Education, prevalence of disease, and frequency of health care utilisation

The 1983 Italian National Health Survey

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SUMMARY The relation between education, prevalence of 17 chronic diseases or groups of diseases, and pattern of health care utilisation was evaluated from data from the 1983 Italian National Health Survey, based on 58 462 individuals aged 25 or over randomly selected within strata of geographical area, size of place of residence, and size of household, in order to be representative of the whole Italian population. Most of the diseases considered, including diabetes, hypertension, myocardial infarction and other heart disease, haemorrhoids or varices, chronic respiratory disease, anaemias, gastroduodenal ulcer, cholelithiasis and liver cirrhosis, kidney and urological diseases, arthritis, and psychiatric and neurological disturbances, were consistently less prevalent among more educated individuals. The age and sex adjusted risk estimates for individuals educated in high school or university compared with those with only a primary school education or less ranged between 0.21 for liver cirrhosis and 0.80 for anaemias. The sole exception was allergy, which was more prevalent among the more educated individuals (relative risk = 1.42). General practitioner visits and hospital admissions were reported less frequently by the more educated individuals, but specialist consultations of potential preventive value were less frequent among the less well educated. The results were similar when occupation was utilised as an indicator of social class. Thus, the findings of this national survey provide confirmation and quantitative assessment of considerable differences in health and health service utilisation according to indicators of social class.

Social class is a strong determinant of health. Mortality data by occupation and social class, for instance, collected since 1851 by the Registrar General of England and Wales indicated that in the 1970s overall age standardised mortality was 2.5 times greater in social class V (lowest) than in social class I. The causes of death most strongly related to indicators of social class were perinatal and infant mortality, respiratory diseases, and accidents or violence in men.²⁻⁹

Less information is available on morbidity and patterns of health care utilisation in various social classes. The 1983 National Health Survey conducted by the Italian Central Institute of Statistics (ISTAT)¹⁰

gave us the opportunity to consider the relation between indicators of social class, prevalence of selected diseases, and frequency of utilisation of health care services on a large, randomly selected sample representative of the whole Italian population. The major findings on the relation between education and health are summarised and discussed.

Materials and methods

THE 1983 NATIONAL HEALTH SURVEY

The second National Health Survey was conducted by the Central Institute of Statistics during the week of 28 November to 3 December 1983. A sample of 31 025

households (a total of 89 753 individuals) was randomly selected within strata of geographical area (region), size of municipality, and size of household, in order to be representative of the general Italian population. Interviews were arranged and conducted by civil servants (appointed by each municipality included in the study) in the houses of the families identified. An inability to trace some families and a refusal by some to be interviewed led to the substitution of 2 058 households, giving an overall participation rate for the original sample of 93.4%. Proxy interviews were permitted for members not present in the house (8.3% of the sample considered).

Information was collected on sociodemographic characteristics (ie, marital status, education or occupation), current health status, prevalence of 19 chronic diseases or groups of diseases (including major cardiovascular conditions, respiratory and digestive tract disorders, renal and urinary tract diseases, arthritis and nervous disorders), health care service utilisation during the month (for outpatient procedures) or the year (for inpatient procedures) preceding the interview, smoking habits, and coffee and alcohol consumption.

We obtained from the Central Institute of Statistics copies of the original computer tapes including all available information for each subject. The total numbers of subjects included in the present analysis, stratified for sex, broad age group, and education, are shown in table 1. Subjects below age 25 were not considered, leaving a total of 27 912 men and 30 550 women.

DATA ANALYSIS AND CONTROL OF CONFOUNDING FACTORS

We estimated the relative risks (RR) for the prevalence of selected diseases and indicators of health care utilisation, together with their 95% confidence intervals¹¹ according to level of completed education from data stratified for sex and age in decades by means of the usual Mantel-Haenszel procedure.¹² For

the purpose of this presentation, education was preferred to occupation as an indicator of social class, since information on the latter variable was not meaningful for a large proportion of women (housewives), and we had no information on the head of the household's occupation.

Results

The distribution of the sample according to sex, age, and education is given in table 1. Men were better educated than women (22% of men v 16% of women had a high school education or university degree), and a marked influence of age (or birth cohort) on education was evident (30% of subjects aged 25-44 had a high school education or university degree v only 7% of those aged 65 or over).

The estimated overall prevalence of selected diseases or groups of diseases and the corresponding age and sex adjusted relative risks according to various levels of completed education are shown in table 2. Among the 17 diseases considered, 16 were less prevalent among more educated subjects, the sole exception being allergic conditions, which showed a significantly positive class gradient. The estimated relative risks for more educated people were substantially below unity for liver cirrhosis (RR=0.21 compared with subjects with primary school education or less), bronchial asthma (RR=0.36), chronic bronchitis (RR=0.43), and heart disease other than myocardial infarction (RR=0.50).

Two further groups of diseases included in the questionnaire were not considered, since information on them was judged to be largely unreliable. These were neoplasms, an account of the possibility that a proportion of patients were not even aware of their disease, and rheumatoid arthritis, whose estimated overall prevalence (85.6/1000) was probably largely inflated by misclassification with common arthritis.

Table 3 gives the frequency of outpatient consultations with general practitioners and selected

Table 1 Number of subjects included in the 1983 Italian National Health Survey by the Central Institute of Statistics, according to sex, age group, and education.

Completed Education	Men			Women		
	25-44 yr	45-64 yr	≥65 yr	25-44 yr	45-64 yr	≥65 yr
Primary school or less	3925	7279	4111	5093	8955	5718
Middle school	3977	1876	463	3570	1566	487
High school or university	3845	1705	475	3401	1102	354
Unknown	92	73	91	88	87	129

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Table 2 Relative risk estimates (and 95% confidence intervals) of prevalence of selected diseases or groups of disease according to education, Italy, 1983 National Health Survey

Disease or group of diseases	Estimated overall prevalence/1000 population	Relative risk estimates* among subjects with completed education		
		Primary school or less	Middle school	High school or university
Diabetes	48.7	1† (2292)‡	0.76 (0.68–0.86) (321)	0.62 (0.53–0.71) (219)
Hypertension	101.5	1† (4636)	0.79 (0.72–0.86) (696)	0.76 (0.69–0.84) (567)
Myocardial infarction	10.7	1† (681)	0.96 (0.79–1.17) (123)	0.68 (0.54–0.87) (79)
Other heart diseases	59.3	1† (2867)	0.66 (0.58–0.74) (342)	0.50 (0.44–0.58) (220)
Haemorrhoids or varices	61.9	1† (2549)	0.84 (0.76–0.92) (580)	0.75 (0.67–0.83) (468)
Chronic bronchitis	66.4	1† (3126)	0.62 (0.55–0.69) (446)	0.43 (0.38–0.49) (281)
Emphysema or respiratory insufficiency	23.2	1† (1077)	0.72 (0.60–0.86) (156)	0.64 (0.52–0.77) (119)
Bronchial asthma	38.4	1† (1897)	0.50 (0.43–0.58) (202)	0.36 (0.30–0.43) (129)
Allergy	35.9	1† (1168)	1.09 (0.97–1.24) (418)	1.42 (1.26–1.60) (497)
Anaemias	14.0	1† (596)	0.79 (0.65–0.97) (129)	0.80 (0.65–0.99) (111)
Gastroduodenal ulcer	56.3	1† (2346)	0.73 (0.66–0.81) (548)	0.54 (0.48–0.60) (373)
Cholelithiasis	36.4	1† (1623)	0.75 (0.65–0.85) (287)	0.65 (0.56–0.75) (206)
Liver cirrhosis	4.3	1† (210)	0.65 (0.45–0.93) (34)	0.21 (0.12–0.36) (9)
Urolithiasis	17.0	1† (688)	0.84 (0.70–1.01) (160)	0.79 (0.65–0.96) (139)
Renal insufficiency	14.7	1† (681)	0.65 (0.53–0.81) (104)	0.51 (0.40–0.66) (69)
Arthritis	242.9	1† (10,897)	0.65 (0.61–0.69) (1847)	0.53 (0.50–0.57) (1363)
Psychiatric and neurological disorders	68.6	1† (2858)	0.76 (0.69–0.83) (654)	0.60 (0.54–0.67) (466)

* Mantel-Haenszel estimates adjusted for age and sex.

† Reference category.

‡ The number of subjects with disease is given in parentheses.

specialists during the month before the interview and of hospital admissions during the previous year. Compared with the less well educated category, subjects with a high school education or university degree had RR ratios of 0.79 and 0.51 for one and more than one general practitioner visit. Corresponding values for hospital admissions (both public and private hospitals) were 0.76 and 0.47 respectively. By contrast, more educated people tended to use more frequently selected specialist services. Table 3 gives RR ratios for gynaecological visits during the preceding month (RR = 2.07 for more v less well educated category) and visits to the dentist (RR = 1.79).

Discussion

The findings of the 1983 Italian National Health Survey indicate that education is a strong determinant

of the prevalence of several chronic conditions. Better educated people experienced substantially lower risks of diabetes, hypertension, heart conditions, chronic respiratory diseases, anaemias, several gastrointestinal, renal, and urological diseases, and psychiatric or neurological complaints. Among the groups of diseases considered, only allergies were more frequent in the better educated categories. The pattern of health care utilisation also varied extensively according to education, general practitioner visits and hospital admissions being less frequent but various specialised outpatient consultations more frequent among the better educated population.

Selection bias is unlikely to play an important role in this study, since the sample was large and representative of the whole Italian population in terms of distribution for age, sex, and region of residence; participation rate was satisfactory, since less than 7%

Table 3 Relative risk estimates (and 95% confidence intervals) of selected measures of health care utilisation according to education, Italy, 1983 National Health Survey

Indicator of health care utilisation	Estimated overall frequency %	Relative risk estimates* among subjects with completed education		
		Primary school or less	Middle school	High school or university
Number of outpatient visits †				
General practitioner				
1	19.1	1‡ (7579)§	0.91 (0.86–0.97) (1926)	0.79 (0.74–0.85) (1575)
≥ 2	6.5	1‡ (2954)	0.69 (0.62–0.76) (482)	0.51 (0.45–0.58) (334)
Gynaecologist				
≥ 1	3.0	1‡ (355)	1.63 (1.37–1.93) (260)	2.07 (1.75–2.45) (296)
Dentist				
≥ 1	1.4	1‡ (395)	1.30 (1.08–1.57) (176)	1.79 (1.50–2.14) (219)
Number of hospital admissions‡				
1	7.8	1‡ (3182)	0.87 (0.80–0.95) (843)	0.76 (0.62–0.95) (669)
≥ 2	1.3	1‡ (567)	0.77 (0.62–0.95) (111)	0.47 (0.36–0.62) (61)

* Mantel-Haenszel estimates adjusted for age and sex.

† During the month before the interview.

‡ Reference category.

§ The number of subjects with positive history is given in parentheses.

|| During the year before the interview.

of the households originally sampled were substituted, and proxy interviews covered fewer than 10% of individuals.

Thus the major problems in the interpretation of this dataset pertain to information bias, since the questionnaires were administered by non-medically trained civil servants, and no further check was made of the reliability of the diagnoses. It is therefore possible that the less well educated people tended systematically to overreport the prevalence of conditions whose diagnosis is frequently imprecise (for example, other heart disease, bronchitis or arthritis). Information bias alone, however, is unlikely to account entirely for the large variation in prevalence observed according to education category and concerning also other diseases whose diagnosis is certainly more defined and hence less subject to misclassification bias (for example, myocardial infarction and diabetes). Further, apart from allergic diseases which were positively related to education, the risk estimates for several other conditions were not uniform either, and this is not easily explained in terms of information bias.

Thus, although diagnostic uncertainties may be substantial, they do not entirely eclipse the finding of a higher prevalence of several chronic conditions among

the less well educated people. Similar analyses were conducted using occupation instead of education as an indicator of social class. Although the sample size was reduced by the absence of information for a large proportion of women and older individuals, the overall evidence was consistent with the data presented.

These results were in agreement with evidence from other developed countries based chiefly on mortality data, showing higher rates for total mortality and several important diseases among the lower social classes. These differences persisted over more recent calendar periods, even in Britain where a National Health Service has been in operation for several decades.²⁻⁹

Social class differences in morbidity and mortality probably reflect complex multifactorial aetiologies. For instance, among Italian men heavy drinking was considerably more frequent and smoking slightly more frequent in the less well educated category, but the relation of education to smoking was the reverse in women, since cigarette smoking was still markedly more frequent among better educated, upper social class women.¹³ Nonetheless, the large majority of the chronic conditions considered were more prevalent among the less well educated women as well, thus

indicating that current alcohol and tobacco consumption cannot alone account entirely for the large social class differences in health.

In this survey we found that the pattern of health care service utilisation in Italy, which has been covered since 1980 by a National Health Service, is similar to that in Britain.^{2,3} In fact, although most common services (ie, general practitioner visits or total hospital admissions) were more frequent among the less well educated part of the population, some specialised services (especially of preventive value) were utilised more frequently by the better educated people.

In conclusion, the results of this survey provide confirmation and quantitative assessment of considerable differences in health and health service utilisation according to indicators of social class, which should be considered carefully for the purpose of health care planning and allocation of resources.

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