Int J Public Health 52 (2007) 109–116
1661-8556/07/020109-8
DOI 10.1007/s00038-007-6015-z

Use of mammography and Pap smear in Estonia, a country without organized cancer screening

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Submitted: 13 February 2006; Revised: 4 October 2006; Accepted: 8 November 2006

Summary

Objectives: To analyze mammography and Pap smear status in Estonia where no organized population-based cancer screening is available.
Methods: 5000 individuals (aged 16–64) were randomly chosen from the national population register; among them, 1755 women filled out postal questionnaires.
Results: 50 % of respondents aged 45–64 reported having taken a mammogram, 51 % of women aged 25–64 had the Pap smear at least once in their lifetime. Corresponding figures for the past two years were 37 % and 30 %. Irrespective of age, women taking fewer tests over the past two years were rural workers, unemployed, and health behavior recommendations ignorers. In most cases, initiative for mammogram came from women, and from the physician in the case of Pap smear. Moderate increase in mammography use occurred after a project for early detection of breast cancer was launched.
Conclusion: Women must continuously be informed that early detection of breast and cervical cancer is possible. Young women should be encouraged to ask for Pap testing. Knowledge of family physicians should be improved.

Keywords: Mammography – Pap smear – Early detection of cancer – Non-attendance in screening tests – Health behavior.

Cervical cancer screening, first introduced in many countries, and breast cancer screening launched later, made women aware that it is possible and beneficial to detect cancer at an early stage (Meissner et al. 2004). Despite the lack of final knowledge on the effectiveness of mammography by age groups (Baines 2003), this is the only screening method today that helps reduce breast cancer mortality in the population (EBCN 2006). Cervical cancer screening with the use of Pap smear has reduced mortality and incidence of the disease (Anttila et al. 2004). Still, not all countries are able to launch cancer screening programs and little is known of their experience concerning early detection of cancer.

In 2003, there were 466924 women between the ages of 16–64 residing in Estonia, the smallest of the three Baltic countries. No internationally accepted organized cancer screening is being carried out in Estonia, although a project on early detection of breast cancer for the years 2002–2006 is currently in progress. The target group for the study includes women between the ages of 45–59 who have health insurance; every year women in the group with different years of birth are invited to have mammography. A similar project on cervical cancer detection for women in the age group of 25–54, covering the years 2003–2007, has been launched to a limited extent (Estonian Cancer Foundation 2004).

The objective of this paper is to examine the current status of mammography and Pap smear in Estonia; who receives these examinations, and how.

Methods

Data for this analysis were drawn from the 2004 Health Behavior Study among the Estonian Adult Population. The study is conducted each even year starting from 1990 (Kasmel et al. 2001) and is part of the Finbalt Health Monitor co-operative study in which Lithuania, Latvia and Finland participate as well (Puska et al. 2003). The study in 2004 was conducted and analyzed by the Department of

Epidemiology and Biostatistics at the National Institute for Health Development (Tervise Arengu Instituut 2005). The Tallinn Medical Research Ethics Committee approved the study.

From the national Population Register, a simple random sample of 5000 individuals, aged 16–64 was taken from the population of Estonia. Similarly to previous years, the study was conducted as postal questionnaire survey. After two weeks of the initial mailing, a reminder was sent to those who had not responded due to an unknown reason. If, after that, a person still failed to respond, the questionnaire was mailed for the second time in two weeks from the reminder. Questionnaires and reminders were compiled in both, Estonian and Russian.

Statistical analyses

Distribution of variables among respondents is described using prevalence ratio with a 95 % confidence interval and age-adjusted odds ratio. Analyses were carried out using Visual FoxPro 6.00 and STATA 7.0 software.

Results

Of 2593 women, 1755 responded (crude response rate 67.7 %). Response rate increased with age, being 62.7 % in the age group of 16–24 and 76.6 % in the age group of 55–64. The response rate was higher for rural population, especially when compared to the population of Tallinn, the capital of Estonia. Distribution of different age groups, Estonians and urban population among respondents was not significantly different from the corresponding figures for the population of Estonia in January 1, 2003.

Lifetime and recent use of mammography and Pap test

Half of the respondents aged 45–64 reported having had mammography at some point in their life. Among 16–64 year-olds, 44 % reported having had a Pap test; the corresponding percentage for the age group of 25–64 was 51 (Tab. 1). The proportion of women who had had mammography or Pap smear increased with age, for Pap test up to the age of 45–54. Within the past two years, 37 % of women aged 45–64 had had mammography, 27 % of all respondents and 30 % in the age group of 25–64 had had Pap smear.

Characteristics of women who had examinations within the past two years

Age-adjusted prevalence ratios showed that significantly more women with university degrees (compared to primary or basic education), monthly income per one family member higher than the minimal salary in Estonia (compared to lower than minimal salary), and women who engaged in physical exercise in leisure time at least twice a week (compared to not at all), had had mammography within the past two years (Tab. 2). Corresponding results for Pap test were: at least secondary education, monthly income per family member close to the average salary, engaging in physical exercise in leisure time at least twice a month, respectively. During the aforementioned period, women working in agriculture or the unemployed (compared to service workers, office clerks), non-Estonians and women with low health self-assessment, also daily smokers and women who had not had their cholesterol level measured, had had significantly less mammography. From the characteristics described above, only ethnicity had no influence on attending Pap test. Neither lack of health insurance nor place of residence or birth had any influence on having either examination within the past two years.

Initiator of examinations

Within the past two years, 38 % of women initiated taking of a mammogram, a physician sent 33 % to mammography and 29 % were invited to take part in a study (Tab. 3). The

Table 1 Distribution of responding women by having ever had mammography or Pap test, and age in Estonia, 2004

	Mammography						Pap test					
	Age group (years)						Age group (years)					
	16–24	25–34	35–44	45–54	55–64	Total	16–24	25–34	35–44	45–54	55–64	Total
Responded (No.)	316	332	325	383	371	1727	315	327	322	377	359	1700
Attended (No.)	10	28	68	190	187	483	42	114	159	239	196	750
Attendance ratio (%)	3.2	8.4	20.9	49.6	50.4	28.0	13.3	34.9	49.4	63.4	54.6	44.1
Attended within the past two years (No.)	8	13	39	146	132	338	38	80	111	145	83	457
Attendance ratio (%)	2.5	3.9	12.0	38.1	35.6	19.6	12.1	24.5	34.5	38.5	23.1	26.9

Table 2 Prevalence ratio, crude odds ratio and age adjusted odds ratio for having had mammography or Pap test within the past two years by background and health behavior variables in Estonia, 2004

		Mammography			Pap test		
		Prevalence ratio (%)	Crude odds ratio (95 % CI)	Age adjusted odds ratio (95 % CI)	Prevalence ratio (%)	Crude odds ratio (95 % CI)	Age adjusted odds ratio (95 % CI)
Education	primary, basic	16.0	1.0	1.0	11.8	1.0	1.0
	secondary	17.6	1.12 (0.75–1.67)	1.47 (0.94–2.30)	25.2	2.71 (1.77–4.14)	2.62 (1.68–4.09)
	secondary-vocational	18.8	1.22 (0.84–1.78)	1.36 (0.89–2.08)		3.33 (2.22–5.01)	2.51 (1.62–3.88)
	university	26.8	2.03 (1.37–3.02)	2.45 (1.56–3.87)	37.2	4.75 (3.09–7.30)	3.61 (2.28–5.70)
Employment status	employed:						
	agriculture[a]	14.8	0.60 (0.28–1.32)	0.35 (0.15–0.79)	14.8	0.45 (0.20–0.99)	0.39 (0.17-0.88)
	industry[b]	21.5	0.92 (0.60–1.41)	0.68 (0.43–1.09)	26.3	0.85 (0.56–1.28)	0.74 (0.48–1.13)
	service, office clerk	22.0	1.0	1.0	29.8	1.0	1.0
	medicine[c]	30.5	1.57 (1.11–2.21)	1.47 (0.99–2.19)	39.7	1.55 (1.11–2.16)	1.40 (0.99–1.98)
	unemployed	11.6	0.45 (0.23–0.91)	0.33 (0.16–0.70)	18.8	0.51 (0.29–0.92)	0.51 (0.28–0.94)
	at home	8.8	0.32 (0.18–0.57)	0.48 (0.25–0.90)	31.8	0.91 (0.62–1.34)	1.15 (0.77–1.72)
	retired	27.1	1.40 (0.95–2.07)	0.44 (0.28–0.70)	21.5	0.84 (0.55–1.30)	0.75 (0.46–1.23)
Monthly income per family member	up to minimal salary	15.0	1.0	1.0	25.2	1.0	1.0
	up to two minimal salaries	22.4	1.70 (1.26–2.28)	1.53 (1.11–2.11)	24.2	1.05 (0.80–1.37)	0.97 (0.73–1.29)
	up to average salary	22.6	1.72 (1.21–2.43)	1.79 (1.21–2.65)	33.5	1.55 (1.13–2.11)	1.64 (1.18–2.27)
	average salary or more	22.4	1.85 (1.14–3.01)	2.58 (1.46–4.56)	34.1	1.57 (1.02–2.43)	1.62 (1.03–2.56)
Ethnicity	Estonian	20.9	1.0	1.0	27.7	1.0	1.0
	non-Estonian	16.8	0.78 (0.60–1.02)	0.68 (0.51–0.92)	25.1	0.88 (0.69–1.12)	0.81 (0.63–1.04)
Health insurance	yes	20.2	1.0	1.0	27.5	1.0	1.0
	no	12.9	0.59 (0.33–1.02)	0.59 (0.32–1.09)	21.7	0.76 (0.48–1.23)	0.72 (0.44–1.18)
Measured cholesterol level	during last 12 month	33.2	1.0	1.0	34.1	1.0	1.0
	one to five years ago	24.0	0.64 (0.46–0.89)	0.76 (0.52–1.10)	31.3	0.82 (0.59–1.14)	0.83 (0.59–1.16)
	never	9.0	0.19 (0.13–0.27)	0.29 (0.20–0.43)	19.7	0.40 (0.30–0.54)	0.48 (0.35–0.67)
Smoking	every day	13.3	0.57 (0.40–0.81)	0.63 (0.43–0.93)	20.1	0.61 (0.44–0.83)	0.57 (0.41–0.80)
	occasionally	16.2	0.70 (0.44–1.13)	1.30 (0.75–2.24)	25.2	0.77 (0.51–1.17)	0.97 (0.62–1.51)

Table 2 Continued

		Mammography			Pap test		
		Prevalence ratio (%)	Crude odds ratio (95 % CI)	Age adjusted odds ratio (95 % CI)	Prevalence ratio (%)	Crude odds ratio (95 % CI)	Age adjusted odds ratio (95 % CI)
	previously	22.1	1.06 (0.77–1.47)	1.38 (0.95–2.00)	31.4	1.13 (0.83–1.54)	1.14 (0.82–1.57)
	never	20.8	1.0	1.0	28.0	1.0	1.0
Engaging in physical exercise in leisure time	daily	30.7	1.93 (1.20–3.10)	2.06 (1.19–3.56)	30.6	1.46 (0.89–2.39)	1.83 (1.08–3.10)
	2–6 times a week	20.1	1.01 (0.74–1.39)	1.79 (1.23–2.59)	31.3	1.32 (0.99–1.78)	2.06 (1.50–2.83)
	2–4 times a month	13.2	0.62 (0.44–0.89)	1.11 (0.75–1.65)	26.3	1.05 (0.78–1.41)	1.46 (1.06-2.01)
	not at all	19.3	1.0	1.0	23.6	1.0	1.0
	cannot exercise	29.7	1.89 (1.22–2.92)	1.05 (0.66–1.67)	29.9	1.51 (0.97–2.37)	1.39 (0.81–2.07)
Health self-assessment	good	10.0	0.34 (0.23–0.51)	0.96 (0.59–1.54)	21.8	0.59 (0.43–0.82)	0.89 (0.62–1.26)
	reasonably good	14.9	0.54 (0.40–0.75)	1.09 (0.76–1.58)	29.6	0.97 (0.74–1.27)	1.21 (0.90–1.63)
	average	23.8	1.0	1.0	27.3	1.0	1.0
	rather poor	32.5	1.57 (1.03–2.41)	1.27 (0.80–2.01)	33.9	1.36 (0.88–2.11)	1.23 (0.78–1.94)
	poor	15.3	0.62 (0.30–1.30)	0.43 (0.20–0.93)	16.9	0.48 (0.24–0.98)	0.46 (0.22–0.96)

a: agriculture, forestry, fishery
b: industry, construction, transport
c: medicine, culture, education, research

Table 3 Distribution of women having had mammography or Pap test within the past two years by age and initiator of examination in Estonia, 2004

	Mammography						Pap test					
	Age group (years)[a]						Age group (years)[a]					
	16–24	25–34	35–44	45–54	55–64	Total	16–24	25–34	35–44	45–54	55–64	Total
Had the examination (No.)	8	13	39	146	132	338	38	80	111	145	83	457
Examination initiated												
by woman (No.)	4	8	18	66	35	131	2	6	8	12	8	36
%	50.0	61.5	46.2	45.2	26.5	38.0	5.3	7.5	7.2	8.3	9.6	7.9
by physician (No.)	4	5	19	45	42	115	36	69	94	129	70	398
%	50.0	38.5	48.7	30.8	31.8	33.3	94.7	86.3	84.7	89.0	84.3	87.1
by invitation to study (No.)	0	0	2	36	61	99	0	6	9	5	6	26
%	–	–	5.1	24.7	46.2	29.3	–	7.5	8.1	3.4	7.2	5.7

a: percentage by column may exceed 100 as some women had the examination due to different reasons

Int J Public Health 52 (2007) 109–116

Table 4 Prevalence ratio of mammography and Pap test within the past two years, initiated by a physician or women, crude odds ratio and age adjusted odds ratio for mammography, initiated by women in Estonia, 2004

		Mammography				Pap test	
		Initiator (%)		Crude odds ratio (95 % CI)	Age adjusted odds ratio (95 % CI)	Initiator (%)	
		physician	woman			physician	woman
Education	primary, basic	36.2	21.3	1.0	1.0	85.3	5.9
	secondary	37.0	37.0	2.18 (0.95–5.00)	1.77 (0.75–4.17)	88.7	7.8
	secondary-vocational	36.0	40.4	2.50 (1.13–5.53)	1.93 (0.85–4.41)	88.1	8.0
	university	27.4	47.4	3.33 (1.49–7.46)	2.90 (1.26–6.68)	84.6	8.5
Place of residence	Tallinn	30.0	46.7	1.0	1.0	81.1	5.3
	other town	34.2	39.0	0.73 (0.43–1.24)	0.64 (0.37–1.12)	88.9	9.5
	rural areas	37.3	31.4	0.52 (0.29–0.94)	0.44 (0.24–0.82)	90.4	8.1
Employment status	employed:						
	agriculture[a]	50.0	–	–	–	100.0	–
	industry[b]	34.3	40.0	0.88 (0.41–1.88)	0.88 (0.40–1.91)	88.1	4.8
	service, office clerk	33.6	43.1	1.0	1.0	88.0	8.2
	medicine[c]	23.9	46.5	1.15 (0.65–2.04)	1.14 (0.64–2.05)	82.6	9.8
	unemployed	60.0	40.0	0.88 (0.24–3.27)	0.90 (0.24–3.41)	100.0	–
	at home	42.9	57.1	1.76 (0.58–5.36)	1.67 (0.54–5.22)	88.0	8.0
	retired	43.8	12.5	0.19 (0.08–0.47)	0.25 (0.09–0.65)	83.8	5.4
Monthly income per family member	up to minimal salary	36.7	38.9	1.0	1.0	89.2	8.1
	up to two minimal salaries	37.1	31.5	0.72 (0.42–1.25)	0.77 (0.43–1.36)	88.2	5.9
	up to average salary	28.8	45.2	1.30 (0.69–2.42)	1.46 (0.76–2.80)	84.1	10.3
	average salary or more	21.4	57.1	2.10 (0.89–4.95)	2.37 (0.97–5.78)	85.7	7.1
Ethnicity	Estonian	34.2	34.2	1.0	1.0	88.1	6.6
	non-Estonian	33.7	50.5	1.97 (1.22–3.19)	1.93 (1.16–3.19)	84.8	10.9

a: agriculture, forestry, fishery
b: industry, construction, transport

proportion of mammography initiated by a physician was more essential than the initiative of women themselves for the age group of 35–44 and, especially, for that of 55–64; still, most women in the latter group had mammography due to an invitation to participate in a study. Initiative for Pap smear came from a physician in most cases, irrespective of the woman's age; the percentages of women's own initiative and receiving an invitation to a study were 8 and 6, respectively. Due to the small number of women who had the Pap test on their own initiative, analysis of this group rendered impossible.

Characteristics of women who themselves initiated mammography

Women had mammography on their own initiative more often (age-adjusted data in comparison with all other) if they had a university degree (compared to primary or basic education) or were non-Estonians, and significantly less if they were rural residents (compared to capital residents) or retired persons (compared to service workers, office clerks); rural workers showed no self-initiative (Tab. 4).

Discussion

In Estonia, in the age groups of 45–64 and 25–64, where all women should have had mammography or Pap test at least once in their life, half the women reported having had the tests; 37 % and 30 %, respectively, reported having had these examinations within the past two years. Benefits for women who have had mammography or Pap test screening only once in their lifetime are not noteworthy. Mammography screening can detect breast cancer 3–4 years before

symptoms would be noticed (EBCN 2006). If a women can be screened only once for cervical cancer, the best age is 35–45 years (WHO 2006). Yet, none of the current screening methods can be effectively applied once in a lifetime (Cronje 2004).

The project on early detection of breast cancer in Estonia (started in 2002) invites women between the ages of 45–59 to have mammography. The age of those involved in the project has been set based on national age-specific breast cancer incidence rates (Aareleid & Mägi 2003) and financial affordability. European guidelines suggest mammography screening in women aged 50–69 (EBCN 2006) and screening Pap smear in 30(25)–65 year-olds (WHO 2006). Having mammography or Pap test on recommendation within the past two years was associated with certain socio-economic and health behavior factors in quite a similar way. Considering that initiative for mammography, in most cases, came from women themselves, and, for Pap smear, from a physician, such a small difference is somewhat surprising. Irrespective of age, lesser participants for either of the tests included rural workers (not rural residents, though), the unemployed, and health behavior recommendations ignorers.

Having mammography according to recommendations was also related to ethnicity and low health self-assessment. Many publications describing breast or cervical cancer screening, have noted that non-attendees are characterized by low income, unemployment, lack of health insurance, place of residence outside the city, belonging to ethnic minorities or being immigrant; age and education have a diverse effect (Nelson et al. 2003; Schootman et al. 2003; Coughlin et al. 2004; Hewitt et al. 2004; Meissner et al. 2004; Peek et al. 2004; Zackrisson et al. 2004; Barrett & Leggs 2005); utilization rates for screening programs were similar in all social classes (Röckl-Wiedmann et al. 2002). Lack of health insurance among recent immigrants has been shown to be one of the strongest predictors of low participation in cancer screening (Carrasquillo & Pati 2004). More than half of low-income women identified cost as a barrier to mammography; however, 40 % of these women had an inappropriate perception of their insurance coverage (McAlearney et al. 2005). Estonian Health Insurance Act is in force since 1992. According to the Act, some persons for whom no social tax is paid are considered as having equal status to insured persons. Among them are persons under 19 years of age, students in higher education who are permanent residents, and persons receiving state pension granted in Estonia. Analyzing respondent answers, it became evident that women, self-reporting to be uninsured, within the past two years, had had both examinations less than insured respondents (data not shown). Among others in this group were 30 students or retired persons. Justifiably incorporating them into the group of persons who had health insurance, the borderline significant association became insignificant. Non-Estonians had less mammography within the past two years than Estonians. In this group, the proportion of respondents with a university degree was smaller than among Estonians (data not shown); also, they might have been less informed as most information concerning projects on early detection of cancer is accessible in Estonian.

As there is no organized mass screening for cancer in Estonia, it is interesting to know how women reach these examinations. Initiative for a mammogram came from women in more cases than not, and from a physician in the case of Pap smear. It can be assumed that the higher number of referrals to mammography by a physician in the age groups of 35–44 and 55–64 (especially for under 40-s and over 60-s) could point to referrals due to manifestation of symptoms. Surprisingly, income had no impact on having mammography on a woman's own initiative, although women had to pay for all tests if they had no referral from a physician. Therefore, reasons behind low self-initiative for mammography among retired persons and rural residents must be other than lack of money. Higher utilization of mammography among women with a university degree seems to be conditioned by their higher self-initiative. Non-Estonians initiated mammography more often than Estonians.

It might be guessed that the answer to the question on the initiator of an examination – "invitation to a study" – refers mainly to the invitation to take part in the project on early detection of breast cancer, and less to the corresponding project on cervical cancer. A few women in a certain age (35–44 or over 59 for mammography and 55–64 for Pap test) who reported having received an invitation to a study were likely invited to take part in another study and not in projects for early detection of breast or cervical cancer. Certainly, some well informed women have mammography on their own initiative for screening reasons, yet, to a large extent, mammography is undertaken due to breast complaints, especially pain.

Compared to the year 2000 (Kasmel et al. 2001), the proportion of women in the age group of 16–34 who had had mammography, fortunately decreased in the year 2004; yet increased by 17 % and 13 % among 45–54 (who, since 2002, are involved in the project on early detection of breast cancer) and 59–64 year-olds (only 59 year-olds are involved), respectively. Compared to the indicators four years back, the percentage of women who had had a Pap

Int J Public Health 52 (2007) 109–116

test decreased by 6 %; among the youngest age group (16–24 year-olds) as much as by 10 %. Partially, the certain increase in mammography use among women in a certain age in Estonia can be contributed to the influence of the project on early detection of the relevant cancer. The project on cervical cancer detection is still in a very initial stage and it is too early to talk about its efficiency.

In 1997–1999, USA metropolitan areas screening attendance ranged 65–82 % for mammography (for age ≥40 years) and 77–92 % for Pap test (for age ≥18 years) (Nelson et al. 2003). Data for the years 2002 and 2004 indicate that 76 % of women in the US reported having had mammography within the past two years (Barrett & Legg 2005); the corresponding percentage for Pap test within the past three years was 83 (Hewitt et al. 2004). In Sweden, the attendance of target groups in breast cancer screening has decreased to 65 % for women who were invited in 1990–1993 (Zackrisson et al. 2004); in Finland this percentage was 90–93 for 1991–2000 (Sarkela et al. 2004). Smear test coverage in the course of organized screening is above 80 % in the target population in Finland, Sweden and the UK, at least 75 % in Denmark, Iceland and the Netherlands (Anttila et al. 2004).

Study limitations

The first limitation the study met is the unknown reason for having mammography or Pap smear wherefore it is impossible to distinguish the proportion of screening and, in that, the part of examinations done within the framework of projects for early detection of breast or cervical cancer. Results of similar studies have shown that, using postal questionnaires, it is difficult to get an answer to such a question that is fairly complicated for an average person (Coughlin et al. 2004). It must also be considered that existing data are self-reported. Consistent with many studies, real participation in screening is lower than reported by women, and self-report concerning examination frequency does not correspond to official data (Insinga et al. 2004; Peek & Han 2004). Results of meta-analysis revealed that self-report accuracy on screening histories for mammography and Pap test was comparable (Rauscher et al. 2005) or more problematic in the case of Pap smear (McPhee et al. 2002; Vernon et al. 2004). Having participated in a study in general was self-reported more accurately than recent participation; ethnic minority groups and people with low socio-economic status tend to be associated with lower estimated self-report accuracy (McPhee et al. 2002; Rauscher et al. 2005). Unfortunately, the choice of answers in our questionnaire (up to two years ago or more than two years ago) to the question on the time of the last examination does not give exact information on having Pap smear with a recommended interval. According to guidelines on cervical cancer screening in Estonia that have been put together, but have not yet been implemented, this interval is five years (Estonian Cancer Foundation 2005); in practice, physicians use a shorter interval for screening Pap smear.

Conclusions

Currently, in Estonia, the examinations described above are used comparably as much for age groups who need them the most (45–64 year-olds for mammography, 25–64 year-olds for Pap test) – 37 % and 30 % of women, respectively, reported having had the examinations within the past two years. Both indicators are low when compared to countries where there is screening of breast or cervical cancer. The described study results could be beneficial for doctors who, in the current situation in Estonia, have the deciding role in referring women to different examinations for cancer prevention; the results could also be used in a more effective informing of women. Irrespective of age, women who took fewer tests than others over the past two years were rural workers, the unemployed, and health behavior recommendations ignorers. A moderate increase in mammography use occurred after the project of early detection of breast cancer was launched. As there is no organized screening in Estonia and the initiative for a mammogram came from women themselves in most cases, we must continue informing them, also in Russian, that early detection of breast cancer is possible. Women, especially young women, should be further encouraged to ask for Pap testing. Knowledge of family physicians should also be improved so that they would send to mammography more women in the target age group, and especially those who will not self-initiate the examination – rural and retired women. Drawing from experience of other countries, we hope that after launching and continuously carrying out a population-based screening that corresponds to internationally accepted standards, the situation in Estonia in terms of the use of mammography and Pap smear for prevention will, after a number of years, improve.

Acknowledgements

This study was ordered and financed by the Estonian Ministry of Social Affairs, and supported by the Estonian Ministry of Education and Science target funding 01921112s02. The authors thank Tiiu Vahtramäe and Sille Saega for technical assistance.

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