Socioeconomic and healthcare use-related determinants of cervical, breast and colorectal cancer screening practice in the French West Indies

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Key-words

Cancer screening; French West Indies; breast cancer; colorectal cancer; cervical cancer; socioeconomic status; health care use

Abstract

Objective

The objective of this study was to investigate the role of socioeconomic and health care use characteristics in the participation in breast, cervical and colorectal cancer screening in the French West Indies.

Methods

We used data from a national health survey conducted in 2014 in Martinique (n=2026) and Guadeloupe (n=2028). Logistic regressions adjusted for various sociodemographic and morbidity variables were conducted. The following determinants were investigated: having hot water at home, having received income support for low income individuals during the last year, educational level, occupational class, complementary health insurance, health care renouncement and visit to the general practitioner (GP) during the last year. Multiple imputations were performed to account for missing values.

Results

We observed the following cancer screening rates: 78.1% for cervical cancer, 81.5% for breast cancer, and 59.5% (women) and 50.8% (men) for colorectal cancer. Higher cervical cancer screening participation was reported among women with qualified occupation and having visited the GP during the last year and lower participation among women who never worked. Higher screening participation was reported among subjects having hot water at home and having visited the GP during the last year for breast and colorectal (men and women) cancer. Unexpectedly, a lower colorectal cancer screening participation was found among women with qualified occupation.

Conclusion

We observed social inequalities in participation in cancer screening in the FWI, which stresses the need to continue efforts to increase screening rates in this population.

Introduction

Guadeloupe and Martinique are two French overseas territories located in the French West Indies (FWI) in the Caribbean. When compared to the national average, the FWI are characterized by a lower socioeconomic situation of the population and larger income inequalities. Despite a significant increase in the number of general practitioners (GP) over the past 15 years, medical density remains well below the national average.

Cancer epidemiological profiles differ between the FWI and mainland France but tend to move closer over time.(Dieye *et al*, 2007) Incidence rates for colorectal and breast cancer have increased in the FWI during the last two decades, but in 2012 age standardized (world) rates are still lower in the FWI (breast: 56.7 for 100000 person years, colorectal men: 21.0, colorectal women: 17.3) than in mainland France (89.7, 36.1, 24.9 respectively). On the other hand, despite a decrease in recent years, incidence rates for cervical cancer in 2012 remain higher in the FWI (10.9) than in mainland France (6.8).(Ferlay *et al*, 2013) The situation is therefore concerning for breast, cervical and colorectal cancers for which a screening test exists.

In France nationwide organized screening programs are implemented for breast and colorectal cancer. Cervical cancer screening is based on individual practice but organized screening programs are tested at a local level. Determinants of cancer screening have been documented in mainland France (Sicsic and Franc, 2014) but we lack information in the FWI, where the situation may differ due to differences in health care and socioeconomic characteristics. The objective of this analysis was to investigate the socioeconomic and health care use related determinants of self-reported participation in breast, cervical and colorectal cancer screening among people living in the FWI.

Data and methods

We used data from a cross-sectional national health survey conducted in the FWI in 2014. In total, 2,028 subjects were interviewed in Guadeloupe and 2,026 in Martinique. The socioeconomic and health care use related variables of interest are presented in the tables. All analyses accounted for the sample weights. In model 1 we investigated the association between participation in cancer screening and each variable of interest separately with adjustment for confounding variables ($p<0.20$). The confounding variables are listed in the footnotes of the tables. Model 2 included all variables of interest that were associated with participation in cancer screening in model 1 ($p<0.20$). For cervical cancer screening, stratified analyses by place of residence were conducted, as organised screening program is available in Martinique since 1991 but not in Guadeloupe. Missing data on

categorical confounding variables and variables of interest were imputed with multiple imputation by chained equations under fully conditional specification and assuming missing at random.

Results

In all, 78.1% of the women were up to date with their cervical cancer screening (Table 1). Higher participation was reported among women with qualified occupation and having visited the GP during the last year and lower participation among women who never worked. The results in Martinique were close to those observed among all women, whereas in Guadeloupe having visited the GP during the last year was the only variable associated with participation in cancer screening.

In all, 81.5% of the women were up to date with their breast cancer screening, and 59.5% of the women and 50.8% of the men were up to date with their colorectal cancer screening (Table 2). For both cancer sites, higher screening participation was reported among people having hot water at home and having visited the GP during the last year. Unexpectedly, a lower participation in colorectal cancer screening was found among women with qualified occupation.

Discussion

Our analysis was based on one of the first health surveys conducted in the FWI. The response rate was satisfactory (54.1% in Martinique and 47.9% in Guadeloupe). To correct for non-response bias, sample weights were used. However, selection bias cannot be ruled out and some populations, especially the most deprived, are likely to be under-represented. In addition, self-reported data for participation in cancer screening are thought to overestimate actual use especially for cervical cancer. Nevertheless the accuracy of self-reporting does not seem to be associated with socioeconomic factors (Howard *et al*, 2009) and population-based surveys with questionnaires could be considered valid to assess factors associated with participation in cancer screening.

A survey using the same methodology as ours was conducted in mainland France in 2010 and reported the following participation rates in cancer screening: 45% for men and 44% for women for colorectal cancer, 85% for cervical cancer and 82% for breast cancer. We observed similar rates for breast cancer, lower rates for cervical cancer and higher rates for colorectal cancer. The screening rates observed in our population survey are higher than those estimated from administrative sources as usually reported. However, the comparison of participation in cancer screening between mainland France and the FWI based on administrative data lead to similar conclusions for breast (nationwide screening: 52% in mainland France, 51% in Guadeloupe and 54% in Martinique) and cervical cancer

(57%, 46%, and 53% respectively), but not for colorectal cancer (men: 31%, 24% and 22%; women: 36%, 40% and 34% respectively).(Haute Autorité de Santé, 2010; 2011; Jezewski-Serra and Salines, 2013)

In the literature fewer socioeconomic factors are associated with cancer screening when an organized program exists.(Walsh *et al*, 2011) Consistently, we observed that few factors were associated with self-reported breast and colorectal cancer screening. On the other hand, although organized screening is implemented in Martinique since 1991, fewer associations were observed in Guadeloupe. The participation in organized screening in Martinique is low, though, with only one fourth of all Pap tests performed within the organized screening program.(Haute Autorité de Santé, 2010)

There is no clear result regarding the association between gender and colorectal cancer screening in the literature.(Wools *et al*, 2016) We found higher participation among women, as observed in another survey conducted in the FWI (Michel *et al*, 2013) but not in studies conducted in mainland France.(Fon Sing *et al*, 2013; Sicsic and Franc, 2014) Consistently with other French studies (Fon Sing *et al*, 2013; Michel *et al*, 2013; Sicsic and Franc, 2014) but contrary to the international literature,(Wools *et al*, 2016) we did not observe higher colorectal cancer screening rates among people with a higher socioeconomic status.

Having visited the GP during the last year was strongly associated with participation in cancer screening. The GP is actively involved in the colorectal cancer screening process as he/she provides the patient with the test kit. Although the implementation of colorectal cancer screening differs by country, other studies found that GPs were the most relevant actors in the prescription of colorectal cancer.(Federici *et al*, 2006) It has also been suggested that GPs played an advisory role in participation in breast cancer screening.(Jensen *et al*, 2012) Finally, we used an extreme categorization (no visit to the GP during the year) and we cannot rule out that other characteristics of this highly selected population account for our findings.

The presence of hot water at home was associated with participation in cancer screening for the three cancers investigated. Having hot water is strongly linked with the household's income in the FWI and therefore can be viewed as a surrogate for income, which may suffer from less misclassification or misreporting than usually described for income.(Turrell, 2000) Our results highlight the importance to account for local specificities in this geographical area. Households without hot water account for about 35% of the population living in Martinique and Guadeloupe.

In conclusion, we observed social inequalities in participation in cancer screening in the FWI, which stresses the need to continue efforts to increase screening rates in this population.

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Table 1: Screening rates, odds ratios (ORs) and 95% confidence intervals (CIs) for having had a Pap smear during the past 3 years for women aged 25 to 65 years by socioeconomic and health care use characteristics, French West Indies 2014

	French West Indies (N*=1618)				Martinique (N*=809)				Guadeloupe (N*=809)			
			Model 1	Model 2			Model 1	Model 2			Model 1	Model 2
	N*	Rate	OR [95% CI]	OR [95% CI]	N*	Rate	OR [95% CI]	OR [95% CI]	N*	Rate	OR [95% CI]	OR [95% CI]
Hot water			p=0,006	p=0,09			p=0,01	p=0,05			p=0,2	p=0,4
No	441	71,3	1	1	227	70,1	1	1	214	72,5	1	1
Yes	1177	80,6	1.45 [1.11;1.90]	1.28 [0.96;1.69]	581	80	1.62 [1.11;2.35]	1.50 [1.01;2.24]	595	81,2	1.30 [0.87;1.94]	1.18 [0.78;1.78]
Income support during the last year			p=0,07	p=0,61			p=0,17	p=0,76			p=0,5	
No	1158	79,5	1	1	566	78,9	1	1	591	80,1	1	
Yes	450	74,4	0.77 [0.58;1.02]	0.92 [0.68;1.26]	238	73,4	0.75 [0.50;1.13]	1.07 [0.68;1.68]	212	75,6	0.87 [0.57;1.33]	
Occupational class			p<0,001	p=0,005			p<0,001	p=0,006			p=0,1	p=0,2
Inactive	87	58,4	0.49 [0.30;0.80]	0.56 [0.34;0.92]	47	53,4	0.35 [0.18;0.68]	0.40 [0.20;0.81]	40	64,3	0.57 [0.27;1.21]	0.61 [0.29;1.32]
Qualified	537	84,2	1.47 [1.10;1.97]	1.38 [1.01;1.88]	279	85,2	1.68 [1.10;2.55]	1.45 [0.93;2.29]	259	83,2	1.31 [0.86;1.98]	1.30 [0.85;1.97]
Not qualified	990	76,5	1	1	483	75	1	1	508	77,9	1	1
Education			p=0,03	p=0,58			p=0,004	p=0,16			p=0,8	
No diploma	344	69,4			149	64,2	1	1	194	73,5	1	
<High school	589	77,1	1.31 [0.95;1.80]	1.15 [0.83;1.60]	317	76	1.55 [0.98;2.45]	1.33 [0.82;2.14]	272	78,3	1.15 [0.72;1.84]	
>= High school	674	83,4	1.61 [1.14;2.28]	1.22 [0.83;1.78]	339	84,2	2.40 [1.44;4,00]	1.74 [0.98;3.06]	335	82,6	1.16 [0.71;1.91]	
Health insurance			p=0,07	p=0,14			p=0,29				p=0,1	p=0,2
No	143	70,5	1	1	67	71,9	1		76	69,2	1	1
Yes	1474	78,8	1.44 [0.97;2.15]	1.36 [0.90;2.04]	742	77,7	1.38 [0.76;2.52]		732	79,9	1.52 [0.87;2.64]	1.42 [0.81;2.50]
Renouncement to health care			p=0,29				p=0,67				p=0,3	
No	748	80,4	1		367	78,5	1		381	82,3	1	
For financial and non-financial reasons	282	72	0.75 [0.53;1.06]		160	73,8	0.94 [0.58;1.52]		123	69,6	0.61 [0.36;1.02]	
For financial reasons only	319	79	1.02 [0.73;1.43]		145	79,8	1.24 [0.75;2.04]		174	78,3	0.86 [0.53;1.39]	
For non-financial reasons only	263	76,9	0.83 [0.58;1.18]		134	75,2	0.86 [0.53;1.42]		129	78,8	0.80 [0.47;1.35]	
Visit to GP during the last year			p<0,001	p<0,001			p<0,001	p<0,001			p=0,03	p=0,04
No	104	64,3	1	1	49	58,2	1	1	55	69,8	1	1
Yes	1514	79	2.60 [1.66;4.07]	2.59 [1.65;4.08]	760	78,5	3.59 [1.89;6.82]	3.92 [2.00;7.68]	754	79,6	2.04 [1.06;3.93]	1.99 [1.03;3.85]

* Among complete case data

Model 1: adjusted for age (in 10-year age group), department of residence (Guadeloupe/Martinique), and confounding variables. The variables of interest are adjusted independently.

Model 2: Model 1 + variables with p<0.20 in Model 1

confounding variables :

FWI : being up to date with the vaccinations (yes/no), body mass index (underweight/normal/overweight/obese), place of birth (French overseas territories/mainland France/other), mental health (MH-5 score above/below 56), self-reported health (very good/good/fairly good/bad or very bad), living with a partner (yes/no), smoking status (current/ex/never smoker)

Martinique : being up to date with the vaccinations (yes/no), body mass index (underweight/normal/overweight/obese), alcohol consumption during the last week (yes/no), place of birth (French overseas territories/mainland France/other), suffering from a chronic disease (yes/no), mental health (MH-5 score above/below 56), self-reported health (very good/good/fairly good/bad or very bad), living with a partner (yes/no), smoking status (current/ex/never smoker)

Guadeloupe : being up to date with the vaccinations (yes/no), alcohol consumption, body mass index (underweight/normal/overweight/obese), place of birth (French overseas territories/mainland France/other), mental health (MH-5 score above/below 56), self-reported health (very good/good/fairly good/bad or very bad), living with a partner (yes/no)

Table 2: Screening rates, odds ratios (ORs) and 95% confidence intervals (CIs) for having had a mammogram or a fecal occult blood test during the past 2 years for men and women aged 50 to 74 years by socioeconomic and health care use characteristics, French West Indies 2014

	Breast cancer screening (N*=837)				Colorectal cancer screening men (N*=724)				Colorectal cancer screening women (N*=805)			
			Model 1	Model 2			Model 1	Model 2			Model 1	Model 2
	N*	Rate	OR [95% CI]	OR [95% CI]	**N***	Rate	OR [95% CI]	OR [95% CI]	**N***	Rate	OR [95% CI]	OR [95% CI]
Hot water			p=0,002	p=0,01			p=0,02	p=0,04			p=0,003	p=0,001
No	205	72,6	1	1	225	40,2	1	1	199	50	1	1
Yes	631	84,3	1.89 [1.26;2.84]	1.74 [1.14;2.68]	497	55,6	1.52 [1.06;2.19]	1.47 [1.01;2.13]	605	62,6	1.68 [1.20;2.36]	1.81 [1.27;2.57]
Income support during the last year			p=0,02	p=0,09			p=0,55				p=0,25	
No	714	82,9	1	1	624	52,5	1		684	61	1	
Yes	116	72,5	0.55 [0.34;0.91]	0.63 [0.37;1.07]	96	39,4	0.86 [0.53;1.40]		114	50,7	0.78 [0.52;1.19]	
Occupational class			p=0,68				p=0,68				p=0,03	p=0,02
Inactive	24	74,5	0.64 [0.24;1.73]		6	45,7	1.17 [0.20;6.92]		26	43,8	0.42 [0.18;0.96]	0.52 [0.22;1.22]
Qualified	239	80,4	0.99 [0.65;1.50]		278	55	1.16 [0.83;1.62]		226	52,7	0.72 [0.51;1.01]	0.65 [0.46;0.92]
Not qualified	572	82,2	1		439	48,2	1		551	63	1	1
Education			p=0,82				p=0,98				p=0,98	
No diploma	276	80,2	1		239	47,7	1		270	62,5	1	
<High school	351	83,7	1.12 [0.72;1.73]		343	52,1	1.04 [0.72;1.50]		336	59,7	0.97 [0.69;1.38]	
>= High school	199	79,2	0.97 [0.58;1.63]		137	52,9	1.00 [0.63;1.61]		187	54,8	0.97 [0.64;1.47]	
Health insurance			p=0,92				p=0,04	p=0,09			p=0,21	
No	74	80,4	1		114	38,7	1	1	72	65,8	1	
Yes	763	81,6	0.97 [0.52;1.82]		609	53	1.61 [1.03;2.51]	1.49 [0.94;2.37]	733	58,9	0.71 [0.42;1.21]	
Renouncement to health care			p=0,48				p=0,3				p=0,27	
No	446	82,9	1		442	54	1		429	63,9	1	
For financial and non-financial reasons	112	79,8	0.85 [0.48;1.50]		91	45,2	0.93 [0.56;1.52]		107	50,8	0.72 [0.46;1.12]	
For financial reasons only	148	82,2	0.93 [0.56;1.57]		112	50,1	0.90 [0.57;1.41]		141	58,6	0.90 [0.60;1.34]	
For non-financial reasons only	124	77	0.67 [0.40;1.11]		77	39,9	0.60 [0.35;1.02]		121	52,6	0.70 [0.46;1.07]	
Visit to the GP during the last year			p<0.001	p<0.001			p<0.001	p<0.001			p<0.001	p<0.001
No	38	42	1	1	83	15,9	1	1	36	23,5	1	1
Yes	800	83,3	5.65 [2.73;11.67]	5.91 [2.84;12.30]	640	55,3	4.77 [2.54;8.96]	4.53 [2.40;8.56]	769	61,2	4.76 [2.11;10.76]	4.51 [2.00;10.19]

Model 1: adjusted for age (in 5-year age group), department of residence (Guadeloupe/Martinique), and confounding variables. The variables of interest are adjusted independently.
Model 2: Model 1 + variables with p<0.20 in Model 1
* Among complete case data
confounding variables :
Mammography: being up to date with the vaccinations (yes/no), place of birth (French overseas territories/mainland France/other), suffering from a chronic disease (yes/no), self-reported health (very good/good/fairly good/bad or very bad), living with a partner (yes/no), smoking status (current/ex/never smoker)
Colorectal cancer men: being up to date with the vaccinations (yes/no), place of birth (French overseas territories/mainland France/other), self-reported health (very good/good/fairly good/bad or very bad), living with a partner (yes/no)
Colorectal cancer women: place of birth (French overseas territories/mainland France/other), smoking status (current/ex/never smoker)