access to health care for women. Unlike most studies investigating only one of the breast cancer screening measures, this paper examined all three methods in relation to screening prevalence rates and factors predictive of uptake. Analyses of former SHS data generally considered females of various nationalities as one single group, labelled as immigrants or foreign nationals. This study investigated recourse to mammography, CBE and BSE among women of four major nationality groups compared to Swiss nationals. Results provide evidence of important differences in use of all three preventive methods among females of the four nationalities mentioned. Mammography, CBE and BSE uptake appear to have varying sociodemographic predictors.

While self-reported uptake of mammography cannot be predicted by the nationalities investigated, the variables age and income are significant. Younger females with lower incomes are less likely to have a mammogram than older females and those with higher earnings. Previous research identified older age as a relevant factor for mammography uptake [24, 27]. This can be explained by the fact that physicians in Switzerland generally recommend mammograms for women in the 50-year and over age group. In our study all immigrant participants have a lower mean age and thus do not yet belong to this target group. Demographic changes in European populations are marked by aging and migration. For the future provision of breast cancer screening services both aspects will become important. In this study lower income is one of the strongest determinants for non-use of mammography and absence of CBE, whereas BSE, a self-administered measure, is clearly not affected by income. These results are supported by the results from the 1997 SHS, where female immigrants and lower income groups make less use of preventive measures [23]. Further, international studies have identified low income as a strong predictor for underuse of mammography screening among ethnic minorities [28, 29]. International investigations [29, 30] have shown that membership of an ethnic minority is predictive of lower mammography use when compared to the indigenous population. This evidence, however, cannot automatically be applied to Switzerland and comparisons should be treated with caution. US minorities are often categorised as "Black" and "Hispanic" populations. In contrast, the Swiss migration population consists of nationalities primarily from Southern Europe, Turkey or diverse ethnicities from former Yugoslavia. However, mammography screening has the highest impact on mortality and furthermore is cost-effective in the long run.

Our study supports the idea that older women with lower income undergo CBE less frequently than younger women on higher earnings. For females from former Yugoslavia and Portugal the probability of not undergoing CBE is up to three times higher than for Swiss women. A recently conducted Swiss study (2007) found that older women in general are less concerned about breast cancer prevention and receive less CBE [31]. An international research paper on the topic [32] supports our results. Low income seems to be one of the strongest predictors in national and international investigations examining underuse of CBE and mammography [23, 33].

The present study suggests that participants from Italy and former Yugoslavia, as well as women with a lower occupational status, are less likely to perform BSE. Age, income and education are not linked to BSE, a fact mirrored by one study from Australia [34]. Two national studies investigated the patterns of BSE among Swiss women. Glaus et al. [9] reported major regional differences in BSE utilisation. Prevalence is higher in the German-speaking area of Switzerland compared to the French region. International studies observed that ethnic minority females with lower socioeconomic status perform BSE less than the native population [35, 36]. The literature suggests [16] that BSE is of limited effectiveness and remains an optional preventive measure that can be performed by women after instruction by a health specialist.

Further potential factors influencing breast cancer screening

A major concern of the FOPH is to overcome disparities in access to health services and to limit health risks for immigrants and deprived persons. Further research is needed to understand disparities in mammography, CBE and BSE use. Attempts should be made to address additional barriers to equitable access to and uptake of the preventive methods investigated.

In our study, education was not linked to any of the preventive methods and only occupational status was associated with BSE. Despite these findings national and international investigations suggest that health-related decisions are strongly shaped by education and socioprofessional determinants [19, 23]. Immigrant women are often exposed to disadvantages in several social domains and face discrimination in both the educational and occupational sectors. These preconditions may lead to disparities in health access and might affect the uptake of breast cancer screening services. Health literacy and health communication are important components influencing informed choice of preventive methods. Educational materials are often written at reading levels that are inappropriate for women who belong to ethnic mi-

norities. Simply understanding the recommendations for preventive examinations remains quite a challenge. Thus, in spite of media campaigns with information for the public or personal invitations, guidelines cannot be followed [37].

Clinical implications

Systematic and nationwide programmes are able to reach 70% to 90% of a target population [38]. Occasional breast cancer screening practices, as they exist in Switzerland, are less likely to cover the total population and may miss the most disadvantaged women. Additionally, it must be borne in mind that reimbursement for services such as mammograms or CBE is not guaranteed at present, and this may be experienced as a financial burden by low income women. If publicly organised mammography screenings were cost free, low-income women might be more inclined to take part in screening [39]. The establishment of systematic screening programmes could help to eliminate uneven access and would be a crucial step towards the FOPH's *Migration and Public Health Strategy* orientation. However, in Switzerland, implementation of a national breast cancer screening programme requires legal regulation by policy makers and calls for the cooperation of a variety of health care professionals.

Nevertheless, some efforts have been undertaken in Switzerland. Population-based screening programmes have been successfully introduced in the western region of Switzerland, beginning in 1999 [14]. The Swiss Cancer League offers a leaflet with instructions and illustration of BSE written in fifteen languages, and Albanian-, Bosnian- and Turkish-language versions are available online [40]. Combined efforts by various health worker groups should focus on culturally appropriate information and education, to achieve equitable access to breast cancer screening methods.

Limitations

Several factors should be considered in interpreting the results of our study. The exclusion of foreign language speakers means that recent arrivals such as asylum seekers or refugees could not provide information on their health prevention behaviours. A further limitation is that Turkish and Albanian women could not be included in our study due to the small number of women responding to this survey. As the Turkish- (5.3%) and Albanian-speaking (3.7%) populations represent two of the larger nationality groups living in Switzerland [8] they should be represented in the same proportion as in the resident population. Self-reported ratings may be overestimated [41] and are subject to measurement error. In terms of mammography, it is unknown whether participants used the service as a preventive method or whether they received a mammogram due to a previously detected abnormality.

Conclusion

Four female nationality groups living in Switzerland show significant differences in uptake of breast cancer prevention measures compared to the indigenous population. In order to achieve the *Migration and Health Strategy* goals and provide appropriate health services, major efforts need to be undertaken that are culturally sensitive and tailored to the needs of immigrants and low-income women. The provision of easy and cheap access to breast cancer screening measures such as mammography and CBE, together with future Swiss Health Surveys that do not exclude disadvantaged groups of migrant women, would be a pivotal step in narrowing health disparities. Further research is needed to identify and address screening barriers.

Correspondence:
Alexander Bischoff
Institute of Nursing Science
University of Basel
Bernoullistrasse 28
CH-4056 Basel
Switzerland
E-Mail: alexander.bischoff@unibas.ch

References

1 Krebsliga-Schweiz/Swiss Cancer League. Available at http://www.swisscancer.ch linked to http://www.breastcancer.ch/d_6_1.php. Accessed January 4, 2007.

2 Cerny T. Mammografie screening in der Schweiz. Available at: http://www.swisscancer.ch. Accessed January 16, 2007.

3 Hiatt RA, Pasick RJ, Stewart S, Bloom J, Davis P, Gardiner P, et al. Community-based cancer screening for underserved women: design and baseline findings from the Breast and Cervical Cancer Intervention Study. Prev Med. 2001;33(3):190–203.

4 Somkin CP, McPhee SJ, Nguyen T, Stewart S, Shema SJ, Nguyen B, et al. The effect of access and satisfaction on regular mammogram and Papanicolaou test screening in a multiethnic population. Med Care. 2004;42(9):914–26.

5 Rommel A, Weilandt C, Eckert J. Gesundheitsmonitoring der Schweizerischen Migrationsbevölkerung. Endbericht: WIAD, Bonn; 2006.

6 Federal Office of Public Health (FOPH). Migration and Health: The Confederation's Strategic Orientation 2002–2006. Bern: Fachstelle Migration und Gesundheit; 2002.

7 Bischoff A. Caring for migrant and minority patients in European hospitals. A review of effective interventions. Swiss Forum for Migration and Population Studies. Neuchatel; 2003.

8 Bundesamt für Statistik BFS (2006 Hrsg.). Migranten und ihre Nachkommen auf dem Arbeitsmarkt: ein Überblick. Reihe Statistik der Schweiz: Neuchatel; 2006.

9 Glaus A, Fäh B, Hornung R, Senn H, Stiefel F. Das Brustkrebspräventionsverhalten in der Schweiz: aus der Perspektive von Frauen aus drei Sprachregionen der Schweiz. Pflege. 2004; 17:385–94.

10 Wanner P, Bouchardy C, Raymond L. Mammography screening and breast self examination in Switzerland. Ann Oncol. 2001;(812):573–5.

11 Goetzsche PC, Olsen O. Is screening for breast cancer with mammography justifiable? Lancet. 2000;355:129–34.

12 Zappa M, Visoli C, Ciatto S. Mammography screening in elderly women: efficacy and cost effectiveness. Crit Rev Oncol Haematol. 2003;46(3):235–29.

13 Dündar P, Özmen C, Öztürk B, Haspolat C, Akyıldı, F, Çoban S, et al. The knowledge and attitude of breast self examination and mammography in a group of women in a rural area of western Turkey. BMC Cancer. 2006;6:43.

14 Zwahlen M, Bopp M, Probst-Hensch N. Mammography screening in Switzerland: Limited evidence from limited data. Swiss Med Wkly. 2004;136(19-20):328.

15 International Agency for Research on Cancer, WHO. Breast Cancer Screening. IARC Handbooks of Cancer Prevention, Volume 7. Lyon: IARC, 2002.

16 Harris R, Kinsinger LS. Routinely teaching breast self-examination is dead. What does this mean? J Natl Cancer Inst. 2002;94:1420–1.http://www.bmj.com/cgi/ijlink?linkType=FULL&journalCode=jnci&resid=94/19/1420

17 Bischoff A. Wanner Ph. Ein Gesundheitsmonitoring von Migranten: Sinnvoll? Machbar? Realistisch? Neuchatel: BAG; 2003.

18 Maggi J, Cattacin S. Needed Basic Research in "Migration and Health" 2002–2006 in Switzerland. Research Report für Forum für Migration und Bevölkerungsstudien. (29);2003.

19 Barlow W, White E, Ballard-Barbash R, Vacek P, Titus-Ernstoff L, Carney P, et al. Prospective breast cancer risk prediction model for women undergoing screening mammography. J Natl Cancer Inst. 2006;98:1204–14.

20 Lannin D, Matthews H, Mitchell J, Swanson M, Swanson FH, Edwards MS. Influence of socioeconomic and cultural factors on racial differences in late stage presentation of breast cancer. JAMA. 1998;(279):1801–7.

21 Velikova G, Booth L, Johnston C, Forman D, Selby P. Breast cancer outcomes in South Asian population of West Yorkshire. Br J Cancer. 2004;90:1926–32.

22 Tammemagi CM. Racial/ethnic disparities in breast and gynaecologic cancer treatment and outcomes. Curr Opin Obstet Gynaecol. 2007;19(1):31–6.

23 Bisig B, Wittlisbach V, Gmel G, Huwiler K, Dehler S, Taskin A, et al. Soziodemographische und regionale Einflussfaktoren auf die Inanspruchnahme von Gesundheitsleistungen: erste Resultate. Determinanten der Inanspruchnahme. Available at:http://www.sozialstaat.ch/global/projects/results/bisig_kurzfassung.pdf. Accessed March 10, 2007.

24 Bundesamt für Statistik BFS. Schweizerische Gesundheitsbefragung. Die Erhebungsmethoden in Kürze. Schweizerisches Bundesamt für Statistik, Reihe Statistik der Schweiz, 14 Gesundheit Neuchatel: 2005.

25 Stauder J, Hünig W. (2004). Die Messung von Aequivalenzeinkommen und Armutsquoten auf der Basis des Mikrozensus. Available from http://www.lds.nrw.de/statistik/index.html. Accessed February 5, 2007.

26 Manor O, Matthews S, Power Ch. Dichotomous or categorical response? Analysing self-rated health and lifetime social class. Int J Epidemiol. 2000;29:149–57.

27 Vikky Q, Phillips S, Hopman W. Determinants of a healthy lifestyle and use of preventive screening in Canada. BMC Public Health. 2006;6:275.

28 McAlearny A, Reeves K, Tatum C, Paskett E. Cost as a barrier to screening: mammography among underserved women. Ethnic Health. 2007;12(2):189–203.

29 O'Byrne K, Kavanagh A, Ugoni A, Diver F. (2000). Predictors for non attendance for second round mammography in an Australian mammographic screening programme. J Med Screen. 2000;7(4):190–4.

30 Lees K, Wortley P, Coughlin S. Comparison of Racial/Ethnical Disparities in adult immunisation and cancer screening. Am J Prev Med. 2005;29(5):404–11.

31 Gabadinho A, Wanner Ph, Dahinden J. La santé des populations migrantes en Suisse: une analyse des données du GMM. Swiss Forum for Migration: Neuchâtel; 2007.

32 Rodriguez M, Ward L, Perez-Stable JP. Breast and cervical cancer screening. Impact of health insurance status, ethnicity and nativity of Latinas. Ann Fam Med. 2005;(3):235–41.

33 Coleman EA, O'Sullivan P. Racial differences in breast cancer screening among women from 65–74 years of age trends from 1987–1993 and barriers to screening. J Women Aging. 2001; 13(3):23–39.

34 Savage S, Clarke V. Factors associated with screening mammography and breast self examination intentions. Health Educ Res. 1996;11(4):409–21.

35 Su X, Ma G, Sals BY, Hausmann A. Breast cancer early detection among Chinese women in the Philadelphia area. Women's Health 2006;15(5):507–19.

36 Lepecka C, Jakiel G, Krasuka M, Stanislawek A. Breast Self Examination among Polish women of procreative age and the attached significance. Cancer Nurs. 2007;30(1):64–8.

37 Garbers S, Chiasson M. Inadequate functional health literacy in Spanish as a barrier to cervical cancer screening among immigrant Latinas in New York City. Prev Chronic Dis. 2004;1(4):A07

38 De Wolf Ch. Breast Cancer Screening in Switzerland. Agence pour le développement et évaluation de politiques de santé (2006 Hrsg.). Prepared for the Swiss Cancer League. Available at http://www.breastcancer.ch/pdf/en/Ma_Ca_Screen_CdW_engl.pdf.pdf. Accessed June 7, 2007.

39 European Commission. European guidelines for quality assurance in breast cancer screening and diagnosis. Fourth edition. Perry N, Broederes M, de Wolf C, Törnberg S, Schouten J. 1-366. 2006. Brussels, Luxembourg, Office for official Publications of the European Community.

40 Krebsliga Schweiz/Swiss Cancer League. Available from http://www.swisscancer.ch linked to http://www.breastcancer.ch/d_3_1.php. Accessed May 12, 2007.

41 Holt K, Franks P, Meldrum S, Fiscella, K. Mammography self reported and mammography claims: Racial, ethnic and socioeconomic discrepancies among elderly women. Med Care. 2006;44(6):513–8.

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