

## ORIGINAL ARTICLE

# Cervical cancer screening in the Ferrara Local Health Authority catchment area

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## Key words

Evaluation • Cervical cancer • Screening

## Summary

Since 1996, the Emilia-Romagna Region has been promoting screening programmes for cervical cancer, selecting resident women aged 25-64 as a target population. This analysis concerns a second round of screening performed in the city of Ferrara and its province. A total of 103,971 women were invited to be screened, but only 55.51% of them arrived on the day of the scheduled screening. We therefore decided to investigate the reasons for this lack of participation using preliminary findings from the local screening program registry. These indicated that non-attendance was related to variables such as area of residence and age, and significant differences were observed between localities, with a consistently greater participation in industrial neighbourhoods and their surroundings than in rural areas. In order to elucidate these observations further, a cross-sectional survey, placing special emphasis on setting, area of

residence, age and level of education, was performed by structured telephone questionnaire, in order to identify the reasons behind non-attendance. Approximately 94% of the contacted women agreed to be interviewed, thereby demonstrating that a telephone interview is a valid means of collecting data in such cases. It should be noted that, among the women unwilling to respond to the questionnaire, a marked increase in percentage was observed for those resident in rural areas, of whom approximately 50% fell into the under-40 age group. The results of the survey indicated, as demonstrated by several previous studies, that age and the area of residence are both determining factors in the decision or not to participate in a screening programme. It was also observed that women who had completed the lower and upper secondary school education were shown to pay greater attention to health matters than those who had not.

## Introduction

Although cervical cancer is the second most common cancer amongst women worldwide, with significantly higher rates in developing areas like Africa, the Caribbean and Latin America [1, 2], various studies have revealed that cervical cancer (CC) screening significantly reduces both CC incidence and mortality in developed countries. The Papanicolaou smear (Pap-test), which can detect abnormalities in cells and precancerous lesions in the cervix at an early stage, is an effective preventive measure in reducing cervical cancer incidence and mortality [3] and, according to international guidelines, should be carried out once every 3-5 years in all women aged 25-64 [4]. In developed countries, even if the Pap-test is considered an efficacious screening tool, disparities are known to persist in the utilization of this procedure across socio-economic groups, so the success of cervical screening initiatives depends on high participation of the target population [5]. Most cited reasons for non-attendance in this group were reluctance to undergo medical examination in the absence of symptoms and fear of undergoing a test designed to detect cancer. Therefore, whether a woman will or will not go on to develop cervical cancer in developed countries depends on a complex number of interacting variables such as

the women's perception, health orientation and other socio-cultural issues [6].

In Italy, screening programmes are required to be carried out in all health districts according to guidelines laid out by the Italian Ministry of Health [7]. However, there are several indicators suggesting that the total coverage of the population varies from area to area and that, even when a programme is successful at contacting the entire target population, compliance varies from 20% to 60%, with a mean of 39% [8, 9]. Since 1996, the Emilia-Romagna Region has been promoting screening programmes for cervical cancer, selecting all women aged 25-64 resident in the region as the target population for invitation to screening on a three-yearly basis (round) [10]. The Local Health Authority of Ferrara also set up its screening programme at this time. This analysis concerns the second round of screening, carried out between 1999 and 2002, and is aimed at estimating Pap-test coverage both in the city and province of Ferrara, and identifying the reasons for non-attendance at the screening. The present paper illustrates the preliminary findings of the study, which placed special emphasis on setting, area of residence, age and level of education of the population studied. Data concerning the specific reasons behind the decision to attend the screening or not will be the subject of a further article.

## Materials and Methods

### THE SETTING

Ferrara, a small, historical town of 130,000 inhabitants, is situated in the north-east of the Emilia-Romagna region in Italy. Its province is characterized by a prevalently agricultural economy and has few industrial centres, mostly situated in Ferrara and in the municipalities of Copparo and Cento. A large percentage of the working population commutes daily to the nearby provinces of Bologna and Modena. This situation determines a variable mix of urban and rural populations, with an average income of approximately 18,780 € per year (medium-low compared with the regional level). Although the territory of Ferrara Local Health Authority was divided into five districts (Cento, Codigoro, Copparo, Ferrara and Portomaggiore) during the considered period, it was decided, in the interests of clarity, to use the present division of three districts:

- *The Central-Northern District* comprises the following municipalities: Berra, Copparo, Ferrara, Formignana, Jolanda di Savoia, Masi Torello, Ro Ferrarese, Tresigallo and Voghiera;
- *The South-Eastern District* is made up of the following municipalities: Argenta, Codigoro, Comacchio, Goro, Lagosanto, Massa Fiscaglia, Mesola, Migliarino, Migliaro, Ostellato and Portomaggiore;
- *The Western District* is divided into the following municipalities: Bondeno, Cento, Mirabello, Poggio Renatico, S. Agostino and Vigarano Mainarda.

### THE STUDY

This study integrates data from the local screening program registry with those documented during a cross-sectional survey. The data from the screening program registry were provided by the Ferrara Local Health Authority Screening Centre and refer to the second round of screening carried out from the 1<sup>st</sup> of October 1999 to the 30<sup>th</sup> of September 2002. The data mainly concerned participation in the programme, residential area and the age of the eligible population. Other information of interest, such as level of education, was not provided in all cases and could therefore not be exploited. For this reason, a cross-sectional survey based on a structured questionnaire and designed on the basis of feedback received from several focus-group discussions was employed to investigate the reasons behind non-attendance of the screening [11-14].

### THE QUESTIONNAIRE

The questionnaire contained 12 questions and was divided into three sections. The first section was aimed at all interviewees, while the second and third sections concerned women taking part in the health authority programme and those who attended other centres or decided not to undergo the Pap-test, respectively. The questionnaire included the following subsections: personal information; history of hysterectomy; family history of cancer; screening history; reasons for non-

compliance with the screening programme and satisfaction with the service received. The first question asked the interviewees was whether the letter of invitation had been received or not. If the letter had not been received the interview was terminated, as the basic supposition for further questioning was absent. The subsequent questions in the first section were designed to discover the degree of awareness of the problem and the role of the Pap-test through:

- a) Determining the women's understanding of the importance of the Pap-test, and what they considered its purpose to be;
- b) Encouraging them to seek further information about it;
- c) Discovering the source of any information obtained;
- d) Ascertaining the frequency of the Pap-tests carried out and the reasons behind the attitude adopted;
- e) Verifying the women's participation or not in other screening programmes.

The second and third sections of the questionnaire were designed to discover whether the women intended to participate in the Local Authority programme, or if they intended to exploit other public health centres or private specialists, and whether or not they were reluctant to have the test done.

At the end of the questionnaire the women were asked about their educational qualifications, since it has frequently been held that the level of education may influence participation in the screening programme. The phone questionnaire took about 15 minutes, and was conducted by three trained interviewers.

### DATA ANALYSIS

With regard to the data provided by the "Women's Health Centre", participation in the programme was related to residence and age and, in order to assess the importance of the differences between participation percentages, the chi-square test was used. The responses from each questionnaire were recorded in a database using Microsoft Access version Office 2000, the tables and figures were created using Microsoft Excel version Office 2000, and the statistics processed using the online version of SSP. The score for the relationship between age categories and the different municipalities of the province (from 8+ to 8-) was calculated considering the performance of each municipality in the eight age categories and the relative scale of values was drawn up.

### ETHICS AND PRIVACY

The interviews were performed by a standardised procedure licensed by the local Local Health Authority Committee of Ethics, and the interview was thus conducted with the following information sequence:

- Identification of and statement of credentials of the caller;
- Identification of the centre from which the call was made;
- Provision of free-phone number to check the propriety of the call;

Tab. I. Participation by councils and districts.					
	Participating		Not Participating		Totals
	No.	%	No.	%	No.
Berra	930	55.82	736	44.18	1.666
Copparo	3.108	56.81	2.363	43.19	5.471
Ferrara	22.710	55.87	17.937	44.13	40.647
Formignana	419	50.42	412	49.58	831
Jolanda di Savoia	557	54.34	468	45.66	1.025
Masi Torello	408	57.38	303	42.62	711
Ro Ferrarese	556	48.10	600	51.90	1.156
Voghiera	733	62.92	432	37.08	1.165
Tresigallo	816	57.14	612	42.86	1.428
<b>CENTRE-NORTH DISTRICT *</b>	<b>30.237</b>	<b>55.89</b>	<b>23.863</b>	<b>44.11</b>	<b>54.100</b>
Bondeno	2.354	51.78	2.192	48.22	4.546
Cento	5.091	59.41	3.478	40.59	8.569
Mirabello	494	49.75	499	50.25	993
Poggio Renatico	1.177	52.90	1.048	47.10	2.225
S. Agostino	1.058	59.94	707	40.06	1.765
Vigarano Mainarda	1.010	51.30	959	48.70	1.969
<b>WEST DISTRICT **</b>	<b>11.184</b>	<b>55.73</b>	<b>8.883</b>	<b>44.27</b>	<b>20.067</b>
Argenta	3.293	53.04	2.916	46.96	6.209
Codigoro	2.426	61.84	1.497	38.16	3.923
Comacchio	3.058	46.89	3.464	53.11	6.522
Lagosanto	740	57.19	554	42.81	1.294
Massa Fiscaglia	619	56.07	485	43.93	1.104
Mesola	1.214	55.36	979	44.64	2.193
Migliarino	615	55.76	488	44.24	1.103
Ostellato	1.202	57.10	903	42.90	2.105
Portomaggiore	2.163	62.95	1.273	37.05	3.436
Goro	590	47.16	661	52.84	1.251
Migliaro	375	56.48	289	43.52	664
<b>SOUTH-EAST DISTRICT ***</b>	<b>16.295</b>	<b>54.67</b>	<b>13.509</b>	<b>45.33</b>	<b>29.804</b>
<b>A.U.S.L. FERRARA</b>	<b>57.716</b>	<b>55.51</b>	<b>46.255</b>	<b>44.49</b>	<b>103.971</b>

p = 0,0023 \* rural (except Ferrara) \*\* industry \*\*\* agriculture, tourism, fishing

- Statement of the reason for calling with reference to the screening programme;
- Request for interview;
- Execution of interview.

The individual questionnaires were anonymous and recorded by an identification number only.

## Results

### COMPLIANCE WITH SCREENING INVITATION

At the beginning of the second round of screening, the target population in the province of Ferrara was 113,690 women. This population was divided into the following

five-year age categories: 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, and 60-64. Of these, 9,719 women were excluded as they were found to be:

- already excluded in the 1 <sup>st</sup> round	1,969
- untraceable	7
- emigrated	5,638
- unknown	9
- deceased	1,269
- inexistent	4
- hysterectomised	461
- resident in other Health Auth.	2
- identification errors	323

For these reasons, the eligible population actually involved in the screening was 103,971 women. Participation

in province of Ferrara was 55.51% (57,716 women), compared to 50.4% participation in the same round of screening in the Emilia-Romagna region [7]. The remaining 44.49 % (46,255 women) had not felt it necessary to take up the Health Authority's invitation. The analysis of distribution at the district level reported in table I shows that the percentage of participation is statistically very different ( $p = 0.0023$ ) between the three different districts. In the Central-Northern District, characterised by a prevalence of rural populations and a large percentage of people commuting to the city of Ferrara, there was a wide variety of participation among women living in various municipal areas, with the lowest percentage (48.10%) in Ro Ferrarese and the highest (62.92%) in Voghiera. Both of these figures are statistically significant, as confirmed by the chi-square test ( $p < 0.0001$ ) calculated by comparing the above municipalities with the district they belong to. In the Western District, characterised by a large percentage of the population working in local industry, there was less difference among the individual councils, with a maximum of 59.94% in S. Agostino and a minimum of 49.75% in Mirabello; these differences were also statistically significant ( $p < 0.0001$ ). Finally, in the South-Eastern District, characterised by a mixed population working in agriculture, tourism and the fishing industry, the lowest percentage of participation was found in Comacchio (46.89%) and the highest in Portomaggiore (62.95%). Similar to the abovementioned cases, as compared with the district,  $p < 0.0001$  was observed in both municipalities.

The second variable analysed was the age related to participation. Distribution by 5-year categories of the eligible population (Tab. II) showed that participation was: a) greater among women aged 50-59 (participation > 60%), b) consistent among those aged 35-49 and in the over 60s (on average 56%) and c) lowest among those aged 25-34 (participation < 52%). The lowest level overall was found between 25-29 years of age (46.02 %). The differences in this latter age bracket were compared to the various age groups, as a whole and singly, with the total eligible population ( $p < 0.0001$ ). Table 3 shows the relationship between the age categories and the 26 muni-

cipalities of the province; each of these was denoted "+" or "-" according to how the percentage of participation in that age category compared with the provincial average. From this analysis a consistently greater participation (8+) than in the province in all categories emerges for Cento and Voghiera, whose populations mostly work in the high value-added industry, whereas the opposite result (8-) was observed for Bondeno, Comacchio, Goro and Ro, whose population are mainly rural.

As demonstrated by several previous studies, these findings suggest the possibility that the age [15, 16] and the area of residence [17-20] are both determining factors for the individual participation.

#### THE QUESTIONNAIRE

This study was carried out before the 30<sup>th</sup> of September 2005 (the final date of the 3<sup>rd</sup> round), using the contact list provided on a monthly basis by the Women's Health Centre of the Local Health Authority, which contained the appointment dates, phone numbers and personal information.

A total of 1,206 women (Tab. IV) were contacted, of whom 1,132 (93.86%) confirmed that they had received the invitation to visit the screening clinic and were willing to respond to the questionnaire. 32 (2.65% - described as interviewees without invitation) of the initial 1,206 women said they had not received an invitation and the interview was not continued due to the absence of the basic premise for further questioning. The remaining 74 women (6.14%) refused the request for interview. Table V shows the division of the women contacted into 5-year age groups into those who agreed to be interviewed and those who did not. This latter category contained very few women under 30 years old, a much higher percentage of women aged between 30 and 45 years (18.08% - 22.06% - 14.18%) and a substantial number of over 55s (11.11% and 15.42%). Regarding the few women who were not willing to be interviewed, approximately 50% were found in the under-40 age group, seeming to suggest that younger women are more reluctant to raise their awareness of cervical cancer.

Tab. II. Distribution by age classes.

Age	Totals	Participating		Non Participating	
		No.	%	No.	%
25-29	12.693	5.841	46.02	6.852	53.98
30-34	13.299	6.787	51.03	6.512	48.97
35-39	13.514	7.410	54.83	6.104	45.17
40-44	12.822	7.238	56.45	5.584	43.55
45-49	12.230	7.035	57.52	5.195	42.48
50-54	13.340	8.076	60.54	5.264	39.46
55-59	12.526	7.624	60.87	4.902	39.13
60-64	13.547	7.705	56.88	5.842	43.12
<b>Total</b>	<b>103.971</b>	<b>57.716</b>	<b>55.51</b>	<b>46.255</b>	<b>44.49</b>

$p < 0.0001$

**Tab. III.** Participation by councils and age classes.

Council	Age								Score	Classification	Score
	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64			
ARGENTA	-	-	-	-	+	-	-	-	-6	CENTO	+8
BERRA	-	+	+	+	-	-	+	+	+2	VOGHIERA	+8
BONDENO	-	-	-	-	-	-	-	-	-8	CODIGORO	+6
CENTO	+	+	+	+	+	+	+	+	+8	SANT'AGOSTINO	+6
CODIGORO	+	+	+	+	+	+	+	-	+6	LAGOSANTO	+4
COMACCHIO	-	-	-	-	-	-	-	-	-8	MASI TORELLO	+4
COPPARO	-	-	+	+	-	+	+	+	+2	MIGLIARO	+4
FERRARA	-	-	-	-	-	+	+	+	-2	OSTELLATO	+4
FORMIGNANA	-	-	-	-	+	+	+	-	-2	PORTOMAGGIORE	+4
goro	-	-	-	-	-	-	-	-	-8	BERRA	+2
JOLANDA	+	-	-	-	+	-	+	-	-2	COPPARO	+2
LAGOSANTO	+	+	+	+	+	+	-	-	+4	MIGLIARINO	+2
MASI TORELLO	+	+	-	+	+	+	-	+	+4	TRESIGALLO	+2
MASSA FISCAGLIA	+	+	+	-	+	-	-	-	0	MASSA FISCAGLIA	0
MESOLA	-	+	+	+	+	-	-	-	0	MESOLA	0
MIGLIARINO	+	-	+	+	+	+	-	-	+2	POGGIO RENATICO	0
MIGLIARO	+	+	+	+	+	+	-	-	+4	FERRARA	-2
MIRABELLO	-	-	-	-	-	-	-	+	-6	FORMIGNANA	-2
OSTELLATO	+	+	+	+	+	-	+	-	+4	JOLANDA	-2
POGGIO RENATICO	-	-	-	+	-	+	+	+	0	VIGARANO M	-4
PORTOMAGGIORE	+	+	+	+	+	+	-	-	+4	ARGENTA	-6
RO	-	-	-	-	-	-	-	-	-8	MIRABELLO	-6
SANT'AGOSTINO	+	+	+	+	-	+	+	+	+6	BONDENO	-8
TRESIGALLO	+	-	+	+	-	+	+	-	+2	COMACCHIO	-8
VIGARANO M	+	-	-	-	-	-	+	-	-4	GORO	-8
VOGHIERA	+	+	+	+	+	+	+	+	+8	RO	-8

The area of residence was also a significant feature in analysis of the sample. The results are shown in Table VI and Figure 1, from which it appears that the highest percentage of participating women live in the Central-Northern District (58.75%), while the figure progressively decreases in the South-Eastern and Western Districts (from 27.65% to 13.60%). It should be noted, however, that the percentages of women who were unwilling to respond to the questionnaire show a marked increase in the outer districts of the Province as compared with the provincial capital. This response should be taken as a further sign of the greater atten-

tion paid to health problems by women living in an urban setting.

A further feature concerns the level of education, as described in Figure 2 which shows the following findings: 197 of the women interviewed (17.91%) had completed a primary school level of education, the majority of the interviewed women had received a lower secondary school (N. 374, 34.00%) or upper secondary school education (N. 371, 33.73%) while 145 women (13.18%) had a university degree and 13 women (1.18%) had failed to complete their compulsory education period.

**Tab. IV.** Receiving of invitation of women contacted by phone.

	Totals		Invitation received		Invitation not received	
	No.	%	No.	%	No.	%
Interested in interview	1132	93.86	1100	91.21	32	2.65
Not interested in interview	74	6.14				
Totals	1206	100				

Fig. 1. Graphic illustration of distribution by Districts of the sample of 1206 women contacted by phone.

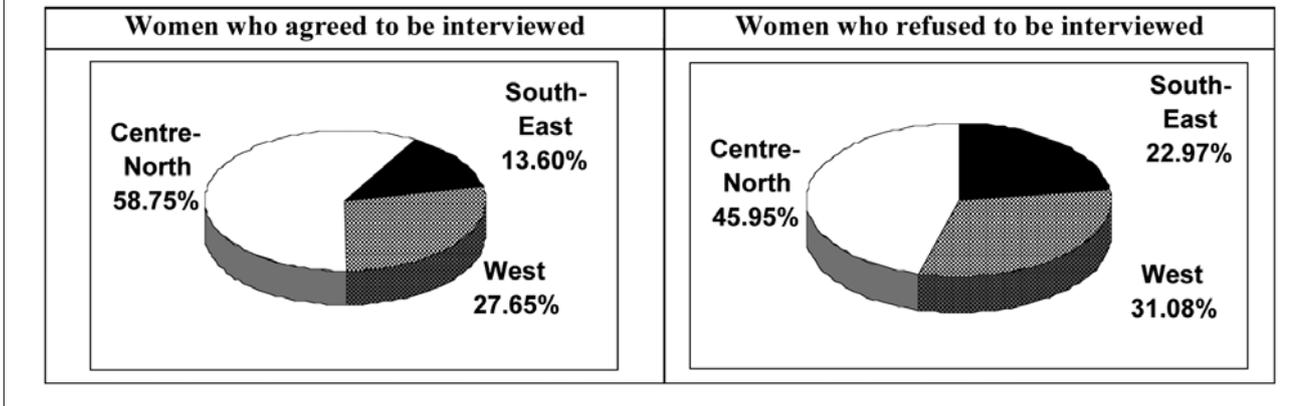
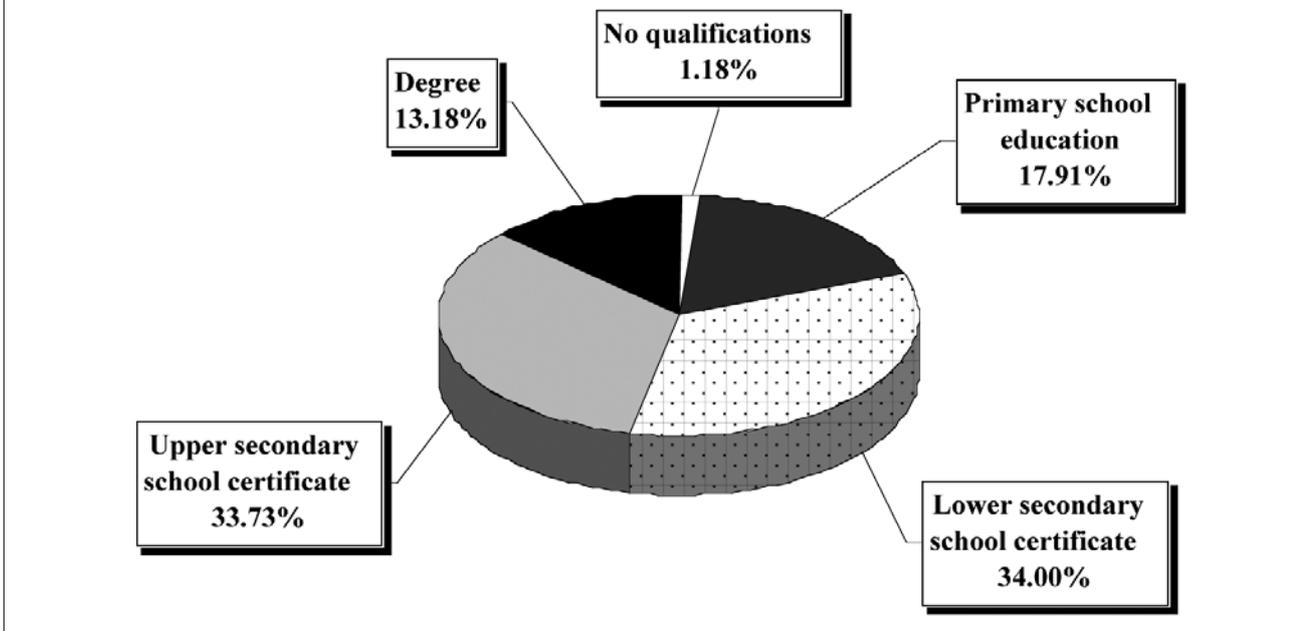


Fig. 2. Educational qualifications of the 1100 women interviewed.



## Discussion

In Italy, according to guidelines set out for the Emilia-Romagna region, the Ferrara Local Health Authority (AUSL Ferrara) completed the second round of their screening programme to prevent cervical cancer on the 30<sup>th</sup> of September 2002. Participation throughout the area was 55.51% (57,716 women out of 103,971). The remaining 44.49% (46,255 women) did not take up the Health Authority's invitation. In order to put this finding in context, it should be remembered that participation in the same round of screening throughout Emilia-Romagna was 50.4% [10].

Although overall participation in Ferrara was higher than at the regional level, distribution among the three districts ( $p = 0.0023$ ) and among the different age groups resulted to be inconsistent. The territorial distribution analysis (Tab. I) shows that the percentage

of participation was statistically very different between Districts, which may be explained by the disparities in the use of health services between urban and rural populations [18-20]. Indeed the cultural makeup of the female population, as well as women's habits and behaviour, all seem to be important factors [17]. In fact, the lowest percentage of participation was found in the rural settings of the municipalities of Comacchio (46.89%) and Goro (47.16%), which are the farthest from the provincial capital while, in contrast, the highest percentage in participation was registered in Voghiera (62.92%), where a large percentage of the female population is employed in the tertiary industry in Ferrara. However, if age and area of residence are associated, the results become more difficult to explain. Table III illustrates the relationship between the various age groups and the municipality of residence. From this emerges a consistently greater participation [8+] in all

**Tab. V.** Age groups of the sample of women contacted by phone.

interviewees	Group	25-29 y.		30-34 y.		35-39 y.		40-44 y.		45-49 y.		50-54 y.		55-59 y.		60-65 y.	
		Totals	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Yes	1132	17	1.50	206	18.20	246	21.73	161	14.22	94	8.30	104	9.19	126	11.13	178	15.73
No	74	4	5.41	12	16.22	20	27.03	10	13.51	9	12.16	3	4.05	8	10.81	8	10.81
Totals	1206	21	1.74	218	18.08	266	22.06	171	14.18	103	8.54	107	8.87	134	11.11	186	15.42

**Tab. VI.** Distribution over the Districts of the sample of women contacted by phone.

Districts		Centre-North		West		South-East	
		No.	%	No.	%	No.	%
Interviewed	1132	665	58.75	313	27.65	154	13.60
Not interviewed	74	34	45.95	23	31.08	17	22.97
Totals	1206	699	57.96	336	27.86	171	14.18

categories in the industrial setting of Cento and for the provincial capital neighbourhood of Voghiera than in the province, and the completely opposite result [8-] for the rural localities of Bondeno, Comacchio, Goro and Ro. This indicates that better social-economic conditions in urban and industrial settings can play a greater role in people's evaluation of health requirements and active participation in protecting one's health. This consideration is reinforced by the fact that around 94% of the contacted women agreed to be interviewed, which serves to emphasise the great attention paid by the female population of Ferrara to health matters. With regard to the women who, in the respective age groups, were not willing to be interviewed, approximately 50% were found in the under-40 age group, seeming to suggest that younger women are more reluctant to raise their awareness of health matters. The district of residence analysis of the interviewed women highlights the fact that the highest percentage of participants live in the Central-Northern District (58.75%), while the figure progressively decreases respectively in the South-Eastern District (13.60%) and in the Western District (27.65%). It must be noted, however, that among the women who were unwilling to respond to the questionnaire, such percentages show a marked increase in the outer Districts of the Province compared to that of the provincial capital.

A further aspect of the sample studied concerns the education level, as previously described [21-23]. From Figure 2 it emerged that both lower and upper secondary school education are correlated with a better attitude of the population towards health issues.

## Conclusions

Previous studies have shown that administrative errors, such as incorrect addresses or delivery failure, must be included amongst the factors influencing participation in a screening programme [24-26]. On the basis of the obtained results regarding the compliance of the women interviewed, it can be stated that the use of a telephone questionnaire is a workable procedure in this kind of study [13, 27, 28]. With regard to the factors linked to diversities in the target female population (social-economic class, level of education, income), targeted interventions would most likely contribute to reducing these disparities in the health of women. The psychological aspects studied by the questionnaire, like the perception of one's susceptibility and vulnerability, of the serious nature of the disease, the perception of the difficulties in being involved in screening policies, such as easy access to screening locations or otherwise, the cost, the waiting list, etc., will be the subject of a further paper.

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