

## Campaign against cancer of the uterus in the province of Ferrara: results of 15 years of mass screening

by  
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Since 1962 a Centre for the early diagnosis of cancer of the uterus has been in operation at the Gynaecological Clinic of the University of Ferrara. Its tasks have also included teaching, health education and scientific research.

The physicians and obstetricians of the out-patient departments run by the Social Health societies of the Province collaborate with this Centre in obtaining cytological samples and in making the female population aware of its existence. There are 21 of these out-patient units run by the society at Ferrara-Poggiorenatico alone, with a female population of 64,834; 7 of the units are in the city centre and 14 in the countryside (Fig. 1).

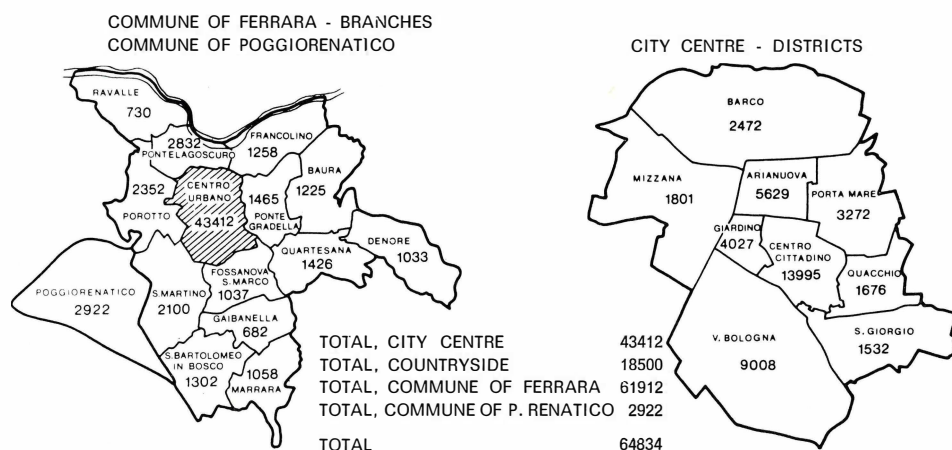


FIG. 1 - Social Health Society of Ferrara - Poggiorenatico.

The material for examination is sent to the cytological laboratory from the Centre. Patients whose cytological results are doubtful or positive are admitted to hospital for further tests (cytological checks, colposcopy, biopsy).

During the period 1st October 1962 - 31st December 1976, 84,903 women were examined, the equivalent of 57% of the female population above the age

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Tab. 1. *Mass screening in the province of Ferrara (October 1962 - December 1976). Number of carcinomas detected at 1st test and in subsequent tests.*

	No. of women	Ca. in situ	Invasive			Total	
1st test	84.903	248	2,92	241	2.80	489	5.70
2nd test	55.034	55	1.00	27	0.50	82	1.50
3rd test	35.061	16	0.45	16	0.45	32	0.90
4th test	25.762	4	0.16	13	0.50	17	0.66
5th test	19.642	5	0.25	1	0.05	6	0.30
6th test	11.515	2	0.17	1	0.09	3	0.26
7th and later tests	33.247	2	0.06	6	0.18	8	0.24
Total	265.164	332	1.25	305	1.15	637	2.40

of 20 for the entire province. Of these 84,903 women, some were examined two or more times, the total number of tests being 265,164. On 31st December 1976, 37,247 women had been checked seven or more times (Table 1).

Fig. 2 shows the number of women who were given periodic tests, and the number calculated on the basis of an exponential function. This function was obtained by the « minimum squares » method applied to the natural logarithm of the number of women examined. An analysis of the data given in the figure shows that, on average, 68% of the women previously seen were present at the subsequent examination. This is a very steady value for more than 10 screenings.

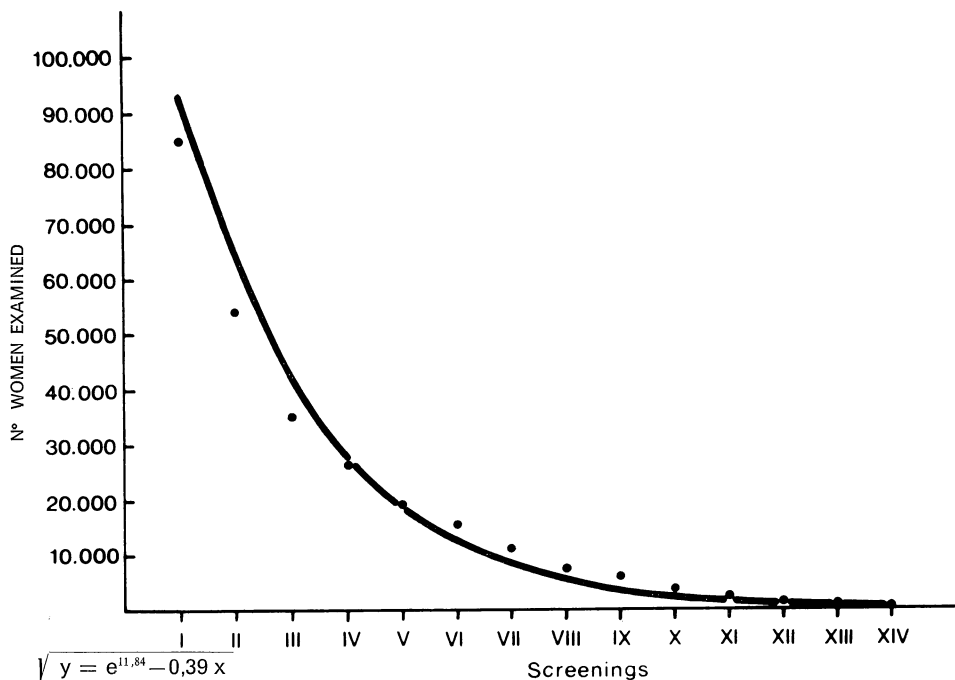


Fig. 2 - Number of women examined in 14 successive screenings (·) and number expected (—) based on an exponential function.

On the basis of Papanicolaou's test, 2,230 women were called to undergo further checking, of whom 94 (4.2%) did not attend. Biopsies were performed on 1,112 women (0.43% of all the women examined).

In aggregate, 637 cancers were detected, subdivided as follows: 332 carcinomas *in situ*, 271 invading the portio cervicis (70 at stage Ia, 138 at stage Ib, 51 at stage II, 9 at stage III, 3 at stage IV), 28 carcinomas of the endometrium, 4 of the ovary, 2 of the vulva (Table 2). In addition 367 cases of dysplasia were found. Among the cervical carcinomas there were 4 mixed tumours (squamous carcinoma + adenocarcinoma).

Tab. 2. *Distribution of carcinomas by site.*

Ca <i>in situ</i> (portio cervicis)	332
Ca invading the portio cervicis	271*
Ca endometrial	28
Ca of ovary	4
Ca of vulva	2

\* of which 70 stage Ia, 138 st. Ib, 51 st. II, 9 st. III, 3 st. IV

Tab. 3. *Mass screening in the province of Ferrara (October 1962 - December 1976). Number of cervical carcinomas detected at 1st and subsequent tests.*

	No. of women	Ca. in situ		Invasive ca.		Total	
1st test	84.903	248	2.92	226	2.66	474	5.58
2nd test	55.034	55	1.00	18	0.33	73	1.32
3rd test	35.061	16	0.45	12	0.34	28	0.79
4th test	25.762	4	0.16	11	0.44	15	0.56
5th test	19.642	5	0.25	1	0.05	6	0.30
6th test	11.515	2	0.17	1	0.08	3	0.26
7th and later tests	33.247	2	0.06	2	0.06	4	0.12
Total	265.164	332	1.25	271	1.02	603	2.27

As can be seen in Table 3, the frequency of the invasive tumour at the first screening was gradually lowered at subsequent screening, being reduced practically to 0 at the fifth test (Fig. 3). This finding, together with the high percentage of the preclinical cancers found (ca. *in situ* + ca. stage Ia) – the prognosis of these, as we know, is extremely favourable – constitutes the most significant index of the efficacy of the campaign.

As regards age-groups, the maximum frequency of the lesion was found between 31 and 35 years for the dysplasias, between 41 and 45 for carcinoma *in situ*, 51-55 for invasive carcinoma. 29 of the carcinomas *in situ* and 4 of the invasive carcinomas were in patients aged between 20 and 30 years (Table 4).

Our results are in agreement with those obtained in other mass detection programmes for cervical carcinoma. In particular, it is interesting to compare them with the programmes carried out in the city of Louisville in Kentucky<sup>(2)</sup> and those in British Columbia<sup>(3)</sup>. Comparison between these three programmes cannot be absolutely exact, since the interval of time between the two successive screening was neither regular within the same programme, nor the same in different programmes. In the province of Ferrara the mean interval was 17 months, in British Columbia it was 12 months and fairly regular, while at Louis-

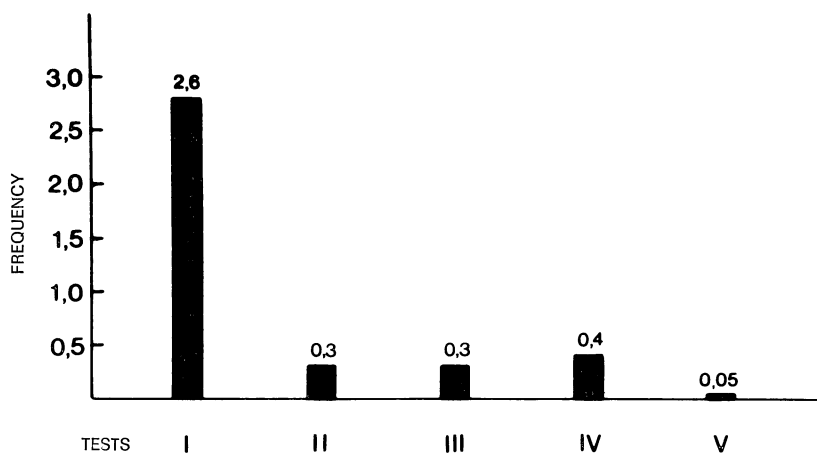


FIG. 3 - Frequency of invasive ca. among 1000 women examined.

Tab. 4. *Distribution by age-groups of dysplasia and ca. of portio cervicis.*

Age	Dysplasia	Ca. <i>in situ</i>	Invasive ca.
< 20	2	—	—
21-25	9	7	—
26-30	48	22	4
31-35	75	40	7
36-40	73	48	33
41-45	68	83	42
46-50	39	48	47
51-55	30	46	54
56-60	14	20	43
61-65	5	11	39
> 66	4	7	26

ville it varied from 1 to 9 years. With this limitation, however, it is possible to proceed to a comparison of the levels of prevalence and incidence to the most indicative screenings, that is, to the 1<sup>st</sup> and 4<sup>th</sup>. We should remember that the prevalence was shown at the 1<sup>st</sup> screening, but at the 4<sup>th</sup> and later screenings the incidence was estimated. As we know, in screening for any disease false negatives are inevitable at the 1<sup>st</sup> screening: these escape the investigation. If the relation between prevalence and incidence is large, and false negatives are present, these will be detected at subsequent screenings, together with the new cases that constitute the incidence. Therefore the incidence will be overestimated at the 2<sup>nd</sup> and 3<sup>rd</sup> screenings, due to the false negatives that have been left over from previous years and have only now been discovered. A reliable incidence is thus one obtained from the 4<sup>th</sup> screening onwards.

The most directly comparable data are those from Ferrara and Louisville, which refer respectively to 265,164 and 127,758 tests (Tables 5, 6). As regards invasive carcinoma, Ferrara showed a level of 2.6‰ at the first screening, against 3.7‰ for Louisville; while at the 4<sup>th</sup> and later screenings, Ferrara had 0.16‰, while Louisville had no cases at all. However, at Ferrara the number of women

Tab. 5. Mass screening in the province of Ferrara (October 1962 - December 1976). Number of cervical carcinomas detected at 1st and subsequent tests.

	no. of women	Ca. in situ		Invasive ca.		Total	
1st test	84.903	248	2.92	226	2.66	474	5.58
2nd test	55.034	55	1.00	18	0.33	73	1.32
3rd test	35.061	16	0.45	12	0.34	28	0.79
4th and later tests	90.166	13	0.14	15	0.16	28	0.30
Total	265.164	332	1.25	271	1.02	603	2.27

Tab. 6. Comparison of rates per 1000 of cervical carcinomas in situ and invasive ca. in two screening programmes.

		Ferrara (1962-1976)	Louisville (1956-1964)
Ca. in situ	1st test	2.92	3.91
	2nd test	1.00	1.65
	3rd test	0.45	1.70
	4th and later tests	0.14	1.02
Invasive Ca.	1st test	2.66	3.07
	2nd test	0.33	0.87
	3rd test	0.34	0.31
	4th and later tests	0.16	0.00

tested at the 4<sup>th</sup> and later screenings was more than ten times greater (90,166 against 8,783) than the number of women detected at Louisville. Thus the estimate for Ferrara seems more reliable than that for Louisville.

As regards carcinoma *in situ*, Ferrara recorded a level of 0.14‰, less than that for Louisville (10.2‰) and the levels reported by other authors: Boyes *et al.*, (0.46‰), Fidler *et al.*, (0.66‰), Kasper (4.58‰), Kashgarian & Dunn (0.35‰ in a white population, 0.56‰ in a coloured population); <sup>(1,2,3,4,5)</sup>.

During the period 1963-1970, in the Ferrara clinic, 315 cases of carcinoma *in situ* were operated upon, and 61 cases of microinvasive carcinoma, resulting mostly from the activities of the Centre. The percentage of survival after 5 years was respectively 97.7% and 96.7% (Tables 7, 8).

Before concluding this necessarily concise note, we should like to draw attention to the pessimistic attitude of some physicians and midwives to the real possibility of curing cancer of the uterus, in relation to a recent investigation<sup>(6)</sup>. This attitude, in contrast to the active participation of the female population in the

Tab. 7. Survival 5 years after operation for cervical carcinoma in situ in 315 women.

Age	Alive	Died	q x %	p x %	x P <sub>0</sub>
0	315	2	0.63	99.37	100
1	313	3	0.96	99.04	313/315
2	310	2	0.64	99.36	310/315
3	308	—	—	100.00	308/315
4	308	2	0.65	99.35	308/315
5	306	—	—	100.00	306/315

sP<sub>0</sub>=97,76%

Tab. 8. *Survival 5 years after operation for microinvasive carcinoma in 61 women.*

Age	Alive	Died	q x %	p x %	x P <sub>0</sub>
0	61	1	1.63	99.27	100
1	60	—	—	100.00	60/61
2	60	—	—	100.00	60/61
3	60	1	1.66	98.34	60/61
4	59	—	—	100.00	59/61
5	59	—	—	100.00	59/61
sP <sub>0</sub> =96,72%					

screening program, is all the more disappointing because the Centre is involved in intense work at the level of information dissemination.

In conclusion, our experience at Ferrara may be considered satisfactory in the light of the results. It confirms the value of cytology in the early detection of cervical carcinoma and thus the possibility of markedly lowering the incidence of mortality from this disease by the periodic control of the population at risk.

### SUMMARY

By December 31<sup>st</sup> 1976, 84,903 women have been examined. This number is equivalent to 57 per cent of the female population of the Province of Ferrara, 20 years of age and over. Out of these 84,903 women, 55,061 had 2 examinations, 35,061 had 3 examinations. As many as 330 women have already come for a 14<sup>th</sup> examination.

Altogether 332 in situ, 271 invasive carcinomas of the cervix as well as 367 dysplasias have been detected.

There has been a decrease in the incidence of clinical invasive carcinoma in the screened population, from 2.6 per 1000 at the first screening to 0.05 per 1000 at the fourth screening.

By December 1970, 305 cases of in situ carcinoma and 61 cases of preclinical invasive carcinoma have been surgically treated. The 5 years survival was 97.7 per cent and 96.7 per cent, respectively.

The significant decrease in the incidence of clinical carcinoma in the re-screened population as well as the high rates of incipient cancers detected gives evidence of the efficacy of the mass screening programme in the Ferrara Province.

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### BIBLIOGRAPHY

1. Boyes D. A., Fidler H. K., Lock D. R.: *Brit. Med. J.*, 1, 203, 1962. - 2. Christopher-son V. M. The control of cervix cancer. *Acta Cytologica*, 10, 6, 1966. - 3. Fidler H.K., Boyes D. A., Worth A. J.: *J. Obstet. Gynaec. Brit. Cwlth.*, 75, 392, 1968. - 4. Kashgarian M., Dunn J. E.: *J. Epidemiology*, 92, 211, 1970. - 5. Kasper T. A., Smith E.S.O., Cooper P., Clayton J., Todd D.: *Acta Cytologica*, 14, 261, 1970. - 6. Pavanelli T., Scopa Sarto L.: *Minerva Ginecologica*, 27, 489, 1975.