Asking the right questions of disadvantaged and homeless communities: the role of housing, patterns of illness and reporting behaviours in the measurement of health status

Abstract

Objective: To assess the self-reported health status and its relationship to key demographic variables among patrons of a charity-run meals service at The Exodus Foundation, in urban Sydney, Australia.

Methods: Random-sample cross-sectional study of 100 face-to-face interviews (79% recruitment rate). Self-reported health status was measured by subjective rating scale, open-ended and checklist questions about presence and type of acute and chronic disease. Analysis by logistic regression of fair-poor health status on demographic variables in Exodus patrons and general Sydney population adjusted for age and sex using the 1995 National Health Survey.

Results: Compared to housed but poor counterparts *within* the Exodus sample, homeless people were significantly more likely to report fair-poor health status (age-adjusted OR=3.0, 95% CI 1.3- 7.1). Exodus patrons, as a whole, were much more likely than Sydney's general population to report fair-poor health status, after adjusting for age and sex (OR=4.5, 95% CI 2.9-7.0) and had a more serious pattern of illness (diseases of the digestive system; depression; common cold; bronchitis; refractive errors; drug and alcohol dependence; diabetes mellitus Type II). Exodus patrons reported fewer acute and chronic illnesses with open-ended questions than with a checklist ($p<0.001$).

Conclusion: In this population there was a strong relationship between poor health and homelessness. When patterns of illness and injury were measured within this disadvantaged group, they showed more serious illness types than in the general population. Such patterns may not be identified by methods often used in traditional population health surveys.

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Understanding the relationship between social disadvantage and health status has taxed the skills of public health researchers for decades.[1-3] The need to better understand this relationship has been accompanied by an evolving sophistication in its measurement and mounting social concern[4-7] about the apparently widening gap in health status between the rich and poor that has been observed in many developed countries.[8-10]

Many facets of this relationship have been explored. Income distribution patterns have been related to poor health in some studies[11-14] while low social capital has been identified in others as an indicator of disadvantage and associated poor health.[15-17] Ecological studies have identified geographical areas most at risk of social disadvantage through mapping models based on a range of demographic criteria.[18-20] These studies potentially attribute poor health to a number of factors, such as employment, education and urban planning. Surprisingly few studies, however, have specifically examined the relationship between housing and health. Those that have[21] report a gradient of health status that is directly proportional to the quality of housing and living conditions of that population. In particular, poor health status is related to crowding, social isolation and lack of security of tenure when comparing wealthy neighbourhoods with their working-class counterparts. However, it is unclear whether this disturbing trend continues when the poor but housed are compared with the homeless.

Recent attempts to enumerate the homeless and seriously disadvantaged, despite being hampered by methodological issues, have indicated that this section of the community may be substantial and increasing in size.[1-3,22-24] A recent Australian study[25] used adapted WHO methodology[26] to estimate that the excess disease burden associated with socio-economic disadvantage in Australia is almost 20% of the total male and approximately 15% of the total female burden. Yet while the overall burden of poverty appears to be substantial and increasing, the patterns of illness within this group, particularly among the seriously disadvantaged, remain undefined.

Traditionally, the measurement of health status in most general population health

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surveys[19,27] has relied on a subjective measurement of self-report and the optional addition of an objective self-report. However, the use of such instruments in disadvantaged groups, may not provide reliable information. Recent work[28] has highlighted the need for refining instruments that can more accurately measure health status across socio-economic groups that may respond differently to standard tools.

This paper reports a study developed to measure the self-reported health status of a seriously disadvantaged subgroup of the general Sydney population and examines different dimensions in the measurement of the relationship between poverty and poor health in such communities.

Summary points

- Subjective measures of self-reported health status relate strongly to accommodation status.
- Objective measures of self-reported health status in disadvantaged populations should explore the *patterns* of health problems, not just the presence or absence of illness and injury.
- Disadvantaged communities appear to suffer from more serious health problems and may not report minor health problems as frequently.
- Objective health status measures should include checklists to follow an open-ended question.
- Disadvantaged communities perceive improved health to be a high-priority unmet need.
- National health surveys should seek to tie socio-economic factors to health status, particularly accommodation level along with income. (Income measures should account for the cost of housing.)

Subjects and methods

This cross-sectional study consisted of 100 semi-structured face-to-face interviews conducted between 4 May and 7 December 1998. One hundred and forty subjects were randomly selected according to the seat they chose while eating lunch at the church-based meals service provided by The Exodus Foundation, a Uniting-Church sponsored program in inner western Sydney. Numbers were allocated to a seating plan at the beginning of the study. At the beginning of each meal, the person sitting in the seat associated with the next randomly generated number was approached about an interview. If this person had been approached previously, the seat was vacant, or they refused an interview, the person in the next seat numbered in the random series was approached and so on. At the completion of each interview, another approach for interview was made using the same selection method until the mealtime concluded. This allowed for both early and latecomers to the meals-service to be included in the study. Approximately two or three interviews were conducted each day.

The size of the population using the Exodus Foundation meals service is unknown. Nevertheless, it was estimated that a sample size of 100 would allow us to estimate the percentage of the population reporting fair-poor health with a 95% confidence error of no more than 10%. It would also give 80% power to detect as significant at the two-sided 5% level, associations between demographic variables and health status with an odds ratio of around 3.5 or an absolute difference in percentages of 25-30%.

Table 1: Characteristics of Exodus and general Sydney samples.

Characteristic	Exodus community	Sydney[a]
Mean age (15 years and older)	49.4 years	54.3 years
Sex ratio (male:female)	4:1	1:1
Low accommodation status[b]	39%	0.5%
Single	93%	48%
Left school <16 years	57%	29%
Unemployed	36%	5%
Fair/poor self-reported health status	48%	16%
Good/very good/excellent self-reported health status	52%	84%
Smoking	42%	23%

Notes:
(a) Based on 1996 Census of Population and Housing and 1995 National Health Survey, Australian Bureau of Statistics.
(b) Low accommodation status refers to 'homeless' as defined by Chamberlain & MacKenzie 1992.

Subjects were ineligible if they were aged less than 15 years, had insufficient English-speaking skills or failed a cognitive assessment screening test prior to and during the interview process. These screening criteria had been used in an earlier study with a similar population[29] and excluded subjects on the basis of poor memory, lack of orientation, delusional thoughts, apparent intellectual disability, reporting more than four admissions to psychiatric hospitals or intoxication at interview.

Respondents were asked a series of demographic and health-related questions. A single researcher conducted all interviews and responses noted in-situ. Demographic variables included age, sex, marital status, level of current accommodation, education, employment status and smoking. The categorisation method for accommodation status used was that adopted by the Australian Commonwealth Department of Family and Community Services.[30,31] Within the Exodus sample, low accommodation status was defined by the government-adopted criteria for homelessness. This includes people living in boarding houses as well as those who are unsheltered or staying in crisis accommodation.

To assess self-reported health status in this study, standardised questions were taken from the 1995 National Health Survey (NHS).[32] This general population survey used stratified multistage area sampling across all States and Territories between February 1995 and January 1996 to conduct approximately 54,000 face-to-face interviews with a representative sample of the Australian population.[33]

Table 2: Association between demographic factors and fair/poor health status *within* the Exodus sample.

Category	No. (%) with fair/ poor health	*p*-value	Unadjusted odds ratio (95% CI)
Univariate Analysis			
Age = 47 years (median)	27 (55)	0.15	1.8 (0.8-4.1)
Male	36 (51)	0.48	1.4 (0.6-3.3)
Recent unemployment (<12 months)	40 (48)	0.89	0.9 (0.3-3.3)
Lower education level (left school <16 years)	24 (44)	0.19	0.6 (0.3-1.3)
Low accommodation status[a]	24 (63)	0.02	2.64 (1.2-6.1)
Low literacy	10 (56)	0.54	1.4 (0.5-3.9)
Lives alone	42 (50)	0.90	1.0 (0.8-1.3)
Australian-born	27 (44)	0.21	0.6 (0.3-1.3)
Smoking	20 (48)	0.95	0.9 (0.44-2.18)

Note:
(a) Low accommodation status refers to 'homeless' as defined by Chamberlain & MacKenzie 1992.[31]

Questions about health status were posed to the Exodus sample in the following sequence:

a. Subjects were asked whether, in general, they would say that their health was excellent, very good, good, fair or poor.[32]
b. Subjects were asked to report the presence and type of acute illness in the two weeks prior to interview, using the NHS actions-based approach.[27]
c. Subjects were asked to report the presence and type of chronic health problems present for at least six months duration as in the NHS.
d. Subjects were asked whether they suffered from any health problems in a 20-item checklist. A 36-item checklist was used in the NHS,[32] but this proved too long during piloting. The 18 least prevalent items in the NHS results were removed. To ensure that the 10 most prevalent conditions reported in two studies of Sydney homeless communities[29,34] were also included, mental illness and liver disease were added. To check that the inclusion of these two additional items in the checklist did not overestimate their prevalence compared with the NHS population, the checklist and open-ended responses for these conditions were analysed separately.
e. Finally, to determine the priority our subjects gave to improved health, respondents were asked to list three items they would wish for to improve their lives.

As for the NHS, reported health conditions were coded using the ICD-9 classification-based system and a participant was recorded as having a particular chronic condition if they reported it via either the open-ended or checklist questions.[27] The relative frequencies of the 10 most common illnesses are reported after direct age-sex standardisation to the NHS NSW population estimates.[35]

The subjective measure of self-reported health status was dichotomised into fair/poor and good/very good/excellent and the Exodus sample was compared with general metropolitan Sydney using the 1995 NHS tabulated data. This analysis was adjusted for age and sex by logistic regression.[36] That is, the proportion of subjects reporting fair/poor health in each age-sex group were regressed on age group, sex and population group. Similarly, the proportions with a chronic illness and with three or more chronic illnesses were compared, adjusting for age and sex. Each of the 10 most prevalent health conditions reported by the Exodus sample was modelled. Within the Exodus sample, demographic characteristics were also modelled for their association with subjectively reported health status using logistic regression.

To determine whether there was a significant difference in the number of chronic illnesses reported using the open-ended and checklist-questioning techniques, Wilcoxon's Signed Rank test for paired data was used. Finally, the multi-faceted approach to measuring self-reported health status was completed by describing the proportion of respondents who rated better health as a high priority compared with other issues.

Results

The study response rate was 79% with 13/140 ineligible and 27/127 refusing to participate.

Subjective measurement of health status and its relationship to socio-economic and accommodation status

Table 1 illustrates that, compared with the general Sydney population, those in the Exodus community are more likely to be male, single, living in lower-standard accommodation, have left school at a younger age and to be unemployed. In particular, it shows a marked difference in the subjective measurement of health status between the Exodus and general Sydney samples. This difference was highly significant after adjusting for age and sex (p=0.0001), the Exodus sample having 4.5 times greater odds of fair or poor self-reported health than the general Sydney sample (OR 4.5, 95% CI 2.9-7.0).

Table 2 shows that *within* the Exodus sample, fair or poor health status was associated with accommodation status and age, but not with sex, ethnicity, recent unemployment, lower education level, smoking and marital status, possibly due to homogeneity of these variables in this sample.

Multivariate analysis showed the effect of accommodation status remained significant (p=0.02, adjusted OR 3.0, 95% CI 1.3-7.1) after adjusting for the effect of age (p=0.05, adjusted OR=1.4 per year, 95% CI 1.0-1.9).

Objective measurement of health status: the presence and patterns of illness

Using the presence of chronic illness as an indicator of poor health showed no difference between the two samples after adjusting for age and sex (p=0.64). This result was surprising given the large difference in self-reported fair-poor health. Similarly, a comparison of the prevalence of *multiple* (three or more)

Table 3: Relative frequency of 10 most common illnesses (acute or chronic) in Exodus and Sydney samples.

Exodus sample[a]		General NSW population[a]	
Illness type	**(%)**	**Illness type**	**(%)**
1. Other diseases of the digestive system (mainly liver disease)	32	1. Long and short sightedness	40
2. Total arthritis	26	2. Other eye disease	15
3. Common cold	24	3. Total arthritis	15
4. Hypertension	15	4. Headache	13
5. Depression	12	5. Hayfever	12
6. Bronchitis	11	6. Hypertension	12
7. Asthma	11	7. Sinusitis	11
8. Alcohol & drug dependence	7	8. Asthma	10
9. Long and short sightedness (refractive errors and disorders of accommodation)	6	9. Deafness	9
10. Diabetes mellitus type II	5	10. Common cold	8

Notes:
(a) Age and sex standardised to 1995 National Health Survey NSW population estimates using direct method.[33]

chronic illness in the two samples showed no significant difference (p=0.58). These outcomes were based on the combined results of open-ended and checklist question types.

Table 3 demonstrates, however, that the 10 most frequently reported illnesses in the Exodus community include more serious conditions than those for the general Sydney sample.

Table 4 reveals that comparisons by *disease type* for the 10 most commonly reported conditions in the Exodus sample, adjusted for age and sex, demonstrated markedly higher prevalence in the Exodus sample of: diseases of the digestive system (OR=5.4); depression (OR=13.2); common cold (OR=5.0); bronchitis (OR=2.9); alcohol and drug dependence (OR=19.4); diabetes mellitus type II (OR=6.8). There was also a notably significant under-reporting of refractive errors (OR=0.02), which was the most frequently reported chronic health condition in the general Sydney sample. The inclusion of mental illness in the checklist for this study resulted in one additional report of depression being made (i.e. an increase from 13 on the open-ended question to 14 cases). Four additional cases of liver disease were reported via the checklist (i.e. an increase from six to 10 cases).

Reporting behaviour and perceptions of unmet need

Reporting patterns in the Exodus community also indicated a tendency to under-report illness with open-ended questions compared with checklists (p<0.001). Twenty-six of 99 respondents reported more conditions when a checklist followed an open-ended question.

The Exodus sample also reported 'better health' as a high priority in their lives (38%), second only to 'financial security' (42%) and followed by 'improved housing' (20%).

Table 4: Odds ratios for 10 most prevalent conditions in Exodus sample relative to general Sydney sample adjusted for age and sex.[a]

Self-reported health condition/ disease	% with health condition in Exodus sample	% with health condition in Sydney sample	Adjusted Odds Ratio	95% CI	*p*-value
Most common health conditions					
1. Total arthritis	26	21	1.3	0.8-2.2	0.3
2. Other diseases of the digestive system	23	5	5.4	3.3-8.8	0.0001
3. Depression	24	2	13.2	7.5-23.3	0.0001
4. Hypertension	23	16	1.6	0.9-2.6	0.09
5. Common cold	17	4	5.0	2.9-8.8	0.0001
6. Bronchitis	13	5	2.9	1.6-5.3	0.0008
7. Long and short sightedness (refractive errors & disorder of accommodation)	10	64	0.02	0.01-0.04	0.0001
8. Asthma	10	6	1.4	0.7-2.8	0.3
9. Alcohol & drug dependence	9	0.6	19.4	8.7-43.0	0.0001
10. Diabetes mellitus type II	9	1	6.8	3.1-14.6	0.0001

Notes:
(a) Age ≥ 25 years.

Discussion

Although the aim of this study was to measure the self-reported health status of people who use the Exodus Foundation meals service, there are many similarities between this population and other seriously disadvantaged urban Australian communities that have been studied recently. A 1995-1996 Melbourne study of 284 homeless people[37] and a 1997 study of 210 homeless people in Sydney[34] both also reported that approximately four out of five participants were male. However, a recent survey of public housing tenants in the Hunter region of NSW reported an unadjusted analysis that tenants were more likely to be female and over 60 years old when compared with the general population of that area.[38] In the inner-Sydney study, 98% were single, similar to 93% in the Exodus study, while marital status was not reported in the Melbourne or Hunter studies. Melbourne and inner-Sydney reported a slightly lower mean age of 42 and 43 years respectively among their samples, which may reflect the inner urban rather than inner city location of the Exodus Foundation service. Smoking status was not reported by the inner-Sydney study, but the Melbourne sample were almost twice as likely (77%) to smoke as the Exodus sample (42%) and the Hunter sample (43.7%). Respiratory problems, heart disease, liver disease and peptic ulcer disease were reported as common among participants of most studies, with the exception of the Hunter study, which chose to look only at self-reported health status and risks. They report an unadjusted relative risk of 2.5 for self-reported fair-poor health (42%) compared with the general Hunter population, however the current study is the only one to measure age-sex adjusted self-reported health status and to compare prevalence of common conditions with that of the general population. The results of this study therefore, cannot necessarily be generalised to other seriously disadvantaged communities. Important issues about the measurement of health status within such communities, however, are highlighted by this paper.

Validity and potential sources of bias

The reliance on self-reported data to assess health status within this study was based on three factors. First, research on vulnerable populations such as the Exodus group requires methods that minimise intrusion and potential harm from the research process. Validating self-reports via laboratory investigations was deemed by the authors to have been too invasive for this study. Second, the use of standardised questions from the 1995 National Health Survey was aimed at ensuring internal validity of the instrument used. Third, while some may argue that the Exodus community may be less reliable in supplying self-reported data than the general population, this has been shown not to be the case in other studies.[39]

The inclusion of mental illness and liver disease in the checklist of health conditions prompted for in this study may have overestimated the odds ratios comparing prevalence with the general population for these conditions. However, their inclusion, is likely to have given a more accurate estimate of prevalence in the Exodus sample.

Accommodation, income and poor health

The strong relationship between self-reported poor/fair health and low income shown in this study is certainly consistent with other studies from the United States,[13,16] Canada[28] and United Kingdom.[19,20] Many of these studies have made adjustments in analysis for age, sex, ethnicity, income, education level and employment, but few have explored the relationship between accommodation standard and poor health. Given that the Exodus sample contains high proportions of many of these poverty-associated factors, it is an important finding that low accommodation status is the factor most strongly associated with poor health, even after adjustment for age. Many of the Exodus patrons interviewed during this study described living in low-quality, insecure boarding house establishments with inoperable kitchens and bathroom facilities shared by up to a dozen lodgers. Yet, such poor-quality inner city rooms come at a reasonably high financial price in comparison to welfare benefits. Further measurement of the relationship between accommodation standard and health status needs to be undertaken, particularly its association with disposable income. If the findings of this study are verified, strong advocacy by the health sector is required to improve housing standards and affordability within high-cost cities such as Sydney. More accurate recording of accommodation status in general population health surveys alongside income measurement may allow for a more detailed picture of this relationship to be built.

Patterns of disease and illness in the Exodus population

One of the most disturbing findings of this study is the striking difference in specific disease types between the Exodus and general Sydney populations. This pattern is consistent with a recent Australian report[25] that identified the increasing burden of disease for the lowest quintile of the Australian population relating mainly to diseases of the digestive system, injuries, diabetes, chronic respiratory disorders and mental disorders. These health problems, along with drug and alcohol dependence, appear to be some of the most significant areas for targeting health promotion and service delivery to more seriously disadvantaged communities such as the homeless. For example, it is extremely difficult for someone with non-insulin dependent diabetes living in a boarding house with poor kitchen and shared bathroom facilities to maintain appropriate diabetic diet and monitoring regimens. Similarly, mentally ill members of the community living in hostels and parks do not often connect with existing community mental health services. Given the size of the differences in some of these disease areas, greater efforts must be made to facilitate better prevention, diagnosis and management of these conditions for very disadvantaged groups.

Minimising under-reporting and identifying unmet needs

Ecological and contextual analyses will continue to be of

limited value unless more sophisticated measurements of the disease patterns experienced by disadvantaged groups are made. Open-ended question types should be supplemented by checklists, similar to those used in this study, to minimise under-reporting by lower socio-economic groups within the population. Indeed, the 1995 Australian National Health Survey[27] used a combined question strategy, however, its checklist was based on the most common conditions reported by the general population (e.g. refractive errors, arthritis, headache, hayfever). As this study has shown, such conditions are often displaced by more serious health and social needs in disadvantaged groups. If more accurate health differences are to be measured across socio-economic groups, such potential differences in reporting patterns need to be taken into account.

Albrecht[40] has raised the issue of under-reporting health status in patients with disability as a paradox. His suggestion that under-reporting by the disabled and disadvantaged may be part of their coping strategy amidst adversity, appears to be true in this case. In these circumstances, health professionals need to be aware of this propensity during their assessment and management of such clients. Similarly, researchers need to consider more targeted instruments to measure health status across socio-economic groupings. Despite this under-reporting, Exodus patrons identified improved health as one of the highest priorities in their lives, alongside financial security and better housing.

Conclusion

This cross-sectional study has raised a number of issues for those interested in measuring the health status of seriously disadvantaged populations. In addition to confirming marked health inequalities between the self-reported health status of patrons at a charity-run meals service and the general Sydney population, it points to a strong association between low accommodation status and poor health, with implications for future work in this area. It has also highlighted the fact that traditional national health survey instruments may well underestimate the size of inequalities in health between socio-economic groupings, particularly among the most seriously disadvantaged. Further testing of refined instruments across social groups should give a more complete picture of these inequalities. Significant differences appear to be attributable to higher prevalence of diabetes, mental illness, chronic respiratory disease and drug and alcohol dependence within the Exodus sample. Targeted health promotion and service facilitation via outreach services to seriously disadvantaged groups are worth testing and evaluating in such populations to address this significant problem.

Some of the most promising emerging models for service delivery in this field have resulted from the 1987 McKinney Homeless Assistance Act in the United States. Several demonstration projects were funded, tested and evaluated over the past decade with evidence of their effectiveness to improve outcomes in the homeless mentally ill. These proactive models engage marginalised, disadvantaged groups and provide basic support of food and shelter alongside healthcare, facilitating access to existing services and adherence to treatment via a transitional care model. Trials of such programs targeting other seriously disadvantaged groups may help to address the more serious patterns of illness demonstrated through studies such as these.

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