

Factors influencing participation in health surveys Results from prospective population study 'Men born in 1914' in Malmö, Sweden

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SUMMARY Base line data together with data in public registers and a structured phone interview of 94 of the 121 non-attenders was used for an assessment of factors influencing participation in the prospective population study 'Men born in 1914' in Malmö, Sweden. The overall attendance rate was 80.5% but varied among areas in the city from 27% to 100%. The lower participation rate among single men remained, when correcting for social class, significant only for single men in social class III. Men who did not feel well and/or had been admitted to hospital during the last 12 months had a lower participation rate. A negative attitude towards health surveys in general was the most common reason for non-participation. The phone interview turned out to be a feasible method to reach non-attenders to assess whether the sample was representative of the population and to learn more about reasons for non-participation.

A low participation rate in a population survey may seriously invalidate the results due to the selection bias caused by non-response. In order to avoid this problem we should try to reduce the number of non-attenders to an absolute minimum. For this we have to know more about what influences the participation rate in health surveys.

Published studies of non-participation in population surveys have mostly used different public registers to compare characteristics of attenders and non-attenders.^{1,2} Although this gives some information as to the potential of selection bias, it does not tell us how to improve the participation rate. This would require an interview of those who did not attend the examination. This approach was used in a small sample of non-attenders by Tibblin³ in his study of 50 year old men.

The cohort study 'Men born in 1914' living in Malmö, Sweden, is a prospective study of the morbidity and mortality of respiratory and cardiovascular diseases and their major determinants in older men. Recruitment and base line examinations were performed and completed in 1982–83. The aim of the present part of the study, which is based on the results from the base line study together with information in public registers and a telephone interview of non-attenders, was to assess

whether the study population was representative and to assess reasons for non-participation.

Material and methods

The study population consisted of all men living in Malmö who were born in an even month in 1914. The study group was defined every fourth month starting in August 1982. This procedure was adopted to reduce the risk of mailing the invitation to someone who had died or left town after the study population had been defined. The majority of this cohort of 621 men had participated in a health survey in 1969–70 focusing on arteriosclerotic leg disease and its relation to smoking habits, hypertension, and hyperlipidaemia.⁴

The purpose of the study, the examinations and interviews included, and data handling was described in a letter. This letter was followed up a couple of weeks later by a phone call from our secretary to confirm consent to participate and to make the necessary appointments.

The purpose and design of the study were also described in a letter mailed to all doctors in the city.

Men who refused to participate in the study were called by one of the physicians in the study programme. Those who could not be persuaded to

participate were asked if they would participate in a phone interview. For this we used a standardised form which covered civil status, housing, education, previous occupation, tobacco consumption, utilisation of medical care in the last 12 months, present medication, and subjective assessment of health. This interview also covered the main reason for non-participation. This procedure had been approved by the Ethical Research Committee at the university.

About 10% of the men had no phone or an ex-directory phone number. The non-participants in this group were visited at home by one of the physicians in the study. For the home interview we used the standardised phone call questionnaire.

Registers within the planning unit at the City Council were used for sociodemographic characterisation of areas with a low participation rate.

STATISTICAL METHODS

The χ^2 RC contingency table and Fisher's exact test were used for comparison of frequencies. Geographical differences in participation rate were tested with the χ^2 goodness of fit test for unity. *p* Values greater than 0.05 were considered statistically non-significant.

Results

PARTICIPATION RATE

Of the 621 invited men, 500 (80.5%) came to the examinations. Of the 121 who did not come, 94 were contacted and agreed to participate in a phone interview: 11 (1.8%) of the remaining 27 men had died after the study population had been defined; 16 (2.6%) men either refused to be interviewed or could not be reached. Among the 27 who could not be reached for a phone interview there was an overrepresentation of single men and an overrepresentation of men depending on social welfare compared to both attenders and the 94 who agreed to participate in the phone interview.

The overall participation rate in 1982 (80.5%) was significantly lower than it was when the 1914 cohort was invited in 1969: 86.9% ($p < 0.01$). Among men who had moved into the city after 1969 the participation rate was even lower (74.7%)

GEOGRAPHIC VARIATION IN PARTICIPATION RATE

The participation rate in 17 different areas within the city ranged from 27% to 100% ($p < 0.05$). One area with a participation rate significantly lower than average is that surrounding the Department of Community Medicine, the city hospital, and the

Department of Preventive Medicine. This area has a higher unemployment rate and a higher share of single person households and households with a larger utilisation of social welfare.

CHARACTERISTICS OF ATTENDERS AND NON-ATTENDERS

Civil status

Civil status was significantly different among attenders and non-attenders ($p < 0.05$). Of the non-attenders 62% were married compared to 79% of the attenders. Of the non-attenders 14% had never been married, 16% were divorced, and 8% were widowers. Among the attenders corresponding percentages were 7%, 6%, and 8%.

Social class

Social class is based on educational background and occupation.⁵ In general, social class III represents blue collar workers, social class II white collar workers, and social class I civil servants in leading positions, professionals with university degrees and owners of business enterprises. The distribution of these three social classes was not significantly different among attenders and non-attenders. Fourteen percent of the attenders belonged to social class I, 36% to social class II, and 50% to social class III.

Since the distribution of social class was different in single and married men we also assessed the separate influence of civil status and social class on participation rate. When correcting for civil status, social class had no influence on participation. Civil status in our study had an influence on participation rate only in social class III where the attendance rate among single men was only 67% compared to 84% ($p < 0.05$) among the married men.

Housing conditions

Housing conditions were equal in the two groups. About one out of five on average were house owners.

Contact with doctor

Of both attenders and non-attenders 75% had been in contact with a doctor at least once during the last 12 months. In the two groups 45% were using at least one medication at the time of the study.

Smoking habits

The percentage of smokers and the median daily tobacco consumption was equal in attenders and non-attenders. Of the men 37% were smokers and 45% were ex-smokers. The median daily tobacco consumption in both groups was 10 g.

Alcohol abuse

Using the files at the City Social Welfare Board it was found that the social assistance act and/or law on temperance had until 1982 been applied to 28.9% of the non-attenders and 15.6% of the attenders ($p < 0.05$). The percentage of men who during the period 1968–82 had been in contact with the Department of Alcohol Diseases was about three times greater among non-attenders (7.4%) than among the attenders (2.4%) ($p < 0.01$).

REASONS FOR NON-PARTICIPATION

Attitude towards health surveys, present illness, and/or contact with doctor

The table shows the main reasons for non-participation among married and single men in all social classes. Due to small numbers, widowed, divorced, and never married men were taken as one group. Reasons for non-participation were coded by one person. Two main reasons were distinguished. One was present illness and/or regular contact with a doctor. The other main reason was a negative attitude towards health surveys either because of previous experience or because of fear of the examinations or the results of the examinations. A negative attitude towards health surveys was the major reason for non-attendance among both married and single men in social classes I and II. This negative attitude was about twice as frequent among non-attenders in social class I as in social class III. Among the non-participating single men and men in social class III more than half were unwilling to participate because of present illness and/or regular contact with a physician.

Subjective assessment of health

The subjective assessment of health was based on a scale from 1 (poor) to 8 (excellent). The participation rate among 275 men rating their health 7–8 was 89.5%. Among 139 men who rated their health 6 it was 79.1%, and among 166 who rated their present health status 1–5 it was 81.9% ($p < 0.05$). Of the non-attenders 25% and of the attenders 12% had

been hospitalized at least once during the last 12 months ($p < 0.05$).

Discussion

The feasibility of random population sampling as a method for studying the epidemiology of a disease depends on the public attitude towards population surveys. A low participation rate in a population survey may seriously invalidate the results owing to the selection bias caused by non-response. In Sweden today, news media discuss the potential threat that different computer based registers, including health registers, might impose on our integrity. The often one-sided negative attitude held by the mass media might seriously impair the participation rate even in projects where personal benefit seems obvious and of great value, such as in vaccination programmes or in programmes for early cancer detection. Although our phone call interview did not cover specifically the public attitude to health surveys and to computer based registers, it is interesting to observe the negative attitude to health surveys held by the majority of non-attenders. The fact that the attendance rate was lower than it was in 1969 when this cohort was first invited to a general health examination might be an effect of ageing but could also indicate that there is a change in the public attitude towards health surveys.

From other studies it is known that the prevalence of different chronic disorders and alcoholism is greater among non-responders. This is supported by the results in our study. These differences between participants and non-participants were, however, not observed in the general health survey of 70 year old men in Gothenburg⁶ where the rate of non-participation was about the same as in our study.

Although non-participants differed from participants in many respects, assessments of the average 68 year old man's educational background, housing, economy, civil status, disability, medical care and use of medication, smoking habits, and alcohol abuse were not significantly changed when information from the phone interviews of the 94 non-attenders was added to that of the 500 who came to be examined.

Our experience from the telephone interviews is that this is a simple and feasible method for reaching those who do not wish to participate in the examinations. We also learned from the telephone interviews how important it is to follow up the letter of invitation with a phone call. Obviously many of the invited men had misunderstood the object of the health examination as presented in the letter of invitation. By having one of the physicians in the project follow up the letter with a phone call we were

Reasons for not participating

Main reason	Social class					
	All n=94 %	Married n=64 %	Single n=30 %	I n=12 %	II n=23 %	III n=59 %
Ill and/or regular contact with doctor	45	38	60	9	39	53
Afraid of examinations and/or negative attitude towards health surveys	55	62	40	91	61	47
			$p < 0.05$		$p < 0.05$	

able to convince some of those who initially did not wish to participate in our study.

With the telephone interview we were also able further to assess and clarify reasons for non-participation. Subjective assessment of health seemed to be one factor influencing participation. Men who felt well had a significantly higher participation rate than men who rated their health status as poor. This illustrates the potential selection bias associated with non-response. It might be that by wording the invitation differently, participation among men who did not feel well could be improved. In our invitation we did not explicitly point out how important it was that even if one was ill or had regular contact with the hospital or a private physician or that one could not see the personal benefit of coming to the clinic it still would be of great value if one participated in the programme since the outcome and the importance of the study depended on a high participation rate. The geographic differences in participation rate and the low participation rate among single men in social class III could again suggest that the letter of invitation should be worded so that men in different areas and with different backgrounds could fully understand and appreciate the value and object of the offered health survey.

Our results suggest that perhaps different letters of invitation should be used in different areas of the city. Whether this will improve the participation rate

remains to be clarified in a control trial. Our impression, which also should be confirmed in a control trial, is that participation probably can be much improved if a letter of invitation is followed up by a phone call by one of the physicians involved. The telephone interview, using a structured questionnaire, seems further to be a feasible method to assess whether the random sample is representative of the population.

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