THE ECONOMIC STATUS AND HEALTH STATUS PROJECT

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Abstract

The increasing use of the Household Economic Survey for policy purposes raises issues about the assumptions that are used for transforming the unit records into aggregates that underpin the social policy analysis. This paper reports upon a Health Research Council-funded project to investigate the relationship between personal health status and economic status (especially location in the household distribution, but also in relation to other measures). The project uses unit records of the Household Economic Survey for 1994/5 – 1996/7 years when personal health status was recorded, using both objective and subjective measures. The paper explores some of the processing issues that the analysis is addressing.

INTRODUCTION[1]

Statistics New Zealand's Household Economic Survey (HES) is increasingly being used for purposes of social policy analysis, most notably for evaluating household distribution questions, including change in distribution over time. The transformation of the unit records into aggregates depends on certain assumptions that have developed over the last quarter of a century. Some of these assumptions have implications for social policy analysis that are discussed in this paper. Furthermore, the importance of the aggregate data for policy purposes requires there to be an evaluation of these assumptions. This is one of the tasks of a project funded by the Health Research Council (HRC) to evaluate the relationship between health status and economic status.

In the past research has been limited by access to the database, which has been either at a high level of aggregation or processed based on predetermined assumptions without

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[1] This paper is based on a presentation to the 1999 Conference of the New Zealand Statistical Association, Wellington, 5-7 July.

The authors would like to thank the following for their assistance in the project thus far: Rob Bowie, Paul Brown, Denise Brown, Len Cook, the HRC, Dean Hyslop, Sandra McDonald, Diane Macaskill, Claudio Michelini, Clare Salmond, John Scott, Helen Stott, and Alistair Woodward.

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much opportunity to interact with the data to improve the estimates[2]. As a result, a number of problems with the method have hardly been addressed. A research grant from the HRC is funding extensive use of the Statistics New Zealand Data Laboratory (SNZDL) giving the researchers direct access to HES data[3]. This offers the opportunity to deal with some of the past assumptions.

THE STANDARD MODEL[4]

The HES collects a variety of information on household status and economic activity, including household composition and before-tax market-plus-benefit incomes. Each record contains both household-wide information (such as household spending and housing status), and individual information on each member of the household such as personal characteristics and income received (which can be aggregated to provide household characteristics). Access to the SNZDL means that the project will be able to work with both sets of records.

The processing occurs as follows:

1. The after-tax (or disposable) income for each household can be calculated by applying known tax and abatement rates to individual records, and aggregating;

2. Household needs vary with household composition, including the number of people in the household and their ages. Aggregate household income is scaled to reflect this composition. Rather than use a simple per capita measure, a household equivalence index allows for economies of scale and the lower relative needs of children; and

3. The resulting ratio is called "household equivalent income" (HEI). The households are ranked in order of their HEI, and either divided into quantiles or partitioned by a poverty line (or lines).

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[2] Quasi-unit Records, which are averages of three observations stratified by household type, tenure and income are available for the 1995 year. Indications are they behave sufficiently like unit records for many purposes, and some of the results reported below use them. They are available from Brian Easton, and while there are some restrictions upon their use, they will be no complication for a serious researcher.

[3] Any results presented in this study are the work of the authors, not Statistics New Zealand. Access to the data used in this study was provided by Statistics New Zealand in a secure environment designed to give effect to the confidentiality provisions of the Statistics Act 1975.

[4] For a more extensive account of the model see Easton (1991).

The resulting estimates have been widely used. They are the primary database for the debate on whether poverty has increased or decreased, and for the current discussion on income shares, which acknowledges that while the top decile has experienced a rise in its standard of living over the last 15 years, the bottom eight deciles have not (see Easton 1999).

SOME STATISTICAL ISSUES

Various conceptual issues complicate the standard model, including the question of the extent to which income can be considered a measure of welfare. There is also a debate about the correct poverty line. In this paper we focus on the statistical issues and steps taken to resolve them. These are listed below. We also discuss the implications of these issues for social policy analysis (Easton 1997b). *(The policy-related comments are in italics.)*

1. A minor, but frequently overlooked problem is that the data are often reported on a household basis. But since households have varying numbers of members, and because large households tend to be poorer, the proportion of households below any poverty line is less than the proportion of people in poverty. *The analyst needs to check whether the data are presented by households or people.*

2. Note also that the HES data are often reported in terms of years to March. This covers all the respondents in the period April of the preceding year to the March-identified year. Because respondents are asked to report retrospectively on their preceding year's expenditure, the income data actually reflect more closely the period for the September year preceding the March year. Thus, March-1999-year income data would be better attributed to the September 1998 year. This becomes important where there are income comparisons or where price deflation occurs. *The data published in the recent edition of* "New Zealand Now: Incomes 1998" *by Statistics New Zealand allow for this (Statistics New Zealand 1999), but some of the earlier researchers do not. Unless there is an explicit mention of the time period issue it is probably sensible to assume the adjustment has not been made. This does not affect distributional shares over time, but without adjustment real income changes and timing of changes in real and nominal income levels may be wrong, although the long-run comparisons may be relatively reliable.*

3. It turns out that incomes reported in the HES are inaccurate, probably to the extent of being 20% lower than accurate measures of income. Statistics New Zealand is reviewing this inaccuracy. An important issue is whether the error has drifted over time (or even suffered a major change in the mid-1980s when benefit incomes were grossed up to a before-tax level and then taxed). *Absolute levels may be incorrect, although changes over time may be more reliable* (Easton 1997a).

4. The results are sensitive to the choice of Household Equivalence Scale. A number are available, some based on a priori arguments, some on econometric estimation (at various levels of sophistication). The most popularly used, the Jensen 1988 scale (based on a priori assumptions), may be extreme compared to the other available ones, giving lowest poverty levels (especially among children) (Easton 1997a). One issue is the extent to which the scales change over time, perhaps as a consequence of relative price changes, especially the increased use of user charging for health services, education and housing which affects different household compositions and different positions in the income distribution (as when the user charging is income tested). *The study has done some preliminary work (in draft publication) which suggests that the distribution in general, and the location of some social groups in particular, may be very sensitive to the choice of equivalence scale, among the ones currently available. Claudio Michelini (with Srikanta Chatterjee) has been econometrically estimating new equivalence scales (1998). While not yet having been used in the standard household model, preliminary indications are that they are of higher quality than those currently available.*

5. Housing circumstances matter. The standard model treats those who own their own homes (with or without a mortgage) and those who are renting (at market or subsidised rents) as all having exactly the same spending power with their reported income. One approach to addressing this issue has been to deduct household spending on housing from disposable income. Not only does the resulting hybrid of income and expenditure indicate this method is conceptually wrong, but there also needs to be a resulting adjustment to the equivalence scales. A rigorous way may be to impute "normal" household spending on housing (based on housing characteristics and market income), and treat the net difference between imputed and actual housing spending as imputed income. This has yet to be done systematically. *At this stage all the social policy analyst can do is be cautious. It seems likely that not adjusting for housing on average raises the incomes of households with children compared to those without, and lowers the relative incomes of the elderly who tend to own their own housing without mortgage.*

6. A related problem exists for spending on education and health. For instance, a household with disability or illness may have medical outlays that a well household does not. The problem is not as large on average as for housing, and therefore probably not as acute across all households. It may be very important, though, to the sick. *Again the only current counsel is caution in choice of equivalence scale and making comparisons through time, especially where policy changes have affected private outlays on educational and health services.*

There is, however, a deeper problem behind these statistics for the social policy analyst. What do they actually mean? So what, if we are told that such and such a percentage of the population are in poverty?

What we really want with poverty measures is to be able to relate certain sorts of behavioural consequences – like the extent to which sickness and poverty are linked. While there are limitations from the essentially cross-sectional data of the HES, the inclusion of health status questions in some surveys means some progress is possible. A basic research technique is to contrast those who are well with those who are unwell. For example, suppose there is enough information on personal characteristics to make it possible to predict each well person's income and expenditure. The personal characteristics of each sick person can then be used to predict their income and expenditure as if they were well. The differences can be used to indicate to what extent the unhealthy person's living standards are depressed by poor health. The remainder of this paper describes how this might be done with the existing data.

HEALTH STATUS AND THE HES QUESTIONNAIRE

For the three years between 1994/95 and 1996/97 health questions were asked in addition to the standard HES questions. Some of the information collected for all household members, including children, about their use of the following health services over the preceding 12-month period, is essentially "objective":

- Accident and emergency services at a hospital;
- Other hospital services such as outpatient clinic, hospital pharmacies, laboratories or day wards;
- An ambulance;
- Nights spent in a hospital as a patient;
- Nights spent in a nursing home or similar;
- Length of time since visiting a GP;
- Number of visits to a GP or family doctor, nurse, medical specialist or consultant, chemist or pharmacist, optician or optometrist or other medical personnel; and
- Medical support services such as laboratories, X-ray clinics or health caravans.

The health supplement also included a "subjective question":

- In general, how would you rate your health?

with response options of "Excellent", "Good", "Not so good" and "Poor".

Additionally, household members were asked whether they had medical insurance, a Community Services Card or a High Use Health Card.

CONSTRUCTING HEALTH STATUS INDEXES

The first step in exploring the relationship between health status and socio-economic status will be to construct an overall measure of utilised health services for each individual. An econometric equation based on reported use of health services as independent regressors is used to predict the self-reported (subjective) health status (that is, the dependent variable in the regression). In effect, the equation aggregates the reports of health service usage into an index that reflects the subjective status of those with that pattern of utilisation. We call this the index of health service utilisation. The utilised health services index may be treated as a measure of health status, given the way it is constructed. However, it may not be a true objective health status variable because utilisation may be influenced by socio-economic factors independent of health, such as income, medical insurance, the Community Services Card or other factors that affect access to health services.

The utilised health service index will be calculated by way of a regression procedure with the measures of health service use as independent variables and the subjective health measure as the dependent variable. Currently, principal component analysis is being used to reduce the data set of health usage to a few variables.

The health service measures that best predict subjective health status should be identifiable. It may be that a combination of several simple utilised health service measures is a good predictor of subjective health status. The predictors are likely to differ by gender and age.

The utilised health service index and subjective health status of each household member will be combined into a household health status index, which can be compared with the household economic status using such measures as household equivalent income, housing status, material consumption, and employment status of household members.

EVALUATING HEALTH STATUS AND ECONOMIC STATUS

The subjective and aggregate utilised health service index will enable the researchers to investigate such questions as:

- To what extent do poorer households have poorer health, and those with poorer health live in poorer households?
- Does health related spending differ between different income groups when controlled for health status?
- What is the relationship between housing status and health status, when controlled for income?
- Are there any specific issues relating to children's health and income?

- Do the unemployed have different health status from other groups, when income is controlled for?
- What is the effect of non-household health funding (such as medical insurance or the Community Services Card) on health spending?
- How effective is the Community Services Card? How successfully is it targeted?
- What is the impact of medical insurance on private health service spending and on health service utilisation?
- Are there differences in spending patterns on other commodities (such as food) between households with different health statuses?

CONCLUSION

Inevitably there are limitations to interpreting the data. Suppose we observe a concentration of those with poor health among those with lowest incomes. That does not tell causality. It may be the unhealthy become poor, or it may be that the poor become unhealthy. Probably it is a bit of both. Even so, the project will add to knowledge of where the unhealthy are located in the income distribution, in the housing-tenure spectrum, and in the source-of-income spectrum. The study cannot resolve all the questions about health status and economic status. Its more modest objective is to use the HES to make some progress by providing some of the answers.

While social policy analysts, especially those concerned with health and socio-economic status, may await with interest these research outcomes, they should also be cautious when using the existing research, given the problems of data transformation that are identified here but still unresolved.

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