

Multidimensional Measures of Living Conditions Including Disability Indicators

Non Autosufficienza e Misure Multidimensionali delle Condizioni di Vita

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Riassunto: Un aspetto che spesso viene trascurato nell'analisi delle condizioni di vita è la presenza o meno di persone non autosufficienti in famiglia. Ciò deriva sia dalla scarsa presenza di informazioni utili al riguardo nelle usuali *budget surveys*, sia ad alcune difficoltà nel definire misure di disagio indotte dalla presenza di persone non autosufficienti in famiglia. Il lavoro, sfruttando le informazioni prodotte dall'indagine campionaria "Indagine sulle Condizioni di Vita delle Famiglie Toscane" (ICVFT, anno 2002), si propone di verificare se, e come, tale componente di disagio si relaziona ad altre forme di deprivazione non monetarie.

Keywords: disability indicators, multidimensional poverty measures.

1. Introduction

A comprehensive picture of living conditions can be obtained by considering not only the monetary dimension, but also non-monetary dimensions such as basic lifestyle deprivation, secondary lifestyle deprivation, housing facilities, housing deterioration, environmental problems (European Commission, 2002). A dimension hitherto unconsidered relates to *disabled and special-need persons living in households*. This aspect is already of concern to a large proportion of households, and is likely to grow. In the past the caring role was assigned to "non-working" members of the household, and the community was quite rich in persons with this kind of role. Now care-giving has become a "real" and remunerated job; in this new context, the household monetary sources and the availability of care service will become more and more critical factors. The indicators describing living conditions should take into account this aspect.

2. Data and indicators of lifestyle deprivation

The data analysis is based on the sample survey ICVFT (details about the survey are in Ghellini and Neri, 2005). The primary focus of the survey is the collection of information on income and living conditions of the Tuscany households. The survey provides information on deprivation and social exclusion, and a whole section of the questionnaire is devoted to disabled people. The resulting dataset provides a great

number of indicators, collected on the 2625 interviewed households. The indicators can be classified according to the following categories: 1) population register-type information about each member of the household; 2) housing conditions and durable goods; 3) respondents' perceptions of their living conditions; 4) indicators on the original family of the head of household; 5) existence of disable individuals that need care and/or assistance, irrespective of the household membership (the database contains several indicators about the kind of disability, specially whether it is age-related, about the nature of care or assistance that is needed, as well as about monetary aspects related to disability); 6) information about earning members of the household concerning their general opinions, habits, work conditions and income.

Regarding the disability phenomenon, official sources (Istat, 2002) report that at national level 11% of the households have at least one member affected by disability. According to our sample survey data, the percentage of families with disable individuals is about 20%. This value is higher than the one provided by the above mentioned official source, because in our computation the families that take care or give assistance to relatives that are not household members are also included. Some other interesting remarks on disability, outlined by the ICVFT are the following: 17% of the households have a relative that needs care and/or assistance; 3% have at least two relatives with this kind of problem. A third of the disable persons have age-related problems (in fact one half of this group is over 80 years old; see Pescarolo, 2005).

The whole set of indicators collected are individually relevant for the analysis. However, it is also relevant to investigate how these indicators cluster together to form conceptually and empirically distinct dimension of lifestyle deprivation and social exclusion. Several studies based on the European Community Household Panel suggest not only that distinct dimensions of deprivation exist, but that these are differentially related to income (Whelan *et al.*, 2001; Betti *et al.*, 1998). Traditionally, household income or expenditure are the standard measures in poverty and living condition analysis, however, the standard of living of households and persons can also be described by a host of other indicators. The items included in the analysis, recoded as categorical variables assuming increasing values as the deprivation increases, and clustered according to several of the topics listed above, are the following: *Disability Problems* (cause of disability, hours of care/assistance, nursing home, payments for care/assistance); *Housing Facilities* (availability of heating system, indoor flushing toilet, bath or shower, hot running water, air conditioning, terrace/garden, garage); *Durable Goods* (use of car or van, motorcycle, washing machine, refrigerator, dishwasher, micro wave oven, colour TV, video recorder, satellite parabola, hi-fi system, personal computer, internet connection, mobile phone); *Housing Problems* (home not adequately warm, rot in window frames/floors, leaky roof/humidity, difficult access, dwelling too dark, noise, shortage of space).

The special feature of the analysis reported here is the introduction of the new dimension related to *the presence of persons who need care and assistance*.

3. The analysis

To define clusters of indicators, with the aim to identify underlying dimensions is not an easy task. For this reason, we have used here an exploratory and confirmatory factor analysis for defining the underlying dimensions of deprivation. All the indicators listed

in the previous section have been included in an explorative, followed by a confirmatory, factor analysis.

A preliminary analysis, performed by *excluding* the items related to *Disability Problems*, produced three factors: the first concerning possession of durable goods, the second representing secondary housing services and housing deterioration, the third regarding basic housing services. In the following analysis the three dimensions will be named respectively: *Durables*, *Housing Secondary*, *Housing Basic*.

The following explorative and confirmatory factor analysis are performed. These include indicators related to age problems and disability. The factors are extracted using the principal components method; the best results are obtained through an oblique rotation of the resultant four dimensions. The explorative factor analysis has produced a simple solution (indicators with high loading scores in only one factor and next to zero in the others). Out of 33, 23 items are selected, and the percentage of common variance explained by the presence of the latent dimensions is about 55%.

The factors are easily interpretable. They present the same structure as the previous analysis, plus a new factor related to the presence of people with disability and age problems in the household. Henceforth, we refer to this dimension as *Disability*.

The confirmatory factor analysis results confirms the predictions of the explorative analysis. The fit of the four-factors oblique solution are evaluated through the goodness of fitness indices, obtaining GFI=0.94 and the adjusted index AGFI=0.92 (Joreskog *et al.*, 1985), showing a remarkable fit of the model. The next step is to combine individual indicators into a single summary index of non-monetary deprivation, in order to investigate the extent to which measure including and not including the *Disability* dimension differ. This step has been performed by computing fuzzy deprivation measures (Cheli *et al.*, 1995). We use the name FDM (Fuzzy Deprivation Measure) to refer to the measure constructed without considering the disability indicators; and AFDM (Alternative Fuzzy Deprivation Measure) for the new measure incorporating the disability indicators.

Figure 1: *AFDM vs FDM according to age and gender*



In order to make clearer the comparisons between the two measures, the AFDM measure has been rescaled to have the same mean value as the FDM measure. The two indices are then represented like index numbers, where the base (equal to 100) corresponds to the two mean values coinciding. The AFDM index has been analyzed according to several classification variables such as education level, employment status of the head of the family, family size, age and gender of the head of household (see

Figure 1). In general, the AFDM lies rather close to the mean value (100) for different age-sex categories. This result leads to the conclusion that the *Disability* dimension makes the AFDM index flatter, compared to FDM where this dimension is not considered. The result is in agreement with the preliminary descriptive analysis: disability-and-age-related problems are almost equally distributed through homogenous observation groups. Nevertheless, it is very important to note the changed pattern due to the introduction of the new dimension. According to FDM the membership function of the set of “the poor” is like a parabola having a minimum at 35-45 years of age. In the corresponding AFDM measure, the parabola is very flat, has a minimum between ages 45 and 65, and the slope of the parabola is steeper for young than for old people. In brief, the introduction of the *Disability* dimension seems to show a transfer of the discomfort status from the old to the rising generation.

4. Final Remarks

Two kinds of conclusion can be drawn from the above results. Firstly, the analysis brings out the importance of constructing separate indices for different dimensions, rather than combining them all into a single index. Secondly, the analysis points to the necessity of detecting indicators able to reflect aspects of the “discomfort” which households with disable persons face: possible indicators to consider may include opportunity costs regarding leisure time and opportunity of working. Further research may address the question as to how and how much the Disability dimension affects subjective deprivation.

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