EUROPEAN JOURNAL OF PUBLIC HEALTH 1999; 9: 290-296

Screening in primary care: health for all?

A study in Dutch general practice

KOOS VAN DER VELDEN, DOUGLAS M. FLEMING, HARALD ABRAHAMSE *

Background: In recent years there has been an increasing emphasis on the delivery of preventive care in general practice. At the same time, available evidence suggests people from lower social classes receive less preventive care compared with people from higher social class. The objective of this study was to assess the uptake of screening by blood pressure measurement, cervical cytology and manual breast examination in risk populations by patients attending their general practitioners and relate the findings to levels of educational attainment and type of health insurance. Methods: The study was based on data gathered in the Dutch National Survey of General Practice in which 161 GPs recorded sociodemographic data, reasons for encounter, diagnoses and interventions during a 3 month period. Persons receiving the above procedures as screening measures were counted and expressed as rates per 1,000 persons registered and per 1,000 persons consulting. These rates were examined at three levels of educational attainment and according to the health insurance of the patient using logistic regression methods. Results: When analysed by educational attainment, high levels of blood pressure measurement were found in persons of lower educational attainment in both males and females (30-59 years) while for cervical cytology (35-54 years) higher levels were found amongst the better educated and for breast examination (40-69 years) the rates were similar regardless of educational attainment. When analysed by insurance status parallel trends were observed, with higher rates for blood pressure measurement among the publicly insured and higher rates for cervical cytology among the privately insured. Conclusions: The results, whether based on persons registered or persons consulting, suggest no important social bias in the extent to which persons are screened by blood pressure measurement or breast examination. There were strong social gradients for cervical cytology favouring the better educated and privately insured. More effective targeting of women with low educational attainment and publicly insured is called for.

Keywords: general practice, health, primary care, screening

Differences in health status and health care utilization by socio-economic group are well documented.[1-4] Social gradients are evident in mortality statistics from several countries. For example, in The Netherlands males in lower social classes showed a significant increase in risk of death from cardiovascular diseases compared with higher social classes.[5] Women in lowest social class are more likely to die of cancer of the cervix than those in highest social class.[6] For a few cancers, however, including breast cancer, there is a greater risk of death in higher social classes.[6] It is clear that in the prevention of avoidable mortality and morbidity, strategies should address the problems of differing patterns according to socioeconomic group.

In recent years, much attention has been given to the implementation of screening programmes through general practices.[7-14] Screening is achieved either by the systematic screening of persons approached proactively or the opportunistic screening of persons contacting a health facility for a purpose unrelated to the screening activity.[15,16] Particular initiatives have been taken in Canada, the UK and The Netherlands, all exploiting the fact that general practitioners have frequent contact with patients from all sections of society. Many general practitioners are willing to run preventive programmes in their practices. However, general practitioners can be inconsistent and sometimes even paradoxical in their views and actions on prevention.[17,18] Practice automation, practice management and supportive staff are not always optimal. It remains unclear whether and to what extent general practitioners succeed in reaching all sections of society. Theoretically, increased frequency of contact provides increased opportunities for delivering preventive care and it is known that persons in lower social classes consult their general practitioners more frequently than those in higher classes.[19,20] However, there is evidence that persons in low income groups or of low educational level do not take advantage of preventive health care services.[2,3,12,21]

In this study our aim was to investigate the uptake of screening activities of Dutch general practitioners and to

* J. van der Velden[1], D.M. Fleming[2], H. Abrahamse[3]
1 NSPH, Utrecht, The Netherlands
2 RCGP Unit, Birmingham, UK
3 NIVEL, Utrecht, The Netherlands
Correspondence: Dr J. van der Velden, MD MPH, Dean NSPH, Netherlands Institute of Primary Health Care (NIVEL), P.O. Box 1568, 3500 BN Utrecht, The Netherlands, tel. +31 30 2729700, fax +31 30 2729729

examine these findings in relation to the education and health insurance status of the patient.

METHODS

Subjects and measurements

Data from the Dutch National Survey of General Practice were used.[21] Recording for this study involved a random, non-proportionally stratified sample of 161 general practitioners. Age and sex data were obtained for the entire study population (N=335,000) as well as a set of socio-demographic data for 91.2%.[22] The 161 general practitioners were divided into four groups and each was required to register every contact between the practice and patients for three consecutive months, thereby covering a whole year. Registration included reason(s) for encounter, diagnosis and interventions. Altogether 386,000 consultations were registered and the morbidity data were coded according to the *International Classification of Primary Care*.[23] Information on practitioner activities in the survey period included records of blood pressure measurement, cervical smear tests and manual breast examination.

Records of males and females aged 30–59 years were examined for evidence of recorded blood pressure; those of women aged 35–54 years for records of a cervical smear test and those of women aged 40–69 years for records of manual breast examination undertaken as part of a preventive care programme. At the time of the study the Dutch National Breast Cancer Screening Programme had not yet started.

Educational attainment was categorized as low (no education/primary school education), middle (secondary school with limited higher professional education) or high (high professional education, usually university). Health insurance was categorized as public insurance, private insurance inclusive (inc.) of general practitioner services and private insurance exclusive (exc.) of general practitioner services. Insurance arrangements in The Netherlands are mainly determined by income (employment related).

Statistical analysis

Person consulting rates (all causes) and screening uptake rates per registered population were calculated in the relevant age and sex groups. Persons with pre-existing high blood pressure or known hypertension, with known cervical cancer or consulting for a gynaecological reason and persons with breast cancer or other symptoms of breast disease which would prompt the doctor to undertake a breast examination were excluded from both numerator and denominator. Screening uptake rates per persons consulting were also calculated.

These rates were examined in relation to education and health insurance applying logistic regression methods using SPSS to obtain odds ratios with 95% confidence intervals (CI), whereby the influence of each variable could be examined separately. Bivariate and multivariate logistic regression procedures were used, controlling for age (5 year bands). The results presented are solely for the multivariate analyses, as those for the bivariate analyses were very similar.

RESULTS

In the 3 months reference period, 45.1% of the males and 57.3% of the females aged 30–69 years consulted at least once. There were inverse associations with educational level and inverse associations with the type of health insurance in both males and females (*table*). *1*

With regard to the population eligible for screening for hypertension (age group 30–59 years), more men than women had high levels of education and more were privately insured. In total there were twice as many women with reported measurements of blood pressure. The socio-economic compositions of the female populations eligible for the three screening activities by educational attainment and type of insurance were similar except for breast examination, where less women in the high education group were eligible.

The relative probability of screening provision by education and insurance groups analysed by the registered population and by persons consulting is given in *table 2*. Examining first the probabilities based on the registered population, for blood pressure measurement there was an inverse trend with educational level evident in both males and females; for cervical cytology a strong positive trend and for breast examination no trend. When assessed by insurance status, both males and females with exclusive private insurance were least likely to have been screened for blood pressure. For cervical cytology, the highest probability existed in persons insured in the inclusive

Table 1 Registered population (30–69 years) and persons' consulting rates (all causes) in 3 months by level of education and type of health insurance: multivariate odds ratios (OR) with 95% CI

	Males			Females		
	Registered population n	OR	95% CI	Registered population n	OR	95% CI
Education						
Low	16,090	1.00		20,659	1.00	
Middle	34,397	0.86	(0.82–0.89)	35,875	0.88	(0.84–0.91)*
High	9,688	0.73	(0.69–0.77)*	5,378	0.80	(0.75–0.85)*
Insurance						
Public	36,527	1.00		41,508	1.00	
Private (inc.)	18,386	0.71	(0.68–0.74)*	15,871	0.76	(0.74–0.80)*
Private (exc.)	5,262	0.52	(0.48–0.55)*	4,533	0.56	(0.53–0.60)*
Total persons	60,175			61,912		

* p<0.01

private programme: both categories of private insurance reported higher rates for this preventive measure than were found in publicly insured patients. There were no significant differences for breast examination, although a trend is visible.

When examined by persons consulting, no differences were observed in the analysis of blood pressure measurement by education for male or female patients or for breast examination. However, for cervical cytology the probability was considerably higher the better educated the woman. When assessed by health insurance, the probability of screening uptake was higher for those in private insurance schemes (both types) for blood pressure measurement and cervical cytology and almost for breast examination.

Screening uptake rates were obviously much higher when expressed per person consulting compared with per registered population (not in table).

DISCUSSION

This study has shown higher person consulting rates (all causes) in both sexes among persons with low levels of education and persons insured within the public insurance system. These findings are in keeping with the Fourth Morbidity Survey in General Practice, which was undertaken in England and Wales in 1991–1992, in which there were higher rates of persons consulting in social classes III, IV and V.[24] Loss of consultation data for selected groups of the population is unlikely though some persons in the exclusive private insurance sector may have gone directly to specialists, bypassing the general practitioner. The number for whom this may have occurred is sufficiently small that the impact on the study results and their interpretation can be ignored.

It is important to note that the risk populations defined in this study are not identical to those specified in the guidelines of the Dutch College of General Practitioners.[25] These were defined later. The age groups studied here were those generally considered appropriate at the time of the study. Routine mammography was not available.

In the assessment of screening activities, population-based rates for blood pressure screening were lower among the better educated and privately insured. Using rates based on persons consulting, the situation was reversed, with higher rates among privately insured and little difference in the rates associated with different levels of education. The benefits of screening for hypertension could largely be expected in the spheres of ischaemic heart disease and cerebrovascular disease both of which are more frequent in socially disadvantaged groups.[3,4] It is certainly encouraging to find higher population-based rates in the comparatively disadvantaged group but analysis based on persons consulting showed higher rates among the privately insured, indicating greater attention given by general practitioners to this aspect of medical care when privately insured persons consult. This finding suggests room for improvement in the delivery of this screening programme to the educationally and economically disadvantaged. Though the relativity of the result was similar in both male and female patients, the absolute numbers of persons with recorded blood pressure were considerably higher among females. This was due to the increased potential for measuring the blood pressure of women as they consulted for family planning.

The results of screening cervical cytology showed consistently higher rates among the educationally advantaged and privately insured. Considerable care was taken to

Table 2 Uptake of screening activities per 1,000 registered population and per 1,000 persons consulting in relation to education and health insurance: multivariate odds ratios with 95% CI

	Blood pressure							
	Males		Females		Cervical cytology		Breast examination	
Per 1,000 registered population								
Education								
Low	1.00		1.00		1.00		1.00	
Middle	0.93	(0.84–1.03)	0.92	(0.85–0.99)*	1.41	(1.13–1.76)**	1.03	(0.78–1.35)
High	0.77	(0.66–0.91)**	0.83	(0.73–0.94)**	1.52	(1.10–2.08)**	1.04	(0.61–1.77)
Insurance								
Public	1.00		1.00		1.00		1.00	
Private (inc.)	0.98	(0.88–1.08)	0.98	(0.91–1.05)	1.48	(1.24–1.77)**	1.15	(0.86–1.53)
Private (exc.)	0.78	(0.65–0.92)*	0.87	(0.77–0.97)*	1.39	(1.04–1.85)*	1.17	(0.75–1.82)
Per 1,000 persons consulting								
Education								
Low	1.00		1.00		1.00		1.00	
Middle	1.02	(0.93–1.14)	0.97	(0.90–1.05)	1.49	(1.19–1.86)**	1.07	(0.81–1.41)
High	0.93	(0.79–1.09)	0.93	(0.81–1.05)	1.68	(1.21–2.31)**	1.15	(0.68–1.97)
Insurance								
Public	1.00		1.00		1.00		1.00	
Private (inc.)	1.22	(1.10–1.35)**	1.11	(1.03–1.20)**	1.70	(1.42–2.04)**	1.31	(0.98–1.74)
Private (exc.)	1.21	(1.01–1.45)*	1.18	(1.03–1.35)*	1.94	(1.45–2.60)**	1.54	(0.99–2.39)

* $p<0.05$; ** $p<0.01$

exclude persons having a cervical cytology examination because of gynaecological symptoms. However, we could not identify women who had had a hysterectomy, most of whom should have been excluded from the denominator. A recent survey in The Netherlands indicated that, of all women in the age group 35–54 years, 7.7% have had a hysterectomy.[13] This percentage is not likely to be less in the educationally advantaged and privately insured. Accordingly, the results presented may even underestimate the differences between the educational levels and health insurance groups. These results are disturbing though they may truly reflect an increased wish of well-educated women to take advantage of this preventive measure. In 1997 screening policy changed to include women aged 30–59 years with routine screening repeated every 5 years.

The results for breast examination disclosed no significant differences in the various subgroups analysed. It has been pointed out that mortality from breast cancer is higher in women from higher social classes. It is also the case that screening the asymptomatic patient by manual breast examination has not been scientifically validated. It has largely been replaced by mammography though the technique of breast self-examination has to be taught and may be useful in identifying breast lumps at an early stage. For these reasons, the results for this screening programme are not the matter of concern generated by the other two.

There are various possible ways in which screening could be improved in general practice to address the deficiencies identified in this paper. It reinforces the need for health education in the widest sense of the public at large and of health professionals. The administration and organization of general practice in The Netherlands is conducive to the delivery of preventive care because of the patient registration arrangements and because most practices have now employed practice nurses. All three items of preventive care described in this paper could be delivered by practice nurses, as successfully implemented in the UK in recent years. Another finding, that some women would find these screening measures more acceptable when provided by a female doctor, should also be taken into consideration.[26] Responsibility for providing preventive care needs to be defined more precisely. There is a difference between guidelines for good practice and a contractual responsibility to make specified services readily available. Doctors need to be appropriately trained in population risk assessment and in strategies for effective screening. Continuous audit and feedback are necessary to monitor achievements. Where there are agreed national policies for screening there needs to be matching reimbursement.[27] This principle has worked well in the UK for cervical cytology and childhood immunization. This study has clearly identified some limitations of opportunistic screening in general practice. Only systematic screening can really make a big impact on mortality and morbidity in a population. General practice has a role in prevention and health promotion, but its contribution is only part of a comprehensive health policy.[28]

REFERENCES

1 Brotherston J. Inequality: is it inevitable? In: Carter CO, Peel J, editors. Equalities and inequalities in health. London: Academic Press, 1976.

2 Townsend P, Davidson N. Inequalities in health: The Black Report. Harmondsworth: Penguin, 1982.

3 Mackenbach JP. Ongezonde verschillen (Unhealthy differences). Assen: Van Gorcum, 1994.

4 Marmot M, Ryff CD, Bumpass L, Shipley M, Marks NF. Social health inequalities: next questions and converging evidence. Soc Sci Med 1997;44:901-10.

5 Schopman-Geurts van Kessel JG. Risk factors and mortality in the DOM cohort [dissertation]. Amsterdam: VU Uitgeverij, 1991.

6 Coebergh JWW. Incidence and prognosis of cancer in The Netherlands: studies based on cancer registries [dissertation]. Rotterdam: Erasmus University Rotterdam, 1991.

7 Lalonde M. A new perspective on the health of Canadians: a working document. Ottawa: Department of National Health and Welfare, 1974.

8 World Health Organization. The contribution of general practitioners to Health for All. Copenhagen: WHO, 1991.

9 Department of Health. The Health of the Nation: a strategy for health in England. London: Department of Health, 1992.

10 Ministerie van Welzijn Volksgezondheid en Cultuur. Preventiebeleid voor de volksgezondheid. 's-Gravenhage: SDU, 1992.

11 Hart JT. Coronary heart disease prevention in primary health care: seven lessons from three decades. Family Pract 1990;7:288-94.

12 Austoker J. Cancer prevention in primary care. BMJ 1994;308:1415-20.

13 Pas L, editor. General practice and cancer prevention in Europe: the involvement of general practitioners in cancer screening programmes. Gent: Mys & Breesch, 1993.

14 Rosser WW, Lamberts H. Do our patients receive maximum benefit from preventive care? A North American perspective. Br J Gen Pract 1990;40:426-9.

15 Hakama M. Screening. In: Holland WW, Detels R, Knox G, editors. Oxford textbook of public health. Oxford: Oxford University Press, 1991:91-106.

16 Mackenbach JP. Screening: nieuwe mogelijkheden, nieuwe controversen? (Screening: new opportunities, new controversies?) Ned Tijdschr Geneeskd 1995;139:734-9.

17 Hart JT. A new kind of doctor. London: Merlin Press, 1988.

18 Mant D. Prevention. Lancet 1994;344:1343-6.

19 Groenewegen PP, Hutten JBF, van der Velden J. List size, composition of practice and general practitioners' workload in The Netherlands. Soc Sci Med 1992;34:263-70.

20 Crombie D. Social class and health status: inequality or difference. Exeter: Royal College of General Practitioners, 1984.

21 Foets M, van der Velden J, de Bakker DH. Dutch National Survey of General Practice: survey design. Utrecht: NIVEL, 1992.

22 van der Velden J, de Bakker DH, Claessens AAMC, Schellevis FG. Dutch National Survey of General Practice: morbidity in general practice. Utrecht: NIVEL, 1992.

23 Lamberts H, Wood M. International classification of primary care. Oxford: Oxford University Press, 1987.

24 McCormick A, Fleming D, Charlton S, editors. Royal College of General Practitioners/Office of Population Censuses and Surveys/Department of Health. Morbidity statistics from general practice. Fourth National Study 1991-1992. London HMSO, 1995.

25 Rutten GEHM, Thomas S. NHG-Standaarden voor de huisarts (NHG-standards for the general practitioner). Utrecht: Nederlands Huisartsen Genootschap, 1993.

26 van den Brink-Muinen A, Bensing JM, de Bakker DH. Female health problems: a task for female general practitioners. Br J Gen Pract 1994;44:205-10.

27 Ghez GR, Grossmann M. Preventive care, care for children and national insurance. In: Pauly MV, editor. National health insurance: what now, what later, what never? Washington, DC: American Enterprise Institute for Public Policy Research, 1980:137-80.

28 Fowler G. WONCA Conference 1997 in Prague. Prevention and health promotion: whose responsibility? Eur J Gen Pract 1998;4:42-5.

Received 9 September 1998, accepted February 1999