Interpreting self reported limiting long term illness

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Abstract

***Objective*—To examine the association between self reported limiting long term illness and other dimensions of self reported health.**

***Design*—Stratified random sample of general population.**

***Setting*—Lothian region, Scotland, in 1993.**

***Subjects*—6212 men and women aged 16 and over.**

***Main outcome measures*—Limiting long term illness was assessed by the same question as used in the 1991 United Kingdom census. The short form 36 health survey was used to assess other dimensions of health.**

***Results*—Rates of limiting long term illness were much higher than reported in the census. Scores on general and physical health scales had strong associations with limiting long term illness, but after adjustment for these associations psychosocial health measures had little influence on limiting long term illness. Being at the lower rather than the upper quartile on the physical functioning scale more than doubled the odds of having limiting long term illness. Reported prevalence of many common illnesses was between two and three times higher among those with limiting long term illness.**

***Conclusions*—A positive response to the question used by the census to define limiting long term illness was strongly associated with physical limitations on activity and less strongly influenced by scores on scales of mental and social wellbeing. Socioeconomic effects on limiting long term illness seem largely mediated through measures of general health and physical limitations on health.**

Questions relating to long term illness in census and general household survey

1991 Census

About each person in a household, "Does the person have any long-term illness, health problem or handicap which limits his/her daily activities or the work he/she can do? Include problems which are due to old age." Respondents could tick one of two boxes labelled "Yes, has a health problem which limits activities" or "Has no such health problem."

1992 General household survey (interview survey)

"Do you have any longstanding illness, disability or infirmity? By long standing, I mean anything that has troubled you over a period of time or that is likely to affect you over a period of time." Respondents who answered "yes" were then asked, "What is the matter with you?" and "Does this illness or disability limit your activities in any way?"

Introduction

While the general household survey has for many years asked questions about longstanding illness[1] the inclusion of a question about limiting long term illness in the 1991 population census[2] (see box) provides the first opportunity for examining the prevalence of such illness at small area level throughout Britain. This specific measure of population health status is likely to influence resource allocation and service delivery.[3,4] It is therefore important to identify how limiting long term illness reflects other aspects of health status. We examined the associations between limiting long term illness and measures of health status derived from the short form 36 (SF 36) health survey,[5] which is valid and reliable in British populations.[6-9] We also provide information on self reporting of specific illnesses in relation to limiting long term illness.

Methods

In 1993 we carried out a population health survey in Lothian region, southeast Scotland, with several aims, one of which was to obtain an overall description of self reported health status.[10] Both the census question on limiting long term illness and the SF 36 health survey were included in the postal questionnaire. The sampling frame was the community health index, a computer file of all people with an address in Lothian who were registered with a general practitioner. We used a non-proportional design, with equal sized samples of 2500 randomly selected from each of the age groups 16-44, 45-64, 65-74, and ≥75. The achieved sample was 6212, representing a response rate of 78% after adjustment for undelivered questionnaires and people who had died whose names had remained on the community health index. Overall, results for the adult population of Lothian were obtained by weighting with the Registrar General for Scotland's 1991 mid-year population estimates for Lothian.

The SF 36 health survey comprises 12 questions, with varying numbers of items in each, which measure nine dimensions of health: physical functioning, physical role limitation, emotional role limitation, social functioning, bodily pain, mental health, vitality, general health, and change in health. For respondents who completed some but not all items on a particular scale or dimension, a value was calculated on the basis of the completed items. The percentage of respondents who returned a questionnaire but gave no response to any of the items on a particular scale ranged from 1·6% (102/6212) (general health) to 5·0% (310/6212) (emotional role limitation). Scores on each dimension are scaled from 0 to 100 (0=worst health, 100=best health).

Logistic regressions were performed with SAS (version 6·09, procedure Genmod).[11] SF 36 scores were treated as continuous variables, entering linearly into the regression model.

Results

Rates for limiting long term illness ranged from 12% (152/1235) in the 16-44 age group to 63% (933/1476) in the ≥75 age group, with an overall rate of 24% among all respondents aged 16 or over. These rates were considerably higher than reported by the 1991 census for Lothian, which found an overall rate of 15%. The rates agreed better with those reported for Great Britain by the general household survey[1] (table I). After exclusion of those who did not answer "yes" to any of the physical role limitation items of the SF 36 the agreement with the general household survey was quite close.

The mean values on the SF 36 scales were closely

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TABLE I—*Rates of limiting long term illness in Lothian health survey, census for Lothian, and general household survey. Values are numbers (percentages)*

Age (years)	Lothian health survey, 1993*: Total No	Lothian health survey, 1993*: Respondents reporting limiting long term illness	Lothian health survey, 1993*: Respondents reporting limiting long term illness and physical role limitations§	Census of Lothian 1991†: Respondents reporting limiting long term illness	General household survey, Great Britain 1992‡: Respondents reporting limiting long term illness
16-44:					
Men	559	76 (14)	52 (9)	7739/156783 (5)	461/4610 (10)
Women	677	71 (10)	54 (8)	7187/162725 (4)	642/4938 (13)
45-64:					
Men	810	237 (29)	184 (23)	13911/755472 (18)	712/2739 (26)
Women	851	230 (27)	167 (20)	12958/81811 (16)	745/2864 (26)
65-74:					
Men	799	389 (49)	286 (36)	9040/27107 (33)	416/1039 (40)
Women	1034	441 (43)	364 (35)	10592/35480 (30)	472/1241 (38)
≥75:					
Men	549	311 (57)	254 (46)	7338/15594 (47)	294/601 (49)
Women	927	535 (58)	454 (49)	17754/33291 (53)	505/972 (52)

*Residents registered with general practitioner. Respondents who failed to answer relevant questions are included in denominators of percentages.
†Residents in private households and communal establishments.
‡Residents in private households. Numerators were estimated from rounded percentages in general household survey report.[1]
§At least one of the physical role limitation items in the SF 36.

similar to those found in other British surveys.[6-8] For those 65 or over with limiting long term illness the mean values agreed closely with a recent study in South Wales.[9] The distributions of scores on these scales were, however, highly skewed. Table II shows estimates of the quartiles of each scale in the adult population of Lothian.

TABLE II—*Median and quartiles of SF 36 health survey scales in Lothian's adult population*

	Lower quartile	Median	Upper quartile
Physical functioning	75	95	100
Social functioning	75	100	100
Physical role limitation	49	100	100
Emotional role limitation	67	100	100
Mental health	64	80	90
Vitality	50	65	80
Bodily pain	61	81	100
General health	57	76	87

All of the 35 individual items in the SF 36 health survey showed highly significant associations with limiting long term illness. The associations were generally higher for items involving physical functioning and limitations, and pain than for items involving emotional and mental wellbeing. The figure shows this feature clearly, with the points much closer together for the mental health and vitality scales than they are for the physical functioning and physical role limitation scales.

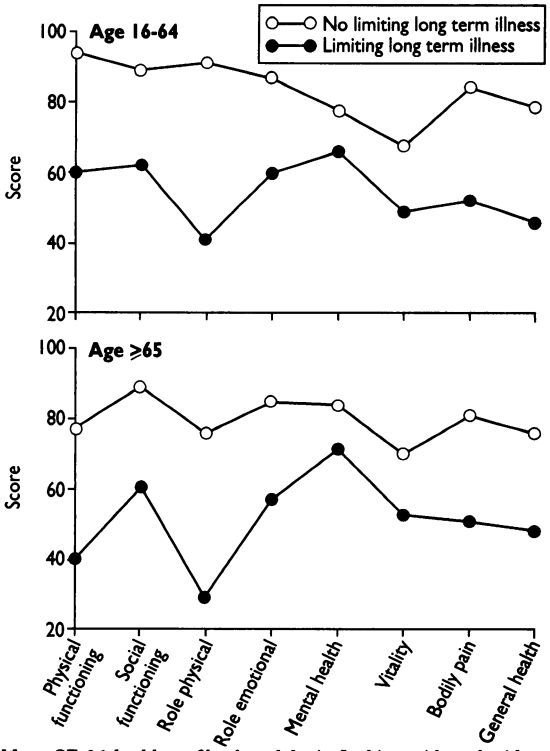
Logistic regression models were fitted for the dependence of limiting long term illness on the SF 36 health scales. The initial model incorporated age, sex, social class, and eight of the scales (excluding change in health). After adjustment for age and sex, four of the eight scales—general health perception, physical functioning, physical role limitation, and bodily pain—had independent, significant, and large effects. The mental and social wellbeing scales had much smaller coefficients, some of which, although significant, showed an inverse association with limiting long term illness. The effects of social class were also small, and adding other background variables—such as car ownership and home tenure—did not greatly improve the model. Table III shows the final model estimates reached after successive elimination of terms with small coefficients.

TABLE III—*Effects of age, sex, and four scales from SF 36 health survey on chance of having limiting long term illness. Values are estimated odds ratios (95% confidence interval) from logistic regression model*

General health perception (lower quartile (57) *v* upper quartile (87))	3·4 (2·9 to 3·9)
Physical functioning (lower quartile (75) *v* upper quartile (95))	2·3 (2·1 to 2·5)
Physical role limitation (lower quartile (49) *v* upper quartile (100))	1·6 (1·4 to 1·8)
Bodily pain (lower quartile (61) *v* upper quartile (100))	1·7 (1·5 to 2·0)
Age:	
45-64 *v* 16-44	1·8 (1·4 to 2·4)
≥65 *v* 16-44	2·7 (2·1 to 3·6)
Sex (male *v* female)	1·8 (1·5 to 2·1)

The estimates show that the odds of having limiting long term illness were over three times greater for someone at the lower quartile on the general health scale than for someone at the upper quartile; the odds for someone at the lower quartile on the physical functioning scale were more than double those for someone at the upper quartile; and the odds for someone at the lower quartile on the physical role limitation or bodily pain scale were more than 50% higher than for someone at the upper quartile. To illustrate the simultaneous effect of changes on several health scales, the probability of a limiting long term illness for a man aged 65 or over who is at the lower quartile for his age group on each of the four scales included in the model, was estimated as 94%, whereas for a man of the same age at the upper quartile on each scale the probability was only 12%.

The survey also asked respondents if they had suffered in the past year from any of a list of "illnesses and problems" (irrespective of whether they had seen a doctor about it). Table IV shows the differential rates of reporting 12 of these illnesses by those with and without limiting long term illness.



Mean SF 36 health profiles for adults in Lothian with and without limiting long term illness

Discussion

Studies using the broader, general household survey's definition of longstanding illness have found that, while both physical and psychosocial health scales have significant associations with longstanding illness, the physical health associations are stronger.[8,9] Comparing unadjusted measures of association is, however, less satisfactory than our multivariate model, which indicates that general and physical health scales explain most of the variation in limiting long term illness, with little explained by psychosocial factors.

This finding needs to be interpreted cautiously. The wording of the census question about health problems which "limit your daily activities or the work you can do" is likely to encourage respondents to think of physical health problems. The SF 36 measures of social functioning, emotional role limitation, mental health, and vitality include fewer items than the measures of physical functioning and role limitation. Physical health limitations are easier to define and less stigmatising to admit, while the complexity of experience underlying psychological illness is hard to encapsulate in a few closed questions. Other studies have found significant associations between various indices of social support or isolation and mortality even after adjustment for a wide range of physical symptoms, history of disease, sociodemographic variables, and self perceived health.[12-14]

Interpretation of terms and the nature of self reporting mean that the rates in table IV are only rough indications. They suggest that most of these conditions are between two and three times more common among those with limiting long term illness than those without. The relative risks for each condition are similar in both age groups but rather higher for heart disease and diabetes than for most of the other conditions.

Census rates of limiting long term illness vary considerably between areas even after standardisation for age and sex—ranging, for example, from 23% in Rhondda to 7% in the Isles of Scilly.[2] Attempts have been made to incorporate this variation in models for allocating resources between health authorities[3] or setting general practitioners' fundholding budgets.[4] Our survey identified higher overall rates of limiting long term illness than did the census in Lothian, but in the absence of other studies integrating the census question and more extensive measures of self reported health it seems useful to take our findings as a starting point.

TABLE IV—*Numbers (percentages) of respondents reporting specific illnesses in past year by presence or absence of limiting long term illness*

Illness	Age 16-64 years		Age ≥ 65 years	
	With limiting long term illness (n=614)	Without limiting long term illness (n=2197)	With limiting long term illness (n=1676)	Without limiting long term illness (n=1382)
Arthritis or painful joints	332 (54)	417 (19)	1056 (63)	525 (38)
Low back pain or sciatica	301 (49)	517 (24)	687 (41)	332 (24)
Eyesight problems	258 (42)	527 (24)	855 (51)	415 (30)
Stomach or digestive problems	221 (36)	417 (19)	570 (34)	276 (20)
Foot problems	141 (23)	264 (12)	637 (38)	263 (19)
Hearing problems	135 (22)	220 (10)	687 (41)	359 (26)
Kidney or bladder problems	98 (16)	110 (5)	369 (22)	124 (9)
Asthma or chronic bronchitis	111 (18)	132 (6)	318 (19)	69 (5)
High blood pressure	117 (19)	132 (6)	486 (29)	263 (19)
Heart disease or angina	86 (14)	22 (1)	486 (29)	97 (7)
Diabetes	43 (7)	22 (1)	134 (8)	28 (2)
Depression	221 (36)	352 (16)	369 (22)	111 (8)

Key messages

- Rates of limiting long term illness based on local and national surveys are much higher than those based on the census
- Most of the variation in these rates is associated with general health perceptions and physical limitations on health
- After adjustment for general health and physical limitations, measures of mental health and social wellbeing have little association with limiting long term illness
- Common health conditions are two to three times more prevalent among those with limiting long term illness

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ONE HUNDRED YEARS AGO

SUCCESSFUL LIGATURE OF THE INNOMINATE ARTERY.

Mr. Coppinger's patient, whose innominate and carotid arteries were simultaneously ligatured in 1893, and whose progress towards recovery was noted in the BRITISH MEDICAL JOURNAL during many weeks, is now about being presented for inspection in London. The operation was performed at the Mater Misericordiæ Hospital in January, 1893. The patient was shown six weeks later at a meeting of the Royal Academy of Medicine in Dublin as a case of successful ligature of the innominate artery, and was exhibited six months afterwards at the meeting of the British Medical Association at Newcastle-on-Tyne, as an instance of cure of subclavian aneurysm by simultaneous ligature of the innominate and common carotid arteries. The patient, a man, aged 55, is now in good health—two years and a-half after operation—and is the only living example as yet exhibited in Europe of cure of subclavian aneurysm by innominate ligature.

(*BMJ* 1895;ii:379.)