The wellbeing of the elderly

Approaches to multidimensional assessment

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NOTE

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PREFACE

In which way should the World Health Organization support health researchers who are planning studies on aging? This was a question considered by a distinguished body of scientists that advises the Organization on its research activities. In the view of these scientific advisers, social and health policies need to be derived from social surveys and epidemiological research conducted on samples drawn from the population. Two of these recommendations were that survey instruments should be reviewed and the standardized assessment of function of elderly people promoted. The present publication constitutes a response to these recommendations.

A WHO Scientific Group on the Epidemiology of Aging, a which reviewed this book, proposed that it should have wide circulation because of the practical guidance it gives to those planning policy-oriented studies, which are expected to proliferate in the 1990s as countries begin to think about the provision of appropriate care for the fastest growing segment of the population - the elderly. Such studies are already beginning in countries of the WHO Regions and of the Americas, South-east Asia, Europe and the Western Pacific, stimulated by the United Nations World Assembly on Aging held in Vienna in 1982, which recommended, inter alia, "the gathering of data on the physical, mental and social profiles of aging individuals in various social and cultural contexts in order to provide a sound basis for future actions".

There have been few attempts to make a comprehensive assessment of the wellbeing of representative groups of elderly people as a basis for policy decisions concerning the provision of appropriate services. Rather than considering the elderly person as an integral human being, the tendency of care givers and research workers alike has been to measure single dimensions of wellbeing, such as mental function, social support, economic status, physical morbidity or capacity for self-care. However, elderly people are subject to multiple disadvantages, and their physical, mental, social and economic wellbeing are closely interrelated - more so than at younger ages - so that combined assessment of the various dimensions of wellbeing is necessary.

There is a general consensus that five basic dimensions should be included in any overall assessment of elderly individuals within a population - namely, activities of daily living, mental health, physical health, and social and economic functioning.

Assessment of activities of daily living - perhaps the most important area - measures as a composite index the individual's ability to perform such functions as bathing, dressing, getting to the toilet, transferring, keeping continent and feeding. These six basic activities are occasionally extended to include others, such as climbing stairs, cooking and cleaning.

Assessment of mental health is a crucial element of overall assessment, both because of its interrelationship with social functioning and because of the need for specific services in cases of mental illness, but its measurement is much less standardized and there are many instruments, b often derived from psychiatric diagnostic procedures. The most commonly used questionnaires seek to identify the presence and extent of "organic disease" (leaving more definitive diagnosis to subsequent clinical examination), symptomatology, which could indicate psychiatric disorder, and some personal assessment of mental wellbeing.

Most questionnaires on physical health contain a list of symptoms (do you have a cough, do you have a pain in the chest, etc.) and inquire about illness, use of medicines, restrictions on activity and use of health services in the recent past. On the whole, such self-assessment of physical health, at least in population-based surveys, correlates well with "objective" estimates of health status and the use of services.

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Social health is a measure of family or other interpersonal links and involvement in the community, the four areas assessed being family and home (marital status, contact with relatives), friendships, relations with community organizations and work.

The aim of measuring economic status is to assess whether income, from whatever source, is adequate for the elderly person's needs.

Beyond these five dimensions, other assessments can be made; for example, a WHO sociomedical survey of the elderly\(^a\) measured adequacy of housing and use of recreational activities.

Dr Fillenbaum has systematically reviewed 14 survey instruments that have been used in different continents to assess the function of elderly people, in the comprehensive sense described above. Her study is designed to help health and social researchers to select an instrument appropriate to their use. The assessment of wellbeing cannot be more trustworthy than the instruments used. Any questionnaire therefore needs to be examined with a view to finding out whether it really measures what it purports to measure (is it valid?) and whether the measure yields the same results on repetition (is it reliable?). This study discusses various aspects of validity and reliability. Dr Fillenbaum offers a word of caution about overconcentration on the questions posed to the neglect of the subsequent analysis. Thus, the reader is presented with a balanced guide extending over the whole range of scientific endeavour from conceptualization to policy implications.

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\(^a\) Heikkinen, E. et al. The elderly in eleven countries: a sociomedical survey. Copenhagen, WHO Regional Office for Europe, 1983 (Public Health in Europe, No. 21).
OVERVIEW

If resources intended to improve public welfare are to be applied effectively, it is vital that accurate and relevant information on the population at issue should be available.

This matter is of particular importance where older persons, often largely dependent on others, are concerned; this segment of the population has been growing worldwide and is projected to expand further. It is therefore not surprising that for some time there has been concern with assessing the status of the elderly, and that ways of doing so have been developed. These approaches typically involve the use of structured or semistructured questionnaires to gather information relevant to determining functional status, for it is functional status, rather than diagnosis, which indicates whether an older person can live an independent and fulfilling life.

The present publication will discuss briefly why functional assessment - in particular, a multidimensional approach - is preferred. Several multidimensional functional assessment questionnaires have been developed. The major bases for the development of such questionnaires will be indicated, their psychometric properties referred to, and the more important of them briefly described. Since interest lies in standardized approaches that are designed to permit assessment of the functional status of the entire population of the elderly, both the minority living in institutions and the majority living in the community, assessments relevant only to an institutional setting will not be included.

In addition to considering multidimensional functional assessment questionnaires, separate attention will be paid to each of the areas typically included in such questionnaires, i.e. to activities of daily living (ADL), mental and physical health, and the social and economic spheres. For each area, we shall indicate the kinds of information typically gathered, discuss their relative usefulness, and describe alternative ways in which information is summarized. Because of its importance to the wellbeing of the older person, attention will also be paid to environmental measurement, and, since the family constitutes a very significant provider of services, brief mention will be made of its role.

Although the main concern here is to assess the functional status of the older person, it is important to recognize that assessment does not, or certainly should not, occur in vacuo. Rather, the results are intended to guide policy. Since that policy will typically become translated into services, we have considered it appropriate to include a section, albeit very brief, on services and their definition (section 2.9).

We hope that the more detailed information included here will result in an awareness of alternative types of information and the ways of obtaining it and so help users to select an instrument appropriate to their purpose.

Although much effort goes into the construction of an assessment questionnaire, comparatively little concern has been paid to summarizing and analysing the resulting information. Since the experience of others may well prove useful in this regard, several model studies, each of which has focused on functional capacity and developed a policy-relevant functional classification system, will be presented.

Two further matters are also of importance and are discussed here: an understanding of the standards of validity and reliability that assessment techniques should meet and issues related to the gathering, preparation, analysis and reporting of information.
INTRODUCTION

This publication is intended specifically for those who are concerned that policy formulation regarding the elderly should rest on a secure and rational basis. Our aim is to provide policy-makers with a guide to determine what information they need in order to assess the older members of their population, to demonstrate the ways in which such information may be analysed, and to indicate some of the problems and difficulties that arise in this process and some of the decisions that have to be made.

Few countries use the resources necessary (if, indeed, they possess them) to obtain sound policy-relevant information on the status of all the older members of their populations. Even fewer have tried to assess the overall personal impact of policy-related interventions. Rather, instead of considering the person as a whole unified being, the tendency has been to examine in isolation aspects such as economic status, or health condition, or factors related to the utilization of health resources. Such an approach is not fully informative. People are complex integrated wholes, and both assessment of the individual and assessment of the impact of policy must be prepared to take this into account. It is for this reason that multidimensional assessment is preferred.

While it is necessary and important to have information on specific areas, functioning in one area has an impact on functioning in others. Economic status, social wellbeing, and mental and physical health are interconnected, the relationships between them becoming closer as age increases (see, for example, 2, 3, 5, 14, 26, 43, 54, 77, 92, 116, 123).

Comparison of theoretical (e.g. 69), empirical (e.g. 21) and conceptual approaches (e.g. 49) indicates that there is a kernel of agreement on what should be included in something as ambitious as an overall assessment. That kernel includes three areas: activities of daily living, mental health and physical health. In addition, the social and economic domains are sometimes also treated as areas of personal functioning and are measured because of their importance as part of the environment in which people live and are expected to function. These five areas (which are sometimes further subdivided) are the main areas included in multidimensional assessments. When the results of the assessment are intended for service-related purposes, the surroundings in which the person lives and the nonprofessional service providers who give help, i.e. family, friends and neighbours, are also studied.

There is a general consensus of opinion that, particularly where the elderly are concerned, assessment not only should be multidimensional, but also should be in terms of functional status. That is, it should show the adequacy with which a person performs or, in some cases, is capable of performing. As Jones (56) points out, the elderly in particular tend to suffer from multiple chronic conditions. Concern is not with cure but rather with maintaining functional independence, and consequently this is what needs to be measured. Obviously, accurate information on diagnosis is important, but there is little relationship between diagnosis and functional capacity. Those with the same diagnosis vary with respect to the manifestation of the disease, the course of the illness, the severity of the symptoms and the resulting disability. Diagnosis does not adequately identify people with similar needs for care. Classification in terms of functional capacity is much more useful in this respect.

Our concern is with multidimensional functional assessment of the population using procedures which are valid and reliable, which permit assessment of all the members of the older population, both within the community and in institutional settings, and which are suitable for assessment and reassessment. Consequently we shall not deal here with measures appropriate only for institutional use. Good critical reviews of these are available elsewhere (43, 47, 59, 78, 79).

In addition to multidimensional functional assessments of known validity and reliability, there are two further types of measures of interest that will be considered: multidimensional functional assessments whose validity and reliability have not been examined but which may well provide valid and reliable information, and questionnaires which are intended for other purposes but which, because of their breadth of inquiry, may nevertheless provide suitable information. Since the latter type may permit the use of already available data (so that a special survey with all its attendant costs in time and money need not be carried out), we shall give an example of how information from such a questionnaire can provide valid data on functional status.
The number of multidimensional assessment measures which are specifically designed to assess functional status in the total older population and which meet acceptable standards of validity and reliability (indeed, in which there has been any concern to establish validity and reliability) is small. While mentioning several, we shall focus on three: comprehensive assessment and referral evaluation (CARE) (38), Philadelphia Geriatric Center multilevel assessment instrument (MAI) (68), and Older Americans Resources and Services (OARS) multidimensional functional assessment questionnaire (21). The International Classification of Impairments, Disabilities and Handicaps (ICIDH) (49) will also be mentioned, since it represents an important conceptualization of overall functioning, and attempts are now being made to put it into effect.

We shall first briefly describe multidimensional functional assessment questionnaires of established validity and reliability and then turn to some other multidimensional assessments which do not meet these criteria but which are of particular interest. Following this, each of the areas relevant to a multidimensional assessment will be considered, including the content and alternative ways of gathering data.

As indicated above, three multidimensional functional assessment questionnaires are of particular relevance: CARE, MAI and OARS. While only cursory attention is paid to them in section 1, each is described later.

For assessment to be useful, it is crucial not only to have an appropriate measure but also to obtain, analyze and present that information in ways which will maximize the likelihood that policy based on it will be accepted. We try to deal with some of these issues in section 4.
Comprehensive assessment and referral evaluation (CARE) (38)

CARE is a semistructured interview guide developed to assess community residents over 65 years of age and used in particular for cross-national comparison of random samples each of about 500 older persons in New York and London (37).

While its primary focus is psychiatric assessment, it also covers medical, nutritional, economic, social and environmental (housing) problems. Only limited service information is gathered. Items in the various areas are intercalated and their diagnostic intent is sometimes concealed in order to ensure an unalarming interview. As far as possible, information is obtained from the respondent; if he or she cannot reply to questions, a knowledgeable informant is asked to supply the requisite answers. Observational data are obtained from the interviewer.

CARE provides three main types of summary measure:

(1) dichotomous scales of "caseness", i.e. whether or not the respondent can be considered a psychiatric case;

(2) diagnoses of certain mental and physical conditions;

(3) global assessments.

Five global assessments, each on a 10-point scale, are made in each of three basic areas: psychiatric, medical and social. These global assessments refer to symptom severity, risk, and whether intervention is requested, given or needed. In addition, the negative aspects of the following are rated: general distress, impaired performance, strain on others, danger to self and extent of life stress in the past year.

Further ratings, again each on a 10-point scale, are made of several negative syndromes (seven psychiatric, four medical and nine in the social area). Positive syndromes are also considered, three in the psychiatric, one in the physical and two in the social area.

Specific rating guides are provided, and there are also guides for reducing the 10-point scales into fewer categories (typically three levels of malfunctioning). The length of time it takes to make these ratings has not been indicated. At a clinical level, such detailed information is useful, but it is probably less necessary at a population level.

Decisions are also made regarding the presence or absence of a problem in the psychiatric, medical, social and nutritional areas and, if a problem exists, whether formal and/or informal help is received and whether that help is adequate.

Although the questionnaire was developed for community residents, an adaptation suitable for use in institutions has been constructed (IN-CARE).

Administration time averages 90 minutes, but may vary considerably. The emphasis is on making the interview comfortable for the interviewee, and the interviewer must be prepared to gather accurate information on the selected topics in the order directed by the person interviewed and not necessarily in the order of the interview schedule. Consequently, the training of interviewers is lengthy (about a month).

The psychiatric items selected for CARE were based on standardized valid and reliable schedules and were further modified until a best set was obtained. Physical health items and many items in the social segment were also selected from standardized sources. Thus, such items have the validity of the parent instruments. Early work indicated that, with training, it was possible to obtain substantial inter-rater reliability in the three areas examined and across different disciplinary backgrounds. This work provided the basis for further refinement of the scoring procedure, so that inter-rater reliability is now probably better than that originally reported (38). Further studies of reliability and validity are in progress.

Philadelphia Geriatric Center multilevel assessment instrument (MAI) (68)

The MAI is built on Lawton's (66, 67) conceptual model of the wellbeing of older people. Four major multidimensional sectors are considered important in assessing wellbeing: behavioural competence, psychological wellbeing, perceived quality of life and
environmental quality. Information is gathered in seven domains related to these sectors. These domains and their statistically determined subindices (in parentheses) are:

- physical health (self-rated health, health behaviour, health conditions, health aid);
- cognitive (mental status, cognitive symptoms);
- activities of daily living (physical self-maintenance, instrumental);
- time use (activity);
- personal adjustment (morale, psychiatric symptoms);
- social interaction (interaction with friends, interaction with relatives, other clinically relevant items);
- perceived environment (housing quality, neighbourhood quality, personal security).

In addition, basic demographic data and summary information on income are sought. Domain and subindex scores can be calculated. The questionnaire is structured. If the respondent is incapable of answering, informant data can be used. The MAI has been used with different types of community residents, including those on an institution waiting list. It is probably appropriate to the entire range of elderly people.

Careful attention has been paid to determining the psychometric characteristics of each of the domains examined and to assessing reliability (internal consistency, test-retest) and validity (internal, criterion). Administration time for the MAI is about 45 minutes. A manual is in preparation. As is typical, training in administration of the questionnaire seems preferred. The MAI has an interesting property: not only is it legitimate to take sections out of context, but since, on occasion, time is of great concern, there are guides to selecting specific items so that a medium- or short-length questionnaire can be used. In most domains, however, the full-length version is statistically preferable.

Older Americans Resources and Services (OARS) multidimensional functional assessment questionnaire (21)

The OARS questionnaire was developed in order to put into operation a programme evaluation and resource allocation model.

The questionnaire consists of two independent parts. Part A permits the assessment of functional status in each of five areas (social, economic, mental and physical health and activities of daily living). The responses to the items in each area are summarized on a 6-point scale (1 = level of functioning excellent, 6 = totally impaired). Part B is a services assessment that directs inquiry into 24 generically defined services, determining for each: current use, extent of use in the past six months, category of provider, and current perceived need. In addition, there is a demographic section. The questionnaire is structured. Information is sought from the respondent, but in the case of respondent incapacity, information is obtained from an informant. Interviewer evaluations are included.

The OARS questionnaire has been designed for use with both community-based and institutionalized adults aged 18 and over, but typically is used with persons over 55. When used with the institutionalized, some items are omitted, minor changes in the wording of other items are necessary and institution-relevant questions are added. Administration time averages 45 minutes for community residents (a little longer for those who are more impaired).

Although the questionnaire is simple and straightforward and its administration is detailed in a manual, training is recommended; this takes two days. Validity (content, criterion, concurrent and construct - see section 4.1) and reliability (inter- and intra-rater, test-retest) have been, and continue to be, examined (21, 30, 31). Work to computerize the summary ratings, which are currently made by interviewers based on responses to questions, is in progress (33).

The OARS questionnaire has been used in Australia and is widely used across the United States, special surveys having been done of American Indians and Spanish-speaking people. Two translations into Spanish are available.
Data from major OARS-based surveys have been used for the evaluation, planning and estimation of service requirements and related costs at the local, state and national levels (e.g. 46, 105, 112). These and other OARS-based survey data are readily accessible for purposes of comparison, since they are maintained in the Data Archive for Aging and Adult Development, Center for the Study of Aging and Human Development, Duke University, Durham, NC 27710, USA.

**Kilsyth questionnaire (82)**

The Kilsyth questionnaire is an assessment intended for use by a health visitor (community nurse), and it capitalizes on the expertise of such an interviewer.

With the exception of the economic area, information is obtained in all the main areas of functioning. The manner of gathering information includes unstructured, semistructured and structured approaches and varies according to area. The questionnaire is not complete and needs to be used with the summary record form.

The following information is gathered (the manner of obtaining information is indicated in parentheses and sometimes has had to be estimated): demographic (unstructured); social contacts (unstructured); adequacy of housing (unstructured) and presence of accident hazards in the house (semistructured); physical and instrumental ADL items (unstructured), for each of which the interviewer must determine the amount of help required (if any), the nature of the provider, the reliability of the help received, and the continuity of its provision; mobility (semistructured, observational); diagnoses and current treatment (obtained from best source, e.g. medical records); drugs and related problems (structured plus interviewer assessment); service use (semistructured); feet, eyes, hearing, teeth (semistructured plus examination, subjective assessment); 43 physical-symptom groups (structured plus examination, observation); mental health (structured, observation); and nutrition (structured).

Criterion-based validity (comparison of health visitor assessments with those made by a geriatrician after personal examination) showed substantial agreement on specific physical health matters and on the presence or absence of mental health problems. Reliability was not assessed and may vary from one health visitor to another.

On average, this questionnaire takes 45 minutes to administer. It was developed for, and has only been used with, elderly community-based residents. Its applicability to those in institutions is not known, but it would also seem to be usable in that context.

For each area, the information obtained is summarized to indicate whether a problem exists. The questionnaire can then be consulted to determine the specific nature of the problem.

As it stands, this questionnaire is probably unsuitable for populational assessment since so much is left unspecified. Users would have to come to an agreement on what is meant by social contact, what is implied by cooking facilities, what constitutes an examination of the feet, how to assess an irregular pulse, and so on.

Note should, however, be taken of the fact that this questionnaire covers most areas of functioning (only economic status is excluded), that it summarizes information in a straightforward manner, that it is concerned with establishing the adequacy and anticipated duration of available help, and that it does inquire about receipt of publicly provided services, albeit a very limited set. In addition, there seems to be an implicit assumption that the interviewer will also use the interview to provide the respondent with information that may facilitate independent living, improve functional status or result in the receipt of appropriate care. At some stage, most surveys have to face the issue of how, whether and under what conditions to offer help to respondents. Because health professionals were used in this study and local area physicians were closely involved, and because the impact of intervention was not being assessed, it was possible to make service recommendations.

**RAND health insurance study (RAND HIS) questionnaire (12)**

The RAND HIS is a multidimensional functional assessment questionnaire developed in order to assess the impact on personal health and wellbeing of alternative levels of health insurance. While intended for persons under the age of 61, the original questionnaire was used with persons up to 85 years of age.
Before items for this questionnaire were selected, the literature in the areas of physical health functioning, mental health and social health was carefully reviewed (see 12, 19, 86, 93, 108-111). These reviews represent perhaps the best summaries of the current state of the art in the areas examined. For each of these areas, those items or scales which were judged to be necessary to measure the basic concepts in each area, which were psychometrically sound, and which were appropriate to testing the hypotheses of the study were selected. Two alternative forms of the questionnaire were developed. One was answered by a sample of 1212 persons and the other by a sample of 835 persons. Both samples consisted of persons aged 15 and over, some of whom were aged 65 and over. The data obtained from these two samples were used to determine the reliability and validity of the different areas assessed by the questionnaire and provided the basis for further refinement. Reliability was assessed by means of test-retest and internal-consistency coefficients. The test-retest interval varied for different areas: about four months for physical health, six weeks for general health perceptions, and less than a week for mental health. Content and construct validity (see section 4.1) were assessed.

The questionnaire developed on the basis of this work consists of the following areas, some of which would not be relevant to a populational assessment of older persons but are important to the RAND study: attitude to medical care, effects of health and dental care; self-assessment of general health; instrumental and physical activities of daily living; general wellbeing, i.e. mental health symptomatology; social activities; change in major life events; physical health symptoms list; health perception; eating habits and diet; sleep and exercise; safety (with respect to driving); smoking; drinking (alcohol, coffee, tea).

Just as certain areas are present for RAND study purposes, other areas that would be needed in a population survey are absent. Specifically, there is no information on the availability of care in time of need, and there is no demographic section.

Although this questionnaire was not intended for older persons, we mention it here for a number of reasons.

(1) This is one of the most carefully constructed multidimensional questionnaires. In each area, attention was paid to conceptualizing the topics that needed to be dealt with and to determining the measures that best dealt with them.

(2) Both the reliability and validity of the questionnaire were examined. Changes were made to the questionnaire as appropriate. Further testing will undoubtedly be done.

(3) Although area summary scores are not available, scores for sets of items that measure the same concept can be obtained. Thus, a scoring system does exist.

(4) Unlike the other questionnaires examined, this one is designed to be self-administered. The purpose of the questionnaire is described. The name and telephone number of a person to contact are prominently displayed. Confidentiality is assured. Names are to be written only on a perforated section on the cover page, so that it is obvious that they can be easily removed. Above all, the instructions and layout are exceptionally clear. While coding columns are indicated (and thus transcription error is reduced), they do not intrude on the questions. A sample page is provided to illustrate the layout (see Annex 3).

Minor alterations would make this questionnaire fully relevant to an older population.

International Classification of Impairments, Disabilities and Handicaps (ICIDH) (49)

The ICIDH, developed by Philip Wood, is not a questionnaire. It is included here because it represents an extremely important classification system, the end-point of which describes overall functional status. Functional status, which is here termed "handicap" since the extent of negative functioning is considered, is assessed in each of seven areas, the "key dimensions of experience in which competence is expected of the individual". These are:

- orientation: defined as the individual’s ability to orient himself in relation to his surroundings;
- physical independence: ability to sustain a customarily effective independent existence, the independence being that reflected by self-care and activities of daily living;
- mobility: the individual's ability to move about effectively in his surroundings;
- occupation: ability to occupy time in a manner customary to the individual's sex, age and culture;
- social integration: ability to participate in and maintain customary social relationships;
- economic self-sufficiency: ability to sustain customary socioeconomic activity and independence;
- other: includes any other circumstances that may give rise to disadvantage.

"Other" handicaps are measured on a 4-point ordinal scale. Otherwise (with the exception of economic self-sufficiency), a 10-point ordinal scale is used, with 0 indicating the absence of a handicap and values of 1 and higher increasing levels of handicap. Levels of good functioning are not identified. On "economic self-sufficiency", points 0, 1, 2 and 3 reflect decreasing levels of adequate economic self-sufficiency.

Each type of handicap is defined, its characteristics (behaviour included and excluded) indicated and scale categories described. The appropriate scale category is that which accurately indicates the individual's level of functioning within his or her particular social and cultural environment. Its determination requires that the rater should be familiar with that environment (e.g. knows what are customary social relationships) and could result in different standards being used for different members of the same population. These, however, are matters that can be handled. The dimension ratings provide a profile of disadvantage status.

A handicap represents the social and environmental consequences for the individual stemming from the presence of impairments and disabilities. An impairment here is "any loss or abnormality of psychological, physiological or anatomical structure or function" (49, p. 27), while a disability is "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being" (49, p. 28). It is important to note, and worth repeating, that the aim here is not to identify impairments and disabilities or to assume that the individual in whom these are present has some handicap. The presence of impairments and disabilities may not necessarily be manifested as a handicap. Nor are specific impairments and disabilities necessarily linked to specific handicaps, although some are more likely to be manifested as certain handicaps than are others.

This classification, which can be seen as a multidimensional functional approach, is among the most recent available and has deservedly been attracting considerable international attention. The key terms used have been translated into a number of different languages (119), while the entire ICIDH has been translated into Dutch. The "Handicaps" section, which is perhaps the most operationally important, has been used as the basis for assessment in a rehabilitation setting (55). In this setting, the assumption is made that no further service is needed if a handicap is absent. Only if a handicap has been identified is further inquiry directed to determine its nature, what might have occasioned it and what ameliorative measures should be taken.

The main drawback of the ICIDH is that it is largely untested. Until a concerted attempt has been made to put the six handicap (survival) areas into operation, it will not be possible to determine whether the 10 levels, all but one being typically of inadequate functioning, are distinguishable and whether the handicap areas are unique. What we do have here is an extremely valuable conceptualization that can be put into operation and deserves careful attention.

**Sickness impact profile (SIP) (7)**

The SIP is a measure of health status designed to assess the outcome of health care as reflected in the performance of a wide variety of daily activities. The focus is on dysfunctioning rather than on levels of positive functioning.
The SIP has sometimes been placed in the general category of multidimensional functional assessment questionnaires (e.g. 59). However, it is not a measure of overall functional status and is not intended to be used as such. It is briefly mentioned here in order to make readers aware of its existence.

The SIP would appear to be intended for, and has been tested on, those with physical health problems. However, the areas examined would also seem to be relevant to persons with impaired mental health.

In its final form, the SIP consists of 136 items providing information in 12 categories. Three of these categories may be combined into a physical dimension (including ambulation, mobility, body care and movement); four categories may be combined into a psychosocial dimension (consisting of social interaction, alertness behaviour, emotional behaviour and communication). The remaining five independent categories are sleep and rest, eating, work, home management, and recreation and pastimes.

The SIP consists of a series of descriptive statements (e.g. I am not doing heavy work around the house; I laugh or cry suddenly) which the subject is asked to endorse only if they describe him on a given day and are related to his health. The questionnaire may be self-administered or given by an interviewer and takes 20-30 minutes to complete. Responses may be scored within each area and profiles and overall scores obtained.

Various aspects of reliability (e.g. test-retest, internal consistency) and validity (e.g. construct, criterion) have been assessed throughout the six-year period of development of the SIP, the final items selected being those that enhance the SIP's psychometric properties.

The SIP should be treated as the developers intended - as an outcome measure of health status when it is necessary to assess subtle changes in this status. It is inappropriate to use it as a multidimensional functional assessment, since it does not cover a sufficient number of areas of functioning.

1.2 Multidimensional assessment questionnaires of unreported validity and reliability

A brief overview of the content areas, basic characteristics and populational use of the questionnaires considered in this section is given in Table 2. These questionnaires have been selected because they, or the studies in which they were used, illustrate several different and important points.

(1) It is not always necessary to gather new data. In some cases, it is possible to adapt information already present. For instance, the United States Social Security Administration's longitudinal retirement history survey (LRHS) permitted the development of a functional classification system which allowed examination of change in functional status over a period of six years without the need to gather further data.

(2) Alternative classification systems have been developed and have proved useful in the contexts in which they were used, e.g. WHO health care utilization study, New Zealand studies of physical disability, and accommodation and service needs. While these particular classifications may not be applicable to other studies, knowledge of alternative ways of classifying information is nevertheless useful.

(3) Major studies using substantial representative samples exist. In some cases, their data are available for comparison and reanalysis, e.g. WHO health care utilization study, United Kingdom general household surveys and United States government surveys (the last-mentioned are not described here since they tend to be very specific in focus).

(4) Careful attention must be paid not only to data gathering but also to analysis, interpretation and communication of the findings. Two studies are mentioned in illustration: the New Zealand physical disability survey (34) and Townsend's study of poverty in the United Kingdom (97).
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</tr>
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<td>Physical health</td>
<td>++</td>
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<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
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</tr>
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<td>Social</td>
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<td>++</td>
<td>+</td>
<td>+</td>
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<td>++</td>
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<td>0</td>
<td>0</td>
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<td>++</td>
<td>++</td>
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<td>+</td>
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<td>++</td>
<td>++</td>
<td>++</td>
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<td>++</td>
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<tr>
<td>Other areas</td>
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<td>+</td>
<td>0</td>
<td>+</td>
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<tr>
<td>Demographic</td>
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<td>++</td>
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</tr>
<tr>
<td>Administrative</td>
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<td>+</td>
<td>++</td>
<td>+</td>
<td>?</td>
<td>+</td>
<td>++</td>
</tr>
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<td>Services</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td>Validity</td>
<td>++</td>
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<td>0</td>
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<td>0</td>
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<td>+</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>Usual administration:</td>
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<td></td>
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</tr>
<tr>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Approximate time taken (min)</td>
<td>90</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>60</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
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<td></td>
<td></td>
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<td>Type</td>
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<tr>
<td>Location</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximate number</td>
<td>11 153</td>
<td>48 000</td>
<td>2 200</td>
<td>4 700</td>
<td>16 600</td>
<td>14 000</td>
<td>2 000</td>
</tr>
<tr>
<td>Age</td>
<td>58-63/68-73</td>
<td>All ages</td>
<td>5+</td>
<td>65+</td>
<td>60-89</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Community resident</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Institutional resident</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Comments</td>
<td>Summary scores derived</td>
<td>Based on all forms</td>
<td>Based on three-stage assessment</td>
<td>Assessment based on pre-study protocol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 = absent or essentially so; + = present, minimal; ++ = present, adequate.
Below summary score, + indicates type, ? = uncertain.
United States Social Security Administration longitudinal retirement history survey
(LRHS) (50)

In 1969, the United States Social Security Administration gathered the first wave of
data in a 10-year longitudinal study of the process and impact of retirement in the
USA (50). Recognizing that retirement could be affected by, and have an effect on, many
diverse areas of personal functioning, information was gathered not only on work history and
retirement-related matters but also on all aspects of income, assets and debts; health;
household, family and social activities; and general attitudes. Some data on the spouse
were also sought. The sample consisted of a nationally representative group of 11 153 men
and unmarried women aged 58-63 in the first wave of the study. Married women were not
included since previous investigation had shown that their reaction to retirement was
primarily influenced by their husbands. The sample was reinterviewed every two years. The
questions asked on each occasion were not identical, but they did have a common core.

Because of the adequacy of the information gathered, it was possible to develop valid
and reliable means of assessing functional status in each of five dimensions (social,
economic, mental health, physical health and ADL) with this questionnaire. The manner in
which this was done and the functional classification systems useful for longitudinal
analysis that were developed are described in section 3.3 following discussion of the OARS
model.

World Health Organization - international collaborative study of medical care utilization
(WHO/ICS-MCU) (62, 120, 121)

The WHO/ICS-MCU was designed to examine and assess a health care service utilization
model. Information was sought on various factors considered to be either predisposing or
enabling. The former were conceptualized by demographic characteristics, household and
family composition, smoking, educational level, health-related attitudes, and responsibility
for health-related decisions. The latter considered family financial resources, the
availability and accessibility of health care, health insurance, and income security during
periods of sickness. In addition, various aspects of mental and physical health were
measured so that it would be possible to determine the social consequences of actual or
perceived ill health and to develop a limited health status index.

The study was cross-national, information being obtained on non-elderly persons in
12 sites. The data have been deposited in accessible data archives.

The importance of this study lies in the careful conceptualization of the model, the
way in which those concepts have been made to meet desirable psychometric standards, and the
analysis of the data so that the model could be tested. Particular attention should be paid
to the functional classification system developed by this study. This classification system
is concerned with functional health as determined by the extent to which the performance of
social roles is or is not impaired. Respondents are assigned to one of three groups: the
asymptomatic, who report no problems in any of the areas considered; the functionally
healthy, who report only minimal symptomatology and whose social functioning is not
affected; and the rest. This classification puts in perspective the problem being
examined, but does not restrict its examination.

New Zealand physical disability survey (54)

This survey, as well as the questionnaire it used, is described in detail in
section 3.1, where it serves as an illustration of the way in which information can be
usefully conveyed.

New Zealand accommodation and service needs of the elderly survey (89)

The focus of this particular study was the social characteristics and functional
capacity of elderly New Zealanders in relation to their existing accommodation and to their
needs for accommodation and services. The aim of the survey was to provide sound
information - a crucial first step in planning. To this end, information is presented in as
simple and straightforward a manner as possible. Qualifying comments, when needed, are made
in the text. Summaries of the main points and principal conclusions are collected together
in a separate section.
In this study, information was gathered by public health nurses during a semistructured interview. The sample was random and age-stratified, older persons being oversampled. A three-stage procedure was used for data gathering. Attempts were made to screen all who were initially selected (stage 1). All those considered to be disabled according to this screening, as well as those in institutions, were further interviewed (stage 2) and received a medical examination (stage 3). One in five of those who were not disabled was interviewed again but received no medical examination (i.e. stage 2 only). The overall response rate was 96.2%. This was somewhat less than expected (although obviously higher than in most studies) and was attributed to the use of an outdated population list (a substantial proportion of those not interviewed were deceased) and to the fact that interviewing took place during a holiday period.

During the screening interview, basic demographic, housing and household information was obtained, as well as information on mobility, capacity to feed oneself, vision, hearing, tendency to wander, self-protective capacity, mental state, continence, appearance, and general physical and mental condition. Indication of a substantial problem in any of these last 11 items defined the respondent as disabled and resulted in a second interview.

The second interview focused on the capacity to perform various physical and instrumental activities of daily living and the source and frequency of help in performing them, social contacts, frequency of use of selected services, and present housing and facilities. For each item, the public health nurse interviewer also assessed the need for help and the amount required. Although recording sheets were used rather than structured questionnaires, all terms were fully and carefully defined and consequently could be used in other studies.

The medical examination reviewed the major body systems and functional activities (mobility, transfer, stair-climbing, speech, etc.) as well as selected items needing special care. The presence and type of any mental disorder, together with psychiatric diagnoses, were recorded. The examinee's current level of independent residence and the level recommended were indicated. Again, all terms were closely defined.

Thus, information permitting the assessment of physical, mental and ADL status was gathered, and also some information in the social area. Economic matters were not inquired about (this may not have been necessary in the New Zealand context). The source and frequency of help available were determined. Information on services was limited to those facilitating independent residence and selected medical services.

While any incapacity may be problematic, it was considered more important to look at overall incapacity. Accordingly, aspects of mental, physical and ADL performance were used to develop a five-class general disability scale, as follows:

Class 1 - those not disabled;
Class 2 - slightly disabled (one or more non-extreme limitations);
Class 3 - sensorily disabled (the main disabling factor being advanced blindness or advanced deafness);
Class 4 - mentally disabled (where mental incapacity was the prime cause of disability);
Class 5 - severely disabled (unable to walk without help or incontinent; most persons in this category had multiple disabilities and required continuous nursing care).

Obviously, there is some conflict between this five-class system and a classification such as that based on the OARS model (see section 3.3). The latter would suggest that, given three areas (here mental, physical and ADL), eight classes representing all possible combinations of adequate and inadequate functioning in each of these three areas could be described. Certainly, one would expect that some persons would suffer from both mental and physical incapacities, a combination not included here.

However, the proof of a classification system lies in whether it describes accurately, helps to make sense of present information, and is useful for planning purposes. In the New Zealand context, this five-class system proved itself in these respects.
The aim of the WHO health care of the elderly study was to produce cross-national standardized data on the health of the elderly and their use of health services.

The questionnaire developed was, as far as possible, made up of items selected from other questionnaires and was further refined after a pilot study. It was precoded to facilitate data handling from different sites and analysis. Data were gathered by interviewers from age-stratified random samples of community and institutional residents in 11 countries.

Information was sought in the following areas: demographic, occupation and education; memory, mental function (symptomatology); physical health (self-assessment, diagnosis, symptoms list, chronic conditions, use of medication, smoking, drinking, physical activity); physical and instrumental ADL; social participation; housing; support from relatives, neighbours and community services; use of health and other selected services; interviewer evaluations. Only the most minimal economic information was sought.

Obviously, the focus is on a multidimensional assessment. The method of aggregating information was not specified.

A preliminary report of the findings is available (60) and a full report has recently been published (40). The results of this study may provide important standardization information, and consequently this questionnaire should be carefully considered for potential use after its validity and reliability have been determined.

United Kingdom 1980 general household questionnaire (UK GHQ, 1980) (97a)

In order to obtain information basic to social policy and in particular to facilitate governmental decisions on resource allocation among social programmes, the United Kingdom has been carrying out a general household survey since 1971. Information is sought in particular in five main areas: population, housing, employment, education and health. Information, which is gathered on a year-long basis from a sample of about 15,000 carefully selected households, varies somewhat from year to year. Content flexibility is desired so that emerging topics of importance can be included. Lack of uniformity, however, makes longitudinal comparison difficult and in some cases impossible. The response rate is about 85%, somewhat less among older households.

The 1980 general household questionnaire is of particular interest since it covers many of the areas desirable in a multidimensional questionnaire. While no attempt seems to have been made to gather information in the mental health area, some information is obtained about physical health (an open-ended item on long-standing illnesses and disabilities, self-assessment of health, and number of days incapacitated within the past two weeks) and on both instrumental and physical ADL. The ADL items are a selection of those used in a previous British survey of the status of the elderly (48), but in some cases have been reworded. Comparison of findings must therefore be made with caution. Importantly, information is gathered on the source of help in the ADL sphere. Information relevant to the social area tends to be scattered through the questionnaire (items on residential distance from relatives, frequency of visiting and leisure activities are included). Economic questions tend to focus on income from employment, rents and interest and on receipt of the more common forms of benefit. There is little information on assets. Extensive inquiry is directed to housing and related issues. Information on services is limited to those concerned with health and personal physical maintenance. Demographic information is, of course, sought.

Data from all the general household surveys, i.e. since 1971, are deposited in the Social Science Research Council (SSRSC) Survey Archive, University of Essex, Colchester, and are available for analysis. Potential users should note that some of the information gathered, e.g. on education, is specific to the United Kingdom, that not all the questions are asked of every age group (the 1980 version is probably more encompassing for those aged 65 and over than for any other age group), and that the questionnaire has not been administered to those in institutions.
Questionnaire on household resources and standards of living in the United Kingdom, 1968-1969 (97)

In order to assess and describe poverty in the United Kingdom, in 1968-1969 Townsend carried out a survey of households selected on the basis of a complex multistage stratified design based on addresses. The number of households at the relevant addresses totalled 2495, of which 2044 were included in the survey and were representative of national households. A secondary sample, focusing on the poor, was also drawn.

A lengthy interviewer-administered structured and precoded questionnaire, specially developed for this study, was used. It covered nine areas:

1. housing and living facilities;
2. employment;
3. occupational facilities and fringe benefits;
4. current monetary income;
5. assets and savings;
6. health and disability;
7. social services;
8. private income in kind;
9. style of living.

Naturally, the emphasis is on economic matters, but the additional information obtained, particularly in the health and disability and social services sections, permits assessment of aspects of mental and physical health and instrumental ADL, while the final section includes items related to nutrition. In addition, there is information on the type and amount of help given to and received from others, although not on other aspects of social health. Thus, this questionnaire does provide an overall view of the individual.

While the validity and reliability of the questionnaire itself were not determined, the psychometric properties of scales developed from sets of items present on the questionnaire were assessed.

Of particular interest is the manner in which the data obtained were presented (in the main, only simple but meaningful cross-tabulations were used), so that the findings can be readily understood by all, as well as the interpretation of the findings. Townsend's report should be considered required reading for all those interested in how information can be presented so that its social and political implications become clear.
2. CONSIDERATION OF THE SEPARATE AREAS OF FUNCTIONING

With the possibly sole exception of the sickness impact profile (SIP) questionnaire, multidimensionality is obtained by deciding which areas of functioning to cover, deciding for each area which topics to include and, finally, deciding how best to aggregate the information gathered within each area. We examine below each of the main areas of functioning typically included in multidimensional assessments. For each area, the types of topic considered, the manner in which these tend to be treated and the problems that may arise have been indicated. Special attention is paid to the approaches used by each of the three main multidimensional functional assessment questionnaires: CARE, MAI and OARS.

In certain areas - for instance, that of mental health - there have been significant advances since the main multidimensional assessments were developed. These advances are mentioned, even when they are not yet operational for the elderly, so that readers may be better informed of the types of measure which are becoming feasible and which may be expected in the next generation of multidimensional functional assessments.

The information provided here should be seen as a guide against which to check the content and measurement approach of a multidimensional functional assessment questionnaire and should not be used in any other way.

Areas will be considered in the following order:

1. activities of daily living;
2. mental health;
3. physical health;
4. social;
5. economic;
6. family;
7. housing;
8. other information related to the interview: demographic and administrative;
9. services.

For the first five of these (ADL, mental health, physical health, social and economic), concern is with distinguishing adequate functioning from inadequate functioning and then, if possible, discriminating between different levels of adequate and inadequate functioning.

Recent national experience of the government's taking the place of family and community as a provider of services and studies indicating the significant role played by the family suggest that increased attention should be paid to the family as an important resource in the provision of services. Consequently, a short section on the family is included. There is a brief mention of housing, since information on this topic is necessary if the situation of the older person is to be fully understood and if plans for suitable residence are to be made. The section on other information related to the interview, i.e. demographic and administrative data, is included as a reminder of the additional information that needs to be gathered if the population is to be properly described and if certain estimates are to be made.

Finally, multidimensional information on functional status, by showing where there are functional lacks, suggests remedies which should or could be applied. However, too little attention has been paid to measuring and assessing those remedies. The section on services is not concerned with linking specific remedial or ameliorative measures to specific dysfunctions. Rather, it is concerned with something more basic. It suggests that if we are to be able to assess the impact of a service, it is essential to know exactly what that service consists of. Designations may obscure the implications of the service that is actually provided, and the same service may be provided under a number of different names. We plead here for the development and adoption of accurate, acceptable, generic definitions of services. This should go hand in hand with multidimensional functional assessment if the results of such assessment are to be maximally useful.
2.1 Activities of daily living

Of all the areas of personal functioning, that concerned with self-care capacity and generally called "activities of daily living" is probably the single most important. Not only is performance in this area related to mental and physical health; it may also determine social wellbeing. Of particular concern here is whether it is feasible to live independently, whether the provision of some type of service may make continued community residence possible or whether incapacity is such that it is necessary to move to a specialized residential setting. Consequently, it is not surprising that considerable attention has been paid to ADL and that psychometrically sound measures of it are available.

When the briefest of assessments must be used, when inaccuracy can be tolerated, and when it is unnecessary to know the underlying reason for incapacity, the use of a short, standardized ADL scale should be considered.

ADL scales tend to be concerned with two types of activity: basic bodily maintenance (physical ADL - PADL) and activities basic to independent community residence (instrumental ADL - IADL). There are far more measures of PADL than of IADL. However, while persons with PADL impairments constitute an important group and often require extensive services, they are nevertheless quite few in number. For instance, in one survey of elderly community residents, the PADL activity for which help was needed by the largest proportion (11%) was bathing (112). In general population surveys of older persons, closer attention should therefore be paid to IADL activities, since these will be more relevant to a larger proportion of the elderly. Because of the limited percentage with PADL incapacities, the detailed inquiry typical of many PADL scales is not justified. If such information is needed, it should be elicited only from persons with identified PADL incapacities and not from the entire group of the elderly.

Measures of physical ADL

Probably the best known, and one of the most psychometrically sound, measures of PADL is that developed by Katz and his co-workers (e.g. 61). The "Katz" ADL focuses on six basic activities: bathing, dressing, going to the toilet (i.e. activities related to the elimination process but not including it), transfer (moving to and from bed and chair), continence and feeding. These items are hierarchically related, reflect the developmental patterns found in children, the successive stages of recovery in disabled patients and possibly, in reverse order, regression during the natural process of aging (61). Most scales owe an immeasurable debt to this one. It is not only included in multidimensional assessments (e.g. PACE II - a patient appraisal instrument designed for use specifically with the institutionalized (13a)) but is also the foundation on which many scales are based.

In developing the "Katz" ADL, it was found that to make it psychometrically sound, certain activities had to be omitted, including mobility, walking and stair-climbing. However, because of service-related implications, information on these matters may be essential. Some users have therefore weighed psychometric adequacy against practical usefulness and have also sought information on one or more of these three activities. Other activities that are sometimes added include grooming and the capacity to cut toenails. Because it is felt to be potentially embarrassing (although to whom is unclear), inquiry into toilet use is often omitted. In some scales, dressing and grooming have been broken down into components, but, as discussed earlier, such specific inquiry would seem to be neither necessary nor justifiable in a general survey of the elderly. As indicated in Tables 3 and 4, the major standardized multidimensional assessments focus on the basic six activities (except sometimes going to the toilet), with the possible additions of walking and grooming.

Measures of instrumental ADL

Far less work has been done in the area of IADL than in that of PADL, probably because it is only recently that there has been interest in the comparatively healthy.

A main problem here is determination of the activities to be included (for a discussion of this issue, see 88). Most of the IADL scales included in multidimensional functional assessments are derived from the work of Lawton & Brody (67a). The topics inquired about are listed in Tables 3 and 4.
Table 3. Presence of various PADL and IADL items in selected multidimensional functional assessment questionnaires of established validity and reliability

<table>
<thead>
<tr>
<th>Selected PADL items</th>
<th>CARE</th>
<th>MAI</th>
<th>OARS</th>
<th>Kilsyth</th>
<th>RAND HIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathe</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>c</td>
</tr>
<tr>
<td>Dress</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>c</td>
</tr>
<tr>
<td>Go to toilet</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>c</td>
</tr>
<tr>
<td>Transfer</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Continence</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Feed oneself</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>c</td>
</tr>
<tr>
<td>Walk</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Groom</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Go outside</td>
<td>+</td>
<td>(Implicit)</td>
<td>(Implicit)</td>
<td>+</td>
<td>Implicit in IADL in IADL</td>
</tr>
<tr>
<td>Climb stairs</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cut toenails</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Selected IADL items

| Use telephone                           | Implied | +    | +    | +       |          |
| Travel                                  | +       | +    | +    | +       |          |
| Shop                                    | +       | +    | +    | +       |          |
| Prepare meals                           | +       | +    | +    | +       |          |
| Do housework                            | +       | +    | +    | +       |          |
| Do laundry                              | +       | +    | +    |          |          |
| Do handyman work                        |         | +    |      |          |          |
| Take own medications                    | +       | +    | +    |          |          |
| Manage finances                         | +       | +    | +    |          |          |

+ = item present.
c = items combined into one question.
Table 4. Presence of various PADL and IADL items in selected multidimensional functional assessment questionnaires of untested validity and reliability

<table>
<thead>
<tr>
<th></th>
<th>WHO/ ICS-</th>
<th>New Zealand physical disability</th>
<th>New Zealand accommodation and service</th>
<th>WHO health care of the elderly</th>
<th>United Kingdom GHQ 1980</th>
<th>Townsend</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>LRHS MCU</td>
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<td></td>
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</tr>
</tbody>
</table>

**Selected PADL items**

<table>
<thead>
<tr>
<th>Item</th>
<th>WHO/ ICS-MCU</th>
<th>New Zealand physical disability</th>
<th>New Zealand accommodation and service</th>
<th>WHO health care of the elderly</th>
<th>United Kingdom GHQ 1980</th>
<th>Townsend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathe</td>
<td>O</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Dress</td>
<td>P</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go to toilet</td>
<td>E</td>
<td>+</td>
<td></td>
<td>+</td>
<td>Modified</td>
<td></td>
</tr>
<tr>
<td>Transfer</td>
<td>N</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
<td>Continence</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
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<tr>
<td>Feed oneself</td>
<td>E</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
<td>Walk</td>
<td>N</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groom</td>
<td>D</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go outside</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Climb stairs</td>
<td>D</td>
<td>+</td>
<td></td>
<td>+</td>
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<tr>
<td>Cut toenails</td>
<td></td>
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<td></td>
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</table>

**Selected IADL items**

<table>
<thead>
<tr>
<th>Item</th>
<th>WHO/ ICS-MCU</th>
<th>New Zealand physical disability</th>
<th>New Zealand accommodation and service</th>
<th>WHO health care of the elderly</th>
<th>United Kingdom GHQ 1980</th>
<th>Townsend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use telephone</td>
<td>O</td>
<td>+</td>
<td></td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>P</td>
<td>Implicit</td>
<td></td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shop</td>
<td>E</td>
<td>+</td>
<td></td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepare meals</td>
<td>N</td>
<td>+</td>
<td></td>
<td>E</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Do housework</td>
<td>E</td>
<td>+</td>
<td></td>
<td>R</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Do laundry</td>
<td>N</td>
<td>+</td>
<td></td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do handyman work</td>
<td>D</td>
<td>+</td>
<td></td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take own medications</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manage finances</td>
<td>D</td>
<td></td>
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</table>

+ = item present.
It is probably obvious that each of the IADL items represents a complex task made up of many components. Housework, for instance, includes tasks such as cleaning windows, washing paintwork and sweeping floors and is broken down in some questionnaires, e.g., United Kingdom general household surveys of 1978 and 1980. Unless there is a particular reason for it, there seems to be little point in such detailed inquiry, which consumes time that could be used to obtain information in a different sphere of activity and has little service implication.

Validity and reliability of selected ADL scales

The ADL scales used in multidimensional functional assessment questionnaires are probably among the best analysed scales available, although they differ with respect to the specific aspects of validity and reliability examined. The "Katz" ADL is essentially designed as a Guttman scale and its predictive validity is well established. Reliability of assessment is ensured through clear and unambiguous scoring directions to cover major contingencies. The validity of the CARE PADL items has been established by comparing response with actual behaviour, an approach also used by OARS for both the PADL and IADL items.

The MAI has compared response to items with general assessments by observers, interviewers, clinicians and administrators who have long-term knowledge of the respondent. Close agreement was found. Both internal (Cronbach's alpha) reliability and test-retest (three-week interval) reliability were examined. The former was satisfactory, the latter was low, mainly because the sample studied was small and the range of impairments restricted. Using a somewhat larger sample with a less restricted range of impairments, OARS found reliability to be highly significant. It should be remembered that the MAI and OARS ADL scales are derived from each other and are very similar.

The "Katz" PADL and OARS IADL and PADL scales are given in Annex 1.

Problems

While the ADL items may look straightforward, inquiry into the capacity to perform them may be complicated by different types of problem.

(a) Cultural bias

IADL introduces certain cultural problems not present with PADL. PADL deals with certain necessary basic bodily concerns. While carrying out some of these activities may be easier in some cultures than in others (there may be different standards of grooming, etc.), the differences are probably minor. This may not be the case with IADL items, where some items may scarcely be relevant and performance of others may require a different level of capacity in different settings. For instance, use of a telephone is only relevant in a society where most people have a telephone and where it is considered a necessity. If few people have a telephone, inquiry about capacity to use it is irrelevant. Capacity to do laundry may be determined by the facilities available. It is one thing to do laundry by machine and another to do it by hand. So, while it may be essential to know whether an individual can do his or her own laundry, if findings are compared cross-nationally or between the more affluent and the less affluent sections of the same country, one should not be surprised to find substantial differences in the proportion of the population able to do such a task. Finally, some activities may be of special importance in a particular society. Gardening in New Zealand is one example. If the scale is to be relevant, such items should be included.

The moral, of course, is to consider the list of items carefully and to make sure that the items included are relevant to the population being examined. In this respect, Sainsbury's (88) conceptualization of ADL as a measure of activities engaged in by most people over a period of a month may be helpful in considering substitutions. The main drawback in altering a scale so that it is more appropriate is that validity and reliability are no longer known and may have to be established. On the other hand, the original scale, if not relevant, may not be valid either in the new setting.

(b) Asking about items not usually performed

Measures of ADL are typically concerned with assessing whether the respondent currently performs each of a set of activities. However, difficulties arise when the activity
inquired about is one not performed by the respondent, perhaps because the activity is sex-linked (e.g. meal preparation, which still tends to be the province of women), because there is no opportunity to carry it out (e.g. travel when transport is unavailable) or because the respondent is enjoined from doing it by rules or regulations (e.g. bathing, which residents of institutions may not be permitted to do unaided or unsupervised).

One technique used to get around such problems is not to ask, "Do you do (activity)?" but rather, "Can you do ?!" While the latter approach occasionally results in an over-optimistic report of capacity, in general it seems to be satisfactory. Where sex-linked activities are concerned, there may be one scale for men and another for women (e.g. for grooming, inquiring about shaving for men, and brushing and combing hair for women).

(c) Item clarity, specificity of response

Generally, ADL items are very clearly specified so that there is no question about what they refer to or the level or type of competence measured. However, there are problems occasionally, and it is wise to read items bearing in mind possible misinterpretation by the respondent.

The capability levels measured should be checked carefully. Sainsbury (88) found that respondents had no problem in describing three levels of competence with regard to the performance of an activity (i.e. can do without difficulty/can do with difficulty/unable to complete), but they could not assign grades of difficulty with any degree of assurance. The "Katz" ADL uses only two very clearly specified levels (independent/dependent); CARE uses a two-stage system, determining first whether the activity can be performed unaided and then, if it cannot, the type or amount of help needed; MAI and OARS both use a 3-point scale defined in terms of the amount of help needed (no help needed/some help needed/unable to perform). More detailed scoring is present in some scales. However, when this scoring depends on the respondent's assessment, Sainsbury's finding would suggest that the apparently finer scoring levels may, in fact, yield inaccurate information. Again, it is as well to bear in mind that for population-level assessment, scoring beyond three levels is probably unnecessary.

Scoring of the ADL area, aggregation of information

Scoring tends to be at two levels: scoring of each item separately and scoring of the items as a set. At the level of the individual respondent, item scoring indicates which items can be performed at what level. At the population level, item scoring indicates what proportion of the population can perform each of the tasks and at what level. The latter can be used as a guide to the type and amount of service needed to maintain the population studied. It is, however, only a rough guide and may overestimate service requirements, for it does not take into account possible overlap in service provision, the fact that certain IADL-related services may not be appropriate for persons with certain PADL difficulties or the amount of service already being received.

When scored as a set, the PADL and IADL items may be kept separate (an alternative in the MAI) or combined (e.g. OARS). Although these items have occasionally been found to conform to the requirements of a Guttman scale, i.e. the items can be ordered hierarchically in such a way that knowledge about capacity to perform a "higher" item indicates that items lower down in the scale can also be handled adequately, such scaling only seems to be feasible when inquiry into walking is omitted and only seems to hold for institutional populations. In order to cope with this problem and obtain summary information on ADL, a general rating of ADL capacity based on the level of performance of each item may be made. To this end, a 5-point summary scale is available on the MAI and a 6-point scale on OARS. Typically, ratings in the ADL area are more reliable than those in any of the other areas examined.

Extension of inquiry via ADL items

Many developers of ADL scales have recognized that, once it has been determined that help is needed to perform some task or that a particular task cannot be done at all, it is logical to ask what type of help is used (e.g. a special device and/or a person) and, if a person is used, the relationship or source of the helper (e.g. spouse, other household member, agency personnel). The use of such information to determine the current level of service is obvious. Good examples of such extension of inquiry on ADL items are the United
Kingdom general household survey and two New Zealand surveys on accommodation and service needs (89) and on physical disability (54).

United Kingdom 1980 general household survey

Questions in this area are of the following general form (the form differs slightly with different items to ensure appropriate response):

p. 30, q. 16

Do you usually manage to get in and out of bed

| on your own | 1 | (a) |
| or only with help from someone else? | 2 | (b) |

(a) Do you find it easy or difficult to do this on your own?

| Easy | 1 | q. 17 |
| Difficult | 2 |

(b) Who usually helps you?

| Spouse | 1 | q. 17 |
| Other member of household | 2 |
| Other person (specify) | 3 |

The New Zealand surveys direct their inquiry somewhat more extensively:

New Zealand accommodation and service needs survey, 1976 (89)

Example: MEAL PREPARATION Help: Spouse

(main meal of the day) Relative/friend
Voluntary (anyone representing a group of citizens organized to provide a community service)
Public (employees of national government or local bodies, such as hospital boards)
Private (private enterprise)

New Zealand physical disability survey, 1981 (54)

Excerpts from q. 123. HOUSEWORK: Do you do all the housework?

No, only others (0) Self and others (1) Yes (self only) (2)

Who else mostly helps you?

Spouse (and/or) children Parent Relatives Friends Hospital staff Private homehelp Other

The complete HOUSEWORK question in its original format appears as Table 5, since it is a fine example of clear layout, full coverage of relevant issues related to the main topic (HOUSEWORK) and appropriately directed inquiry. An approach such as this, which ensures that the question asked is relevant to the respondent, is appropriate when further information is desired from a particular subsample. In these examples, note the careful definition of terms that could be misunderstood, e.g. voluntary, public, private. We would recommend that if this type of listing is adopted, family and friends should be listed separately since studies indicate that they are not equivalent.
Table 5. Use of a branching process to obtain relevant information

**HOUSEWORK**

123. Do you do all the housework?
   - No only others 0
   - Self and others 1
   - Yes (self only) 2

Who else mostly helps you?
- spouse (and or) children 1
- parent 2
- relatives 3
- friends 4
- hospital staff 5
- private homehelp 6
- other ________ 7

Is this because of your condition or would that person be doing it anyway?
- because of condition 1
- would do it anyway 288
- other ________ 38
- DK 48

What is the main difficulty?
- can't do housework at all 0
- get tired, can't stand 1
- can't bend 2
- can't reach 3
- can't see 4
- other ________ 5

Do you have any difficulty when doing the housework?
- No 0
- Yes 1

What difficulty?
- get tired, can't stand 1
- can't bend 2
- can't reach 3
- can't see 4
- other ________ 5

Do you find this satisfactory or do you need more help?
- Yes, satisfactory 0
- No, not satisfactory

Why is this?

Disruption to household tasks

official use only

Source: Reference 54.
2.2 Mental health

"There is no satisfactory definition that specifies precise boundaries for the concept 'mental disorder'" (20, p. 5). According to DSM-III, the currently accepted classification manual of mental disorders in the USA, a mental disorder is a clinically significant behavioural or psychological syndrome or pattern that occurs in an individual and is typically associated with either a painful symptom (distress) or impairment in one or more important areas of functioning (disability). The underlying inference is that there is a behavioural, psychological or biological dysfunction and that the disturbance is not only in the relationship between the individual and society.

In their mental health assessments, multidimensional functional assessment questionnaires are unusual in that they purport to be as concerned with measuring good mental health as poor mental health. In this, they experience a difficult task since most assessments of mental health focus on the presence of impairment, and there has been little conceptualization of what constitutes good mental health or of how it should be measured. Additionally, the measures rarely examine actual behaviour, perhaps because only in extreme cases are mental symptoms so manifested. Rather, there is concentration on self-reporting of the presence of those symptoms found to be indicative of psychiatric disorder and on assessment of cognitive incapacity.

Examination of the mental health sections of the main multidimensional functional assessment questionnaires indicates that information is typically sought on some combination of the following:

- identifying the presence of organic disease and its extent;
- determining the presence of that symptomatology which indicates psychiatric disorder;
- personal assessment of mental wellbeing;
- noting positive aspects of mental health;
- estimating personal mental capabilities, e.g. with respect to decision-making and use of services related to mental health.

Numerous measures have been developed for the first three areas. The most commonly used and better standardized of those for the first two areas have been critically reviewed by Kane & Kane (59) (see also the other reviews mentioned there, p. 80) and, for the third area, by George & Bearon (32a). The volumes by Mangen & Peterson (72) also contain relevant material.

The most basic decision to be made in assessing mental health is whether to assess mental functioning, i.e. the extent to which cognitive or affective impairments impede role performance and subjective life quality, or psychiatric diagnosis (81).

The mental health sections of multidimensional functional assessment questionnaires, in fact, try to do both. Recognizing that deterioration in cognitive functioning is most likely at older ages and that it may determine whether an individual can, with safety, continue to live independently, assessment of cognitive functioning is invariably included. In the USA, one of two equivalent brief assessments tends to be used, the mental status questionnaire (MSQ) (58) or the short portable mental status questionnaire (SPMSQ) (80). While the former was developed for institutional and the latter for community use, each can and has been used in both locations. Those without organic brain syndrome, as diagnosed by a geropsychiatrist, are rarely misidentified, but only 55% with organic brain syndrome are correctly classified (29). To the extent that ability to answer correctly cognitive questions referring to place, person, current and past events and reasoning reflect capacity to function, the lack of diagnostic discrimination (particularly since the criterion is also fallible) is not necessarily problematic. The SET test (51) is more likely to be found in multidimensional assessments developed in the United Kingdom. This test requires the subject to name animals, fruits, colours and towns. Each correct response is given a score of 1, with a maximum score of 10 in each category and a total maximum of 40. Scores of less than 15 suggest the presence of senile dementia. Further standardization of the SET test is desirable. One advantage of this test is that it may appear less objectionable to the interviewer than some of the items on the MSQ and its variants. There has been so much concern about this aspect of these tests that items are sometimes scattered throughout a
questionnaire rather than being presented as a set. How this affects the final score is not known. Accurately informing the subject of the purpose of the test and gaining the subject’s confidence would probably overcome this problem. Further attempts at diagnosis vary from questionnaire to questionnaire. At times, brief symptomatology lists are used to help to indicate whether psychiatric impairment is present. Many such lists exist, most of which have been developed for institutional populations, and it is unclear how useful they are among community residents. Typically, they are intended to identify the presence of psychiatric problems, but not necessarily their severity. The 30-item general health questionnaire (34), which has been used internationally, focuses on functional mental disorders and does permit assessment of severity of impairment. CARE (38), one of the main multidimensional assessments, uses a much longer list that permits a diagnosis to be assigned.

In the last decade, there have been considerable advances in the structured use of symptomatology to determine psychiatric diagnosis. Readers should be aware of two significant approaches: those of Bond et al. (10) and of Wing and his colleagues (115-118).

Bond et al. (10) needed an instrument suitable for use in a large-scale survey of 5000 older persons which would provide information permitting them to estimate the level of health and social work statutory services required for this population. A literature survey indicated that no suitable instrument existed. Data gathering was to depend on 60 interviewers, so a structured approach was essential. Since the information had to be service-relevant, they decided that it was important to know the class of psychiatric disorder (i.e. organic, affective disorders and psychoneuroses, schizophrenias and paranoid disorders), as different classes required different forms of service, but that further specificity was unnecessary. The questionnaire that they developed - the survey psychiatric assessment schedule (SPAS) - represents a serviceable compromise between collecting information on symptomatology and trying to obtain a formal psychiatric diagnosis.

The SPAS is based on a modification of the MSQ and the geriatric screening schedule, the latter being adapted from the geriatric mental state schedule (18). All items are completely structured and the interviewer need make no personal assessments.

Cut-off scores were developed to indicate the presence of a "case". Sensitivity (accurate identification of a "case") and specificity (accurate identification of a "non-case") were 82% and 94% respectively for organicity (the criterion was another questionnaire), 72% and 84% for affective disorders and psychoneuroses, and 40% and 100% for schizophrenias and paranoid disorders. It should be emphasized that the first two classes are distinctly more common among the elderly than is the last, so that lack of identification here is not as serious as it may seem. Further testing of this instrument is considered desirable by the developers, who do not currently recommend it for screening. We mention it because it illustrates important matters of conceptualization: knowing that they needed a psychiatric assessment, Bond et al. determined what level of detail would be useful and, given data-gathering constraints, how information could be most reliably collected. Available instruments being inappropriate, they adapted instruments of established validity and reliability, so maximizing the likelihood of obtaining a good measure, and then tested the measure they developed.

In a population survey, it is probably unnecessary to go beyond the level of specificity defined by Bond et al. Specific psychiatric diagnosis is, however, feasible, although so far only for younger persons. Specifically, the present state examination (PSE), which has been translated into 11 languages and used in several countries, has been structured for use in a general population survey, administration being by trained interviewers (e.g. 10, 115, 117, 118).

It is, then, quite practicable to use trained interviewers and a structured approach to obtain information on the presence or absence of psychiatric impairment among the elderly residing in the community and in institutions, and there are strong indications that differential diagnosis will become increasingly feasible.

As mentioned earlier, multidimensional functional assessment questionnaires adopt a broad approach to mental health. The diagnosis/symptomatology approach is frequently supplemented by personal assessments of mental wellbeing, indirect information based on the use of or need for psychiatrically related services (e.g. medication, treatment, supervision), interviewer assessments and importantly, when the subject cannot or will not respond, proxy information (e.g. an informant's assessment, records).
Approaches taken by multidimensional functional assessment questionnaires

Since CARE was specifically concerned with the assessment of mental health, items were selected in such a way as to make diagnosis feasible. Diagnosis is determined by the pattern of subject response to specific items and can be reliably assessed. In addition, summary ratings are obtained on severity of symptoms, positive personality, positive mood and positive cognition, in each case on a 10-point scale where the points are described in behavioural terms. In all cases, a rating of 0 indicates no significant symptoms (or no significant assets) and a rating of 9 severe symptoms or an abundance of assets. Considerable reliance is placed on the interviewer's assessment.

While one might question whether it is feasible or necessary to have 10 levels of adequate functioning or 10 levels of inadequate functioning, the point that CARE demonstrates is that it is quite possible to have an assessment that can be used successfully as both a diagnostic and functional status instrument.

Two domains in the MAI relate to mental health: the cognitive domain and the personal adjustment domain. The cognitive domain uses a modification of the mental status questionnaire (58) and four symptoms observed or experienced in this area, i.e. memory, time, location and confused conversation. The personal adjustment domain uses a brief measure of morale and five common psychiatric symptoms. Thus, it is possible to assess the presence of organicity and personal wellbeing, but other psychiatric assessment is not really possible; nor is information available that could be used to indicate excellence of mental health, as there is in CARE. Status is summarized by summing subindex responses in the separate domains.

The mental health section of OARS includes the short portable mental status questionnaire (80), the 15-item short psychiatric evaluation schedule (80a), which assesses psychiatric symptomatology, self-ratings of the extent to which the respondent worries, finds life exciting and satisfying, mental health at the present time and in comparison with five years previously, and information on the use of psychiatrically related services. As with the MAI, it is possible to determine the presence of organicity, but OARS can also indicate whether other psychiatric problems are present (although not their diagnosis) and provides some information about good mental health. When the subject cannot or will not respond, OARS also seeks informant-based reports regarding the extent to which the subject shows good common sense and can handle major and minor problems in his or her life. Information is summarized on a 6-point scale, where a rating of 1 indicates an excellent level of functioning and a rating of 6 indicates total impairment.

In summary, the main methods of assessing mental health at the populational level use a structured approach typically administered by trained interviewers and are concerned with diagnosis. This latter feature may constitute an attempt to obtain a specific diagnosis, to place an individual within a particular diagnostic category or to determine whether someone is or is not a "case". Such assessments are concerned with inadequate functioning. There have been far fewer attempts to assess levels of adequate functioning. While we recognize the presence of creativity and originality, awareness of, interest in and concern about different situations, there has been little concern to try to conceptualize what is actually involved in good mental functioning. Current measures included in multidimensional functional assessment questionnaires are somewhat bland — e.g. assessments of morale or of life satisfaction — although the OARS questionnaire is, perhaps, concerned with something more vital when it asks whether the respondent finds life exciting and can manage major and minor problems. For a critical survey of measures, see George & Bearon (32a). At present, it is more feasible to determine whether mental health functioning is or is not adequate than to assess levels of adequacy or inadequacy.

A survey of mental health topics included in the multidimensional assessments described earlier is given in Table 6.

While assessment of mental health is considered a crucial element of an overall assessment, it is as well to recognize that the reverse is also true — an overall assessment is important in determining what services should be provided when mental health is impaired. As pointed out in DSM-III (20), a treatment plan must be based on a comprehensive evaluation, including information on physical health, psychosocial stressors and highest recent adaptation level.
Table 6. Mental health topics included in selected multidimensional assessments

<table>
<thead>
<tr>
<th>Questionnaires of established validity and reliability</th>
<th>CARE</th>
<th>MAI</th>
<th>OARS</th>
<th>Kilsyth</th>
<th>RAND HIS</th>
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<tr>
<td>Presence/absence</td>
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<td>+</td>
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<td>Mental wellbeing</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Positive aspects of mental health:</td>
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<td>Self-assessed</td>
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<td>Interviewer-assessed</td>
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<td>Summary scores</td>
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<th>Questionnaires of unestablished validity and reliability</th>
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<th>New Zealand physical disability</th>
<th>WHO health care of the elderly</th>
<th>United Kingdom Townsend 1980 GHQ</th>
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<td>Organicity</td>
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<tr>
<td>Presence/absence</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mental wellbeing</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Positive aspects of mental health:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-assessed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviewer-assessed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summary scores</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

+ = present.
2.3 Physical health

In this area, concern lies with assessing current functional capacity attributable to the state of physical health. We shall distinguish between physical health, as assessed in terms of physical condition, symptoms, illnesses, exercise and self-care capacity (activities of daily living). Some investigators do not separate these areas. To the extent that areas may overlap, making it difficult to determine whether a particular problem, e.g. mobility, should be considered one of physical health or one of self-care, combination is justified. However, we prefer to keep these areas separate, since ADL incapacity does not always reflect a physical health problem and ADL-related maintenance and rehabilitation may demand very different services from those demanded by physical health problems.

Different approaches, in various combinations, have been used to assess physical health status. These include:

- self-assessment of overall health;
- symptoms lists;
- inquiry into illnesses, conditions and medications;
- level of activity;
- use of medical services.

These approaches all have their drawbacks and their advantages; each of them will be considered in turn. Their presence in the multidimensional assessments discussed earlier is indicated in Tables 7 and 8.

Self-assessment of overall health

On a population basis, self-assessment of overall health provides a good indicator of actual health status and of use of health-related services. Recent findings, for instance, reveal that the better the self-rated health, the fewer are the number of health problems, ambulatory and medical care visits, and number of days hospitalized in the previous year (87).

At the individual level, self-assessment information is somewhat suspect, since subjective assessment does not necessarily agree well with medically determined status (e.g. 69). Before deciding whether to include an item such as this, it is as well to determine the intended purpose of the information. If that purpose is to assess accurately physical health status, then the findings may be suspect. If the purpose is to assess the likelihood of service use, then the findings may be appropriate.

An unfortunate problem, which holds sway not only within the physical health area but too often also within other areas, is that health self-assessment questions have not been standardized. Further, they are not necessarily included in questionnaires where they might be expected to be found. Consider, for instance, the examples drawn from widely used questionnaires in Table 9. These questions vary with respect to time referent, population referent, number of levels among which to choose and descriptors for each level (they also vary with respect to coding, but that does not concern us here). Note in particular that no example is given for the WHO/ICS-MCU study, which focused on factors affecting health services utilization and sought considerable information on physical health status. While one might well expect to find a health self-assessment question in this study, such an item is not present. This particular example is included to warn readers that expected items may not necessarily be present and that it is the potential user's obligation to check for the presence of preferred items.

Symptoms lists

The number of symptoms lists is legion. Their intended use has ranged from assessment of need for medical service to diagnosis.
Table 7. Presence of selected topics related to physical health in functional assessment questionnaires of established validity and reliability

<table>
<thead>
<tr>
<th>Topic</th>
<th>CARE</th>
<th>MAI</th>
<th>OARS</th>
<th>Kilsyth</th>
<th>RAND HIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-assessment</strong></td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Symptoms list:</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended, list only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list and impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured, list only</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>list and impact</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Illnesses, conditions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended, diagnosis only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>diagnosis and impact</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structured, diagnosis only</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>diagnosis and impact</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medications:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Structured</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Illness/medications combined:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open-ended, no impact inquiry</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>impact inquiry</td>
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</tr>
<tr>
<td>Structured, no impact inquiry</td>
<td>+</td>
<td></td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td>impact inquiry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level of activity:</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Incapacitation</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Physical exertion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Use of medical services</strong></td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Nutrition:</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food intake</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Capacity to prepare food</td>
<td>+</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Interviewer assessment</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td><strong>Summary scores</strong></td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = information sought.
Table 8. Presence of selected topics related to physical health in questionnaires of untested validity and reliability

<table>
<thead>
<tr>
<th></th>
<th>WHO/ Zealand</th>
<th>New Zealand</th>
<th>WHO United Kingdom Townsend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LRNS ICS-HCU</td>
<td>physical dis-</td>
<td>accommo- dation of the GHQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ability</td>
<td>and elderly 1980</td>
</tr>
</tbody>
</table>

|                  | I   | M   | N   | E   | T   | D   | E   | I   | +   | R   | C   | V   | A   | +   | +   | +   | +   |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Self-assessment  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Symptoms list:   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Open-ended,      | I   | M   | N   | E   | T   | D   | E   | I   | +   | R   | C   | V   | A   | +   | +   | +   | +   |
| list only       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| list and impact | +   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Structured,      | I   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| list only       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| list and impact | +   | I   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Illnesses,       | W   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| conditions:      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Open-ended,      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| diagnosis only  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| diagnosis and    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| impact           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Structured,      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| diagnosis only   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| diagnosis and    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| impact           |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Medications:     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Open-ended       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Structured       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Illness/medications combined: |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Open-ended,      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| no impact inquiry |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Structured,      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| no impact inquiry |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Level of activity: |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Incapacitation   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Physical exertion |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Use of medical services |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Nutrition:       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Food intake      |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Capacity to prepare food |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Interviewer assessment |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Summary scores   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

+ = information sought.
<table>
<thead>
<tr>
<th>Source</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>US/UK CARE, rev. 1979 (38), q. 110</td>
<td>Compared with a person your age, how would you rate your physical health at the present time? Excellent (1), a good (2), fair (3), poor (4)?</td>
</tr>
<tr>
<td>US OARS, 1975 (21), q. 53</td>
<td>How would you rate your overall health at the present time? Excellent (3), good (2), fair (1) or poor (0)? (Not answered (-))</td>
</tr>
<tr>
<td>US MAI (68), q. 18</td>
<td>In general, would you say your health is excellent (1), good (2), fair (3) or poor (4)?</td>
</tr>
<tr>
<td>US RAND HIS, 1980, Green Cover (12), q. 68</td>
<td>Is your health better (1), worse (2) or the same (3) as that of other people your age? (Don't know (4))</td>
</tr>
<tr>
<td>WHO/ICS-MCU (62, 120, 121)</td>
<td>How do you feel about your present health? Do you feel quite healthy? Yes (1), no (2)</td>
</tr>
<tr>
<td>WHO health care of the elderly study, 1978 (144), q. 30, 31, 32</td>
<td>How would you evaluate your present health? Is it very good (1), fairly good (2), average (3), fairly bad (4), bad (5)?</td>
</tr>
<tr>
<td></td>
<td>If you compare your health with that of other persons of your age, is your own health better (1), about the same (2), worse (3), cannot say (4)?</td>
</tr>
<tr>
<td>UK GHQ, 1980 (97a), p. 22, q. 1</td>
<td>Over the last 12 months, would you say your health has on the whole been good (1), fairly good (2) or not good (3)?</td>
</tr>
</tbody>
</table>

a For all of the above questions, coding is given in parentheses.

Historically, Hoffer & Schuler (44) seem to have originated the "symptoms" approach. They developed two lists, one of 22 items and the other of 27. The items were selected from relatively standard clinical histories and were judged to be health danger signals serious enough to warrant medical attention. Untreated symptoms were considered to indicate a need for medical service. The symptoms were not used to indicate health status, although that is how they are now more commonly used. WHO/ICS-MCU uses a list of only four items: phlegm, chest pain and/or pressure, joint pain, and shortness of breath (it should be noted that this is not the sole measure of health in this study; if it were, a longer list would be preferred). Particular attention should be paid to the simplified, symptom-based version of the International Classification of Diseases, which is designed for international use. Symptoms have also been used for diagnostic purposes. The developers of CARE (38), for instance, have successfully used symptoms to identify such physical health conditions as arthritis, heart disorder, malnutrition and visual problems, but such diagnoses require a lengthy listing. Examples of symptomatology lists, drawn from the Kileyth questionnaire, RAND HIS, WHO/ICS-MCU and the WHO health care of the elderly study, are given in Annex 2.

On several grounds, an investigation of symptoms is an intuitively reasonable approach to obtaining a rough assessment of physical health. They reflect the concerns that lead to, or should lead to, seeking health-related service; people know when they have these symptoms (assuming the description of them is sufficiently specific), and the symptom is evident while a diagnosis is not always present. It should be noted that inquiry into
symptoms and inquiry into diagnosis may yield different information with regard to physical health, the former being more likely to indicate the presence of problems. A symptoms list, however, does not provide information on the extent to which the symptom impairs performance. To determine that, additional inquiry is needed.

Illnesses, conditions and medications

A standard way of trying to assess physical health status is by inquiring about the presence of chronic conditions and diagnosed illnesses. An immediate difficulty here is that contact with medical services is assumed. Cross-nationally there are problems, both with respect to comparability of diagnosis and with respect to the extent to which diagnosis is accurately imparted to the respondent. Inquiry may be based on a list (typically leaving a place for "other" conditions or illnesses in case the respondent's particular situation is not included) or by an open-ended approach. Both have their advantages.

While the time span under consideration is not a problem when reference is to current illnesses or conditions, it does need to be accurately defined when referring to chronic conditions. The United States health interview survey (104) defines a chronic condition as one first noticed by the respondent more than three months before the interview or any one of a list of 30 items (Table 10). This definition makes very clear what may be considered chronic and what may not. Unfortunately, not all questionnaires are careful to be so specific. When a time range is not specified, information on chronicity must be considered suspect.

Open-ended inquiry into the presence of conditions and illnesses places the onus of recall on the respondent. Diagnoses may be forgotten, and conditions may not be mentioned because the respondent may not consider them to be of sufficient consequence or may be embarrassed by them. This is less likely to happen with a structured approach. The structured approach serves as an aide-mémoire, and items that the developer considers important are more likely to be included. However, there are problems with this approach. Those who consider using such a listing should make sure that all relevant items are present, particularly those having special importance in their location. Certain items are frequently omitted - for instance, dental problems. Lists developed where there are high standards of public health and ready access to medical care may not include illnesses that are endemic elsewhere. It is essential to check that conditions which are suspected to be present in the population to be studied and which affect functional health are listed.

Unfortunately, diagnosis does not provide accurate information on functional state. In order to determine whether illness affects functioning, specific inquiry is necessary. This is done in the OARS questionnaire, for instance, when for each diagnosed illness the respondent is asked, "How much does it interfere with your activities - not at all, a little or a great deal?" The New Zealand physical disability survey (54), which uses an open-ended inquiry, has a comparable approach, asking, "Do you suffer from any (other) chronic illness or condition which makes it difficult for you to get about and do your work?" When more than one illness or condition exists, parcelling out the difficulty among them may be problematic. While the information can be used to indicate whether a physical condition interferes with normal functioning, utmost caution should be used before implicating a particular diagnosis.

Closely akin to questions about chronic illnesses and conditions is inquiry into medications. The inquiry may be open-ended or structured, with the problems inherent in both procedures, although if the respondent is being interviewed at home the interviewer may ask to see the medications. Sometimes all medications are asked about, in others only those prescribed. The latter restriction makes cross-national use problematic since different countries have different regulations regarding which medications can be purchased over the counter and which only by prescription. In addition, a medications list has the same problems as a diagnosed illnesses/conditions list, for it, too, implies that there is contact with medical services and that medical practice is uniform. Administratively, a medications list provides a very useful check on an illness list (certain medications indicate the presence of particular illnesses; if the medication is present, the illness should also be checked as present) and for individual clinical inquiry. In fact, CARE combines its medication and illness inquiries by asking, "q. 117. During the past month, have you taken a drug prescribed by a doctor for [list of 21 illnesses and conditions]?") Alone, however, a medications inquiry is probably not as useful as a symptoms, illnesses or conditions list.

- 39 -
<table>
<thead>
<tr>
<th>Condition causing activity limitation</th>
<th>International Classification of Diseases (Eighth Revision) code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis, all forms</td>
<td>010-018</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>140-209</td>
</tr>
<tr>
<td>Benign and unspecified neoplasms</td>
<td>210-239</td>
</tr>
<tr>
<td>Diabetes</td>
<td>250</td>
</tr>
<tr>
<td>Mental and nervous conditions</td>
<td>290-304, 305.0, 305.3, 305.5, 305.6, 306-309, 780.6, 781.5, 785.6, 786.2, 790.0, 790.2</td>
</tr>
<tr>
<td></td>
<td>390-398, 402, 404, 410-429, 782.1,</td>
</tr>
<tr>
<td>Heart conditions</td>
<td></td>
</tr>
<tr>
<td>782.2, 782.4</td>
<td></td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>430-438</td>
</tr>
<tr>
<td>Hypertension without heart involvement</td>
<td>400, 401, 403</td>
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<tr>
<td>Varicose veins</td>
<td>454, 456</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>455</td>
</tr>
<tr>
<td>Other conditions of the circulatory system</td>
<td>440-453, 457, 458, 782.0, 782.3,</td>
</tr>
<tr>
<td>782.5-782.9</td>
<td></td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>490, 491</td>
</tr>
<tr>
<td>Emphysema</td>
<td>492</td>
</tr>
<tr>
<td>Asthma, with or without hay fever</td>
<td>493</td>
</tr>
<tr>
<td>Hay fever, without asthma</td>
<td>507</td>
</tr>
<tr>
<td>Chronic sinusitis</td>
<td>503</td>
</tr>
<tr>
<td>Other conditions of the respiratory system</td>
<td>470-486, 500-502, 504-506, 508-519, 783, 531-534, 550-553</td>
</tr>
<tr>
<td>Peptic ulcer</td>
<td>520.3, 520.4, 520.6-521.5, 521.7-523, 525-530, 534-543, 560-577, 784, 785.0-785.5, 785.7, 785.8</td>
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<tr>
<td>Hernia</td>
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<tr>
<td>Other conditions of the digestive system</td>
<td>594-611, 613-629, 786.0, 786.1,</td>
</tr>
<tr>
<td>Diseases of the kidneys and ureter</td>
<td></td>
</tr>
<tr>
<td>Other conditions of the genitourinary system</td>
<td>768.3-786.7, 789</td>
</tr>
<tr>
<td>Arthritis and rheumatism</td>
<td>710-716, 717.0, 717.1, 717.9, 718, 720-723, 725, 728-732, 733.0, 733.2, 733.3, 733.6, 733.9, 734</td>
</tr>
<tr>
<td>Other musculoskeletal disorders</td>
<td></td>
</tr>
<tr>
<td>Visual impairment</td>
<td></td>
</tr>
<tr>
<td>Paralysis, complete or partial</td>
<td></td>
</tr>
<tr>
<td>Impairments (except paralysis) of back or spine</td>
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</tr>
<tr>
<td>Impairments (except paralysis and absence) of upper extremities and shoulders</td>
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</tr>
<tr>
<td>Impairments (except paralysis and absence) of lower extremities and hips</td>
<td></td>
</tr>
<tr>
<td>Condition not specified:</td>
<td></td>
</tr>
<tr>
<td>Old age</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
There has been extensive research into the accuracy of reporting of chronic conditions, illnesses and hospitalization for physical health matters. By and large, there tends to be under-reporting, especially when the time period covered is comparatively lengthy, e.g. six months as compared with two weeks. More salient events are more likely to be reported, and some that occurred outside the time span for which information is requested may be reported as occurring within it (99-102).

Level of activity

Level of activity can range from total incapacitation to extreme physical exertion. The major concentration has been on assessing the former.

A commonly used measure of morbidity is the number of days of restricted activity within a specified time period (e.g. two weeks for the United States health interview survey and for WHO/ICS-MCU, six months for OARS, and 12 months for CARE and MA1). With longer time periods, there is more likely to be underassessment of disability days. A distinction is typically made between days when usual activity could not be pursued, but where there was no confinement to bed, and days when the whole day or a specified minimum part of it was spent in bed. The underlying implication is that the longer the period of restriction, the poorer is the health of the respondent, an assumption for which there is supporting evidence (e.g. 83). However, to the extent that the length of time bed-bound may reflect medical convention and cultural differences, it is necessary to exercise caution in cross-cultural and cross-national comparisons.

While the number of days restricted is often measured, perhaps because of a focus on poor health, the other logical end of the continuum - extent of participation in physically strenuous activities - has been more rarely examined. Such information, however, is needed if excellence in physical health is to be assessed. Questionnaires that do inquire into this area include OARS, the RAND health insurance study questionnaire and the WHO care of the elderly cross-national survey.

Use of medical services

In order to obtain additional information on health status, the extent of use of medical services is often investigated, e.g. number of hospitalizations within a given time period, number of nights in hospitals, number of visits to a physician, attention from a nurse, etc. In addition to the fact that such items are plagued by problems of accuracy of recall, other conditions exist that make interpretation difficult. These include differences in the availability of, or access to, medical facilities and providers, as a function of location, personal economics, the influence of medical insurance and differences in style of medical practice. Thus, an assessment of physical health status based on the use of such services may only be meaningful in a uniform and restricted setting. However, if there is concern about whether all persons with the same health status receive comparable medical service regardless of geographical location or economic circumstances, then information of this type could be useful, particularly if it can be linked to information on the availability of services and providers. A good example of such a study is that of McCoy & Edwards (72).

Nutrition

Perhaps because nutritional state is so difficult to measure accurately using simple techniques (75), information in this area is not always obtainable. The questionnaires that do attempt to gather relevant information seem either to go into extreme detail and have available additional laboratory-based techniques to assess nutritional state (e.g. 24) or rely on accuracy of recall regarding the consumption and preparation of certain foods, and use this information to assess whether the respondent is appropriately nourished. The Kilsyth questionnaire (82), for instance, asks about the weekly frequency or amount of intake of selected foods and the number of hot meals consumed. The information is then used to identify persons "at risk" for malnutrition. Apart from the standard problems of this approach (problems of recall, determining size of portion, definition of "hot meal"), it is culture-bound. While these items may provide a valid indicator in the population among whom they were first used, they may be totally inappropriate in a population with very different eating habits. It is perhaps no wonder that many questionnaires, in attempting to get some information in this area, rely on the interviewer to indicate whether the respondent is obese or emaciated (e.g. OARS) or whether the respondent has difficulty in obtaining, preparing or consuming food (CARE).
Aggregation of information

Ideally, each piece of information should be individually useful and, when combined, should permit the placement of each respondent on a scale that runs from status excellent to status totally impaired.

A significant problem with this procedure is that different measures look at different aspects of health. Aggregation such as that suggested requires multidimensional information to be placed on a unidimensional scale. With the exception of the MAI, which provides for scoring by dimension, aggregation of the different types of physical health information tends to represent that which seems most sensible to the developer. So OARS, for instance, uses a 6-point scale (1 = excellent functioning, 6 = totally impaired) to summarize subjective assessments of health status, and reporting from a medications list, an illness and chronic conditions list and disability days. Unfortunately, excellence of functioning is rarely assessed, and a single ordering going from excellent to totally impaired is unusual. Only one MAI index (self-rated health) permits assessment of excellence of health, the other MAI measures showing, at best, absence of a problem. CARE, too, tends to take the latter approach. On its 10-point scale, 0 indicates "no significant symptoms" and 9 severe symptomatology. Positive physical assets are assessed on a separate 10-point scale (0 = no significant assets, 9 = abundance of assets), the rating being based on interviewer impressions.

Other questionnaires have used other approaches, classifying information in the best way for the purpose at hand. So, to give just one example, WHO/ICS-MCU combines five types of information: social dysfunction (i.e. bed days or restricted activity days), perceived morbidity (reported illnesses), symptoms (reports on four indicators and on anxiety), perceived dental morbidity (dental problems), and perceived visual morbidity (visual problems). On the basis of the pattern of responses to these items, respondents are grouped into three classes: the healthy (reporting no disorder in any of the five categories), the functionally healthy (who have no social dysfunction and only the mildest level of disorder in any of the other categories), and the rest.

Means of aggregating information are not always provided. Even when they are provided, it is necessary to check whether the aggregation is suitable for the user's purpose. If it is not, an available system may be altered (e.g. on OARS, the user might prefer a three-level system to a six-level system) or, as in the case of WHO/ICS-MCU, an appropriate one developed.

2.4 Social

"Social" health has been defined as the "quantity and quality of an individual's interpersonal ties and extent of involvement with the community" (19, p. 20). To this definition, we would add that social health should reflect not only the links between the individual and the community, but also the links between the community and the individual. This necessary two-way relationship is rarely made explicit.

Probably the most exhaustive survey of the literature in this field is that of Donald et al. (19). These authors not only summarize the information available but, importantly, try to integrate and make sense of it. In particular, they point out that many measures of social health do not distinguish clearly between social functioning and mental health, physical health and self-care capacity. While type of functioning in one area may reflect capacities in another area (e.g. good social adjustment has been used as a measure of positive mental health; Sainsbury (88) refers to self-care capacity as a measure of social functioning), nevertheless, conceptually, social health may be assessed apart from the other areas. This, in fact, is the approach taken by multidimensional assessment instruments.

As a result of their extensive survey, Donald et al. identified four main areas in which social participation and interaction are manifested (19):

- family and home;
- social, e.g. friendships;
- community involvement, e.g. participation in organizations;
- work (or major role activity if unemployed in the traditional sense).
Where the elderly are concerned, the major focus has, for obvious reasons, been on the first three of these since increasingly fewer older persons are employed.

In most scales intended for use with the general population, the focus in these areas tends to have been on identifying the extent of the respondent's involvement. Inquiry is therefore directed into such matters as the number of living children, their sex, where they live, how frequently they visit; how many friends the respondent has, frequency of contact with them; satisfaction with contacts with family and friends; how many social organizations the respondent belongs to, frequency of attendance, and whether office is held.

There are two major and quite different problems with this type of approach.

(1) Inquiry into matters concerned with amount or frequency (e.g. number of friends, how often meetings are attended) has the underlying assumption that more is better. Kahn & Antonucci (57), in surveying the literature, found that the number of people known or the frequency of contact did not ensure greater satisfaction, better health or better coping with old age. Rather, it was the quality of the social support and the presence of a confidant(e) which were related to personal wellbeing and to physical health status. The crucial difference lay between having no confidant(e) and having one, while beyond a total of four close friends there seems to be no additional improvement in social health (64, cited in 19). Most multidimensional functional assessment questionnaires seek information on both quantity and quality of social relationships, but vary with regard to inquiry about quantity, CARS being the most extensive and OARS the least extensive in this respect.

(2) In assessing interpersonal ties, focus is typically on the ties that the respondent has with others. However, it is crucial, particularly where the elderly or the impaired are concerned, also to determine the ties that others have with the respondent. Not only does this provide a more complete "social" picture, but it also provides information that is critical for planning purposes. In particular, it is important to determine what services are provided as a result of those ties and by whom, since it is the availability and provision of such services which may in good measure determine whether the older person can live in the community or should be provided for in an institutional setting. For further details on this, readers are referred back to section 2.1.

Tables 11 and 12 focus on the main categories of inquiry in the social area and briefly indicate the coverage by various multidimensional functional assessment questionnaires. Readers should be warned that the phrasing of questions and their coding are rarely identical across questionnaires, the differences at times being so great that items can in no way be considered equivalent. Consider, for instance, the following questions from the MAI and OARS, each intended to determine availability of help from informal (i.e. non-agency, nonprofessional) sources.

**MAI**

q. 56 Would you stay with any of your (children/brothers or sisters/other relatives) if you were sick for a while?

Yes (3), no (1), DK (2)

q. 58 Do you have any friends or neighbours who would help you if you were sick for a short time?

Yes (3), no (1), DK (2)

**OARS**

q. 14 Is there someone who would give you any help at all if you were sick or disabled, for example your husband/wife, a member of your family or a friend?

Yes (1), no one willing and able to help (0)

[IF "YES" ASK (a) AND (b)]
(a) Is there someone who would take care of you as long as needed (indefinitely) (1), or only for a short time (a few weeks to six months) (2), or only someone who would help you now and then (e.g. taking you to the doctor or fixing lunch occasionally, etc.) (3) ?

(b) Who is this person?

Name ____________________________
Relationship ______________________

The OARS item is more informative. Here, the focus is on the availability of help and its anticipated duration, matters of importance in assessing support for the individual. The phrasing is such that extraneous matters, such as the location where help would be received and the specific type of helper, do not intrude on the basic concern: the availability and likely duration of help. The MAI phrasing may well result in an underestimate of the availability of help. The final selection decision, however, rests with the potential user, who must decide which phrasing provides the information desired.

Aggregation of information

The social area, such as physical health, is also multidimensional. Nevertheless, both CARE and OARS permit summarization of information on single-rating scales. In the case of the MAI, the social area is the psychometrically weakest of the areas examined and consists of three sub-areas. Addition of responses within each area yields a score.

CARE conceptualizes the social area very broadly indeed, including not only the matters discussed here, but also environmental issues (housing, neighbourhood crime), financial status, ADL capacity and the availability of help with ADL tasks. CARE offers three scales. One, which considers all the matters just mentioned, permits rating to indicate level of dysfunctioning (0 = no significant problem, 9 = severe problem, i.e. no contact with others, unable to provide essential self-care, deteriorated residential environment, financially destitute). The other two scales measure positive aspects. One is called "positive material environment" (focusing on financial and residential matters); the other is called "positive human environment" and is concerned with the ready availability of friends. In both cases, ratings range from 0, representing "no significant assets", to 9, representing an abundance of assets, and depend on subjective assessments by interviewers.

OARS uses a 6-point scale, where, as is usual with the OARS scales, 1 = excellent functioning and 6 = totally impaired. The extent of availability of help and the number and adequacy of social relationships are weighted and combined, with a specific rating representing a particular pattern of response across these three issues. Either the OARS or the MAI approach to aggregating information seems suitable and is probably preferable to that of CARE, where there is aggregation across many very different areas.

2.5 Economic

Because of widely differing economic standards, programmes and social expectations, assessments of economic status developed in one country cannot be applied in another without modification. Consequently, here we have tried to outline briefly the basic concerns underlying an assessment of economic status and to emphasize the kinds of issue (which tend to be at least as much politically as economically oriented) that must be dealt with.

In assessing economic status, concern may lie with assessing adequacy or equity of income. Adequacy, as used here, refers to the extent to which personal requirements for food, shelter, clothing, medical care and reasonable expenses can be met. Equity tends to be concerned with whether income is in line with some criterion: personal income before retirement, the mean wage, etc. (for a discussion of this issue, see Amann (1)). These two concepts are not equivalent. Equity is very much a political issue, with which we are not prepared to tangle, so the focus here will be on adequacy.

Assessment of income adequacy is a matter of some complexity involving objective criteria, subjective assessments and social concerns. It must take into account not only how much money is needed in order to maintain a person, but also the socially acceptable and desirable levels of maintenance and personal attributes of the individual, such as age and extent of and reason for disability.
Table 11. Categories of inquiry in the social area in selected questionnaires of established validity and reliability

<table>
<thead>
<tr>
<th></th>
<th>CARE</th>
<th>MAI</th>
<th>OARS</th>
<th>Kilsyth</th>
<th>RAND HIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household composition</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Marital status</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of children</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of siblings</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other relatives</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency and type of contact with kin</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Help when needed</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Confidant(e)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Number of friends</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Frequency and type of contact with friends</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Help when needed</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Participation in organizations</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

+ = item present.

Table 12. Categories of inquiry in the social area in selected questionnaires of unestablished validity and reliability

<table>
<thead>
<tr>
<th></th>
<th>WHO/ LRHS</th>
<th>New Zealand ICS-</th>
<th>New Zealand accommodation and service</th>
<th>WHO health care of the elderly</th>
<th>United Kingdom GHQ 1980</th>
<th>Townsend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household composition</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Marital status</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of children</td>
<td>+</td>
<td></td>
<td>c</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of siblings</td>
<td>+</td>
<td></td>
<td>c</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Other relatives</td>
<td>+</td>
<td></td>
<td>c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency and type of contact with kin</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Help when needed</td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Confidant(e)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency and type of contact with friends</td>
<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Help when needed</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Participation in organizations</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+ = item present.

C = combined inquiry.
Attempts to assess economic status range from subjective assessments of income adequacy to detailed inquiry into amount and source of income, assets and debts. The latter information may then be adjusted in terms of hidden subsidies, such as when an older person lives with children and does not have to pay for shelter or grows his or her own food. The resulting figure may then be related to a particular standard, such as the national poverty level. It may also be further modified to take account of special financial need - for instance, that arising because of limited self-care capacity.

The type of information that should be gathered and alternative ways of handling it have probably been most carefully spelled out by Townsend (97). His approach should be seen as a useful guideline - indeed, the most useful currently available, for it defines clearly what kind of information should be gathered and why.

The main areas specified by Townsend (97, pp. 88-89) are the following.

<table>
<thead>
<tr>
<th>Type of resource</th>
<th>Main system from which derived</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Cash income:</td>
<td></td>
</tr>
<tr>
<td>(a) Earned</td>
<td>i.e. from wages and salaries, self-employment income, financial systems</td>
</tr>
<tr>
<td>(b) Unearned</td>
<td>i.e. income from assets - rent, dividends, interest, insurance policies, financial systems</td>
</tr>
<tr>
<td>(c) Social security</td>
<td>i.e. social insurance and assistance, employer sick pay and pensions, family, fiscal systems, court maintenance orders</td>
</tr>
<tr>
<td>(2) Capital assets:</td>
<td></td>
</tr>
<tr>
<td>(a) House/flat occupied by family and possessions</td>
<td>e.g. family, public authority loans systems, building societies and insurance companies, employer subsidy, fiscal systems</td>
</tr>
<tr>
<td>(b) Other assets</td>
<td>e.g. employer gift, family, earnings, fiscal systems, capital issues systems of companies, banks and insurance companies</td>
</tr>
<tr>
<td>(3) Value of employment benefits:</td>
<td></td>
</tr>
<tr>
<td>(a) Employers' fringe benefits</td>
<td>e.g. industrial welfare system, fiscal system</td>
</tr>
<tr>
<td>(b) Occupational facilities</td>
<td>e.g. industrial planning and management safety inspectorate, trade unions</td>
</tr>
<tr>
<td>(4) Value of public social services:</td>
<td></td>
</tr>
<tr>
<td>Chiefly other than cash, including government subsidies and services, e.g. health and education, but excluding social security</td>
<td>e.g. central and local public education and welfare systems</td>
</tr>
<tr>
<td>(5) Private income in kind:</td>
<td></td>
</tr>
<tr>
<td>(a) Home production</td>
<td>e.g. family, personal leisure, self-employment</td>
</tr>
<tr>
<td>(b) Gifts</td>
<td>e.g. family</td>
</tr>
<tr>
<td>(c) Value of personal supporting services</td>
<td>e.g. family, community</td>
</tr>
</tbody>
</table>

Obviously, it is also crucial to know how many persons are supported, for economic adequacy is a function of income and the number of persons for whom that income must provide.
In addition to determining income, some also consider it important to assess expenditure in order to determine whether a disproportionate amount is spent in certain areas (e.g. heating, household maintenance, personal care services) necessitating retrenchment in other areas (e.g. clothing, food, replacement of durables). A complete listing of types of expenditure is available in a publication by Phillips et al. (81).

The questionnaire developed by Townsend for his surveys of poverty in the United Kingdom is a good example of how economic information can be obtained. An example that may be even clearer (in large measure because of the questionnaire layout) is the earnings, assets and debts section of the United States Social Security Administration's 1971 LRHS questionnaire (see 50). The OARS economic section is a briefer version based on LRHS.

Some investigators hesitate to ask detailed economic questions, feeling that to do so is intrusive, that respondents will refuse to participate further, that getting adequate information takes too long, and so on. There is justification for such concern when the respondent has grounds for concealing income or assets. However, for a sound income policy, full and accurate data are essential and should be obtained if at all possible. As a fall-back position in case of refusal, a flashcard listing possible monthly and annual income categories may be used, the respondent being asked to select that category within which his or her income falls. It has been found that the category selected agrees with income based on detailed information 74% of the time; however, on 17% of occasions, respondents select a category indicating a higher level of income.

Assessing adequacy of income

Obviously, accurate financial information is crucial but in itself does not indicate whether income is adequate. There are various ways of assessing income adequacy. The simplest, and probably the least desirable, is to ask questions such as the following.

LRHS (1969)

q. 127. Which of the following four statements describes your ability to get along on your income?

(1) I can't make ends meet
(2) I have just enough, no more
(3) I have enough, with a little extra sometimes
(4) I always have money left over

OARS

q. 28. How well does the amount of money you have take care of your needs?

(2) Very well, (1) fairly well, (0) poorly

Investigators differ with respect to the value they place on answers to such questions. However, since a study of responses indicates that they do not discriminate well between those with high and low incomes and since individuals differ in their personal assessment of what they find adequate, we would not advocate reliance on such an item.

A more objective approach is preferable so that everyone can be compared using the same criterion. Alternative criteria are available, which again have been most clearly developed by Townsend (97) in the course of his examination of poverty. Townsend discusses three alternative definitions of poverty:

(1) The state's standard of poverty. This varies by country and in the USA is a multiplier of the cost of a specified amount of food supposedly adequate for minimum nutrition, adjusted by the number of persons in the household and geographical location. It is as well to go back to original sources to determine the standard of living to which the poverty level corresponds. Too often, it seems to be one that is entirely inadequate. Ideally, it should meet some socially acceptable criterion.

(2) Relative income standard of poverty (defining the poor as the bottom 10% in income or as those with less than a certain percentage of the national mean income, e.g. less than 50% of the mean). This type of definition is problematic, for it makes it difficult to assess the impact of services intended to improve economic status.
(3) The deprivation standard of poverty (the level at which participation in a community's style of living becomes financially problematic or impossible). While conceptually this is an interesting approach, putting it into operation requires intimate knowledge of a culture and of those aspects of it crucial to satisfactory social integration, e.g. the foods, household goods, holiday observances, etc., commonly expected, the lack of which due to financial problems may indicate poverty. Thus, an index would have to be developed for each country, indeed for each culture. More problematically, as national standards of living change, the content of the index would have to change also, making longitudinal comparison difficult.

A fourth approach, which is not mentioned by Townsend (97) and which is a variant of (1) and (3), is implicit in the three-level budgetary standard developed in the USA. This reflects, in a somewhat circular fashion, both the amount of money needed to live in a certain style and the style of living expected of people at certain income levels. The lowest budget level is not intended to represent a minimum or subsistence level of living and, in fact, for certain groups of people is below the United States poverty level. At each level, assessment is made of the cost of consumption (i.e. housing, house furnishings and house operation, transportation, clothing and personal care, medical care, other family consumption), other costs (including gifts, contributions, life insurance, occupational expenses), social security and disability insurance payments, and personal income taxes. Estimates are constructed for different areas of the country for a hypothetical family of four and for a retired couple, multipliers being available to adjust for households of different sizes (see 98). The budget levels are revised annually, so longitudinal comparison is possible. However, it should be noted that these budgets include, as hidden and unspecified, such items as type of household goods and entertainment expenditures, which Townsend makes explicit and which we argued earlier are problematic. These do not, however, constitute the major focus here as they do in Townsend's approach. Nevertheless, the United States approach should only be considered as a guide, and the specific content of such an approach must reflect accurately the lifestyle of the country in which it is to be used.

This fourth approach offers a particular advantage over the first three in that it is essentially a criterion-linked income adequacy scale. The first two approaches could also be turned into a scale. A scale based on the state poverty standard would use fractions of the poverty level and one based on relative income would use different ratios of the mean. However, the development of a scale for the deprivation standard would be very difficult.

2.6 Family and friends

The importance of family and friends in both the social area and as service-providers (see section 2.1) has already been mentioned. We should, however, like to emphasize the role of the family, in particular, as providers of service, taking account of the need to determine what kind of service they provide, whether the amount of service provided is adequate, and the likelihood that the service provision can continue without undue strain. While several multidimensional assessments inquire about source of help (e.g. CARE, MAI, OARS, the United Kingdom general household survey 1980, and the New Zealand physical disability survey (54)), only specialized questionnaires currently investigate the burden placed on the helper (e.g. 25, 84). Because of the recognized importance of the family, future multidimensional assessment can be expected to pursue this question.

In the USA, family and friends provide more personal care service to the older person than is received from any other source (46, 103, 112). In other countries, the informal network may play a lesser role. Before making service provision decisions that may unwittingly destroy a satisfactory system, information on current practice is needed. If information on the status of the elderly is to be used to determine service requirements, it is necessary to know what services are currently being received and from which sources and the likelihood of the continued availability of those sources. It is then possible to assess current shortfall, estimate what type and volume of service are needed to maintain the current level, and calculate the type and amount of additional service that should be provided. Some ways of delivering service may be considered inappropriate and a decision may be made to phase them out, but until the current manner of service provision is accurately identified, useful decisions and accurate projections will not be possible.
2.7 Housing

The general area of housing is one to which considerable attention has been paid, concern being with both the adequacy of the residence and the quality of the neighbourhood in which it is located. With respect to the housing itself, the focus tends to be on assessing:

- the type of housing, e.g., detached house, apartment, single room;
- structural soundness, e.g., damp walls, leaking roof;
- the presence of vermin;
- facilities, e.g., acceptable plumbing (hot and cold running water, flush toilet, sink, bath or shower), kitchen (working stove, refrigerator), adequate forms of heating and/or cooling;
- whether the respondent has sole or shared access to the bathroom and kitchen;
- the amount of space per person and/or rooms per person, whether the room is shared with others;
- safety within the residence, e.g., presence of slip rugs, frayed or trailing electric cords, fire hazards, and presence of safety devices such as hand-rails;
- adequacy of furniture, e.g., stability, sufficiency;
- accessibility, e.g., the number of steps or flights of stairs to the residence and their condition;
- general interior upkeep;
- the estimated value of the housing, whether in the private or the public domain;
- the level of satisfaction with housing or with aspects of housing.

Where the neighbourhood is concerned, items examined include:

- the general condition of the area, e.g., slum, middle-class, etc.;
- the general safety of the area, e.g., freedom from crime by day and night;
- the type and accessibility of facilities and services and their adequacy, e.g., transport, shops, pharmacy;
- noise;
- the age structure of the inhabitants of the area;
- changes in the neighbourhood, e.g., deterioration, improvement;
- the stability of the neighbourhood, e.g., whether residents are transient;
- the level of satisfaction with aspects of the neighbourhood.

On the basis of such information, certain standards covering various aspects of housing are then selected in order to assess the adequacy of the place of residence as a safe, secure and satisfactory shelter. The items considered and the standards selected vary from country to country and, within countries, over time. Among other matters, they reflect construction standards, the demands of climatic and economic conditions, advances in public health knowledge, current social standards and also future expectations.

It is very common to ask about level of satisfaction with housing and the neighbourhood. The answer to such a question, however, does not provide objective information about actual housing conditions. Rather, it tends to indicate that older persons are less likely to complain about their housing than are younger persons (83).
In an assessment intended to be applicable to both community and institutional residents, it is also necessary to determine whether the standard of adequacy used for community residence can be appropriately applied in an institutional setting. There are certain housing-related matters which affect individuals regardless of where they may live, such as access to services, a structurally sound building and a comfortable indoor temperature, but there are also certain facilities that some persons cannot or should not use, e.g. kitchen appliances. While community residents need and may expect these, is it appropriate to downgrade the housing of persons in institutions because they have minimal access to such facilities? This issue requires careful attention.

Among the standardized multidimensional functional assessment questionnaires, both CARE and MAI inquire about housing, the former being more concerned with the presence of specific facilities and the latter with satisfaction with the residential situation. Lawton et al. (68) report that housing is the least reliable of the MAI sections; information on the CARE housing inquiry is not available. Facilities are also emphasized in the United Kingdom 1980 general household survey and the WHO study of health care of the elderly. The facilities approach is preferable, since the information describes the actual living situation and permits an objective assessment of its adequacy.

2.8 Other information related to the interview

Demographic

Demographic data permit identification of the population. Cross-sectionally, such information is essential to determine the actual size of the group at issue, their proportional representation in the total population and their contributions and demands. Longitudinally, it permits projection of future size and proportional representation, and hence functional status and service demands.

As indicated below, a variety of information tends to be sought under the general heading of “demographic”. Among these data, age, sex, marital status and – in some countries – race are perhaps the most important, in good measure because at a population level each is related to functional status, while these and the type of living arrangement have been found to be related to service demand. Knowledge of the relative distribution of these factors in the older population, and the changes in them expected over time, is of basic importance in predicting future functional status and future demand for service.

The type of demographic information typically gathered includes the following.

- Age at the time of interview or, more often, date of birth. It should be noted that not all people know when they were born and determining the date is not always easy.
- Sex. Generally determined by observation when an interviewer gathers data.
- Race. The specific classification used tends to vary from country to country and generally reflects the anticipated racial composition of the population under study.
- Marital status. Typically recorded as single (i.e. never married), married, widowed, divorced or separated. Information on local custom should also be included, e.g. common-law marriage, unmarried but living together.
- Educational level. Generally recorded in terms of grades completed through high school and, after that, completion of technical training and/or university degrees conferred.
- Occupational status. Specific information on the major lifetime job, e.g. that held longest, is typically sought. This information is then coded into a restricted number of occupational categories. The latter vary from country to country.
- Also sometimes included are the following.
  - Area of residence. This may be coded in diverse ways, e.g. as urban, suburban, rural (with each of these defined), by name of county or other local administrative unit, etc.
  - Place of birth. Again, coding may be very specific or may use broad classifications; while recording should be specific, coding should reflect the purposes of the user.
- Language typically spoken.

- Religion. Coding should reflect the major religions present. If one or more is represented by different denominations, consideration needs to be given as to whether denomination should also be determined.

- Household composition. Information is often sought on the age, sex, educational status, marital status and kin relationship to the household head of all persons living in the household. However, information that is unlikely to be used should not be obtained. The terms "household" and "head" (if the latter is used) must be carefully defined. It is probably best to select the standard definition of the country in which the survey is being conducted unless the survey is part of a cross-national study, in which case a commonly agreed definition must be used. If the definitions are determined beforehand and adequate data collected, these can be coded to reflect the preferred definition.

Demographic information is often collected in more detail than may be strictly necessary. Not only may this adherence to detail make more sense to the respondent, but it may also permit the user of the information to develop alternative systems for coding the data.

When the data are aggregated, the final categories selected should be meaningful with respect to the purposes of the study and should also permit direct comparison with other studies. For instance, since differences between the "young old" and the "old old" have been established, for many comparisons the elderly are grouped into those aged 65-74 and those aged 75 and over. This, however, would be an inappropriate grouping to use if, for example, interest lay in examining employment among the elderly in the USA. There the grouping should be age 65-71 and 72 and older, since the penalty for earning income above a certain amount no longer holds once the age of 72 is reached.

Administrative

It is essential that careful track should be kept of all aspects of data gathering. It is crucial to know whether the desired persons were contacted. If they were not, some attempt will have to be made to rectify the situation; otherwise, the sample may not be representative.

For those who are contacted and who participate, it is necessary to know whether usable information was obtained, from whom and under what conditions.

Among information which is typically included in the interview schedule and which provides basic data about the interview is the following.

- Name, address and telephone number of the person interviewed.

- Type of residence (typically used to indicate whether the respondent lives in the community or in an institution; if residence is in an institution, the type of institution should be indicated).

- Name or identification number of interviewer.

- Record of attempts to contact desired respondent, by date and time of day.

- Date(s) of interview (some interviews may not be completed on a single occasion).

- Starting and ending times of interview (to assess how long the interview takes; when interviewers also have to make ratings, it will be necessary to determine whether to include here the time spent on this activity).

- Completeness of interview, whether interview refused, partially answered or completed. For refusals, as much information as possible should be gathered on demographic characteristics and on the reason for refusal so that it is possible to determine whether the sample is biased.

- Source of interview information, whether from the person selected, a proxy or both (acceptable proxies must be determined ahead of time).
- Assessed reliability of information obtained (such information is typically gathered, but it is unclear whether it is used).

- Distractions during the interview, e.g. whether another person was present.

- For longitudinal studies, it is useful to obtain the name, address and telephone number of another person likely to know the location of the subject should he or she move.

2.9 Services

Assessment of functional status is rarely, if ever, disinterested. Such assessments are typically intended to inform policy-makers and care providers so that they can make better-informed decisions regarding service provision. Here we shall not deal in detail with services, since that is not our purpose. We shall, however, make a few points about service assessment.

In order to determine the impact of services, it is necessary to define them very clearly. Several questionnaires ask about service receipt. In some, there is confusion between the service received and the service provider. Since certain service providers may perform a variety of discrete services, it is necessary to be able to identify these. In addition, it is essential to recognize that identical services may be made available by different providers. Thus, in order to determine what services are being received and to estimate service need, a generic definition of service is required. Further, in order to take into account the widely varying requirements of a diverse older population, it is necessary to consider a very broad range of services. Some multidimensional questionnaires include inquiry into services. Typically, such inquiry is extremely restricted, focusing on services immediately designed for specific incapacities, e.g. delivered meals for those who cannot prepare them. Such restriction is justified only because these questionnaires tend to focus on a very limited older population. When the older population in general is considered, it is necessary to examine a broader variety of services - in fact, all the services that might be used.

So far, the only multidimensional functional assessment questionnaire that has dealt fully with this issue is OARS. Twenty-four generically defined services have been identified - a broadly encompassing set (see Table 13). They are defined in terms of purpose, activity involved, examples of personnel who offer the service, and the unit in which the service may be measured. In addition, examples of the service are often provided. Three generically defined services have been selected to illustrate these points. Table 14 shows how they are defined, while Table 15 indicates the manner in which information is sought on receipt, quantity, provider and estimated need.

This information permits identification of the services currently used (i.e. the service package), forms the basis for determining service impact, and allows assessment of adequacy of current service provision and of requirement for further services. Additional work has been designed that will indicate the extent to which this set of 24 generically defined services is all-inclusive, while work currently in progress is focusing on service aggregation.
Table 13. OARS list of services

1. Transportation
2. Social/recreational services
3. Employment services
4. Sheltered employment
5. Educational services, employment-related
6. Remedial training
7. Mental health services
8. Psychotropic drugs
9. Personal care services
10. Nursing care
11. Medical services
12. Supportive devices and prostheses
13. Physical therapy
14. Continuous supervision
15. Checking services
16. Relocation and placement services
17. Homemaker-household services
18. Meal preparation
19. Administrative, legal and protective services
20. Systematic multidimensional evaluation
21. Financial assistance
22. Food, groceries
23. Living quarters (housing)
24. Coordination, information, and referral services
Table 14. OARS definitions of generic services, selected examples

<table>
<thead>
<tr>
<th>1. Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong> To provide access (outside of walking distance) to the community, e.g. to service providers, businesses, friends, leisure activities and special events.</td>
</tr>
<tr>
<td><strong>Activity:</strong> Transporting an individual from one place to another.</td>
</tr>
<tr>
<td><strong>Unit of measure:</strong> Passenger round trips.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Social/recreational services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong> To increase the quality and quantity of an individual's social interactions; to foster skills in making creative use of non-work time, including artistic and intellectual development.</td>
</tr>
<tr>
<td><strong>Activity:</strong> Social interaction and planned and organized activities (for either individuals or groups) to provide creative expression; physical, mental and intellectual development; or community involvement.</td>
</tr>
<tr>
<td><strong>Relevant personnel:</strong> Social worker, activity therapist, volunteer coordinator, social club personnel, recreation worker, occupational therapist, educational personnel, crafts teacher.</td>
</tr>
<tr>
<td><strong>Unit of measure:</strong> Sessions.</td>
</tr>
<tr>
<td><strong>Examples:</strong> Social clubs, recreation groups, church groups, hobby groups, special interest groups, volunteer projects, friendly visitors, adult education classes, craft course, speed reading, painting crafts, hobbies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. Physical therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong> To assist an individual in achieving partial or total use of some portion of the body which is not functioning normally.</td>
</tr>
<tr>
<td><strong>Activity:</strong> A planned set of physical exercises and/or massages and treatments.</td>
</tr>
<tr>
<td><strong>Relevant personnel:</strong> Physical therapist, individual (either professional or nonprofessional) who has been trained to administer and follow a set of prescribed exercises, e.g. attendant, nurse, family member.</td>
</tr>
<tr>
<td><strong>Unit of measure:</strong> Sessions.</td>
</tr>
</tbody>
</table>
Table 15. OARS services questions, selected examples

71. Now I want to ask you some questions about the kinds of help you are or have been getting or the kinds of help that you feel you need. We want to know not only about the help you have been getting from agencies or organizations, but also what help you have been getting from your family and friends.

TRANSPORTATION

(1) Who provides your transportation when you go shopping, visit friends, go to the doctor, etc.?

[CHECK "YES" OR "NO" FOR EACH]

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1</td>
<td>Yourself</td>
<td></td>
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<tr>
<td></td>
<td>Your family or friends</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use public transportation (bus, taxi, subway, etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public agency [SPECIFY]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other [SPECIFY]</td>
<td></td>
</tr>
</tbody>
</table>

(a) On average, how many round trips do you make a week?

0 None
1 Less than one a week
2 One to three a week
3 Four or more
- Not answered

(b) Do you feel you need transportation more often than it is available to you now for appointments, visiting, social events, etc.?

1 Yes
0 No
- Not answered

SOCIAL/RECREATIONAL SERVICES

(2) In the past six months (since [SPECIFY MONTH]) have you participated in any planned and organized social or recreational programmes or in any group activities or classes such as arts and crafts classes? [EXCLUDE EMPLOYMENT-RELATED CLASSES]

1 Yes
0 No
- Not answered

[IF "NO", SKIP TO (c). IF "YES", ASK (a), (b) AND (c)]

(a) About how many times a week did you participate in these activities?

1 Once a week or less
2 Two to three times a week
3 Four times a week or more
- Not answered

(b) Do you still participate in such activities or groups?

1 Yes
0 No
- Not answered
(c) Do you feel you need to participate in any planned and organized social or recreational programmes or in any group activities or classes?

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<tr>
<td>1</td>
<td>Yes</td>
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<tr>
<td>0</td>
<td>No</td>
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<td></td>
<td>Not answered</td>
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PHYSICAL THERAPY

(13) During the past six months, have you received physical therapy?

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<tbody>
<tr>
<td>1</td>
<td>Yes</td>
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<tr>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
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</table>

[IF "NO", SKIP TO (d). IF "YES", ASK (a), (b), (c) AND (d)]

(a) Who gave you physical therapy or helped you with it?

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Unpaid family members or friends</td>
</tr>
<tr>
<td>2</td>
<td>Someone hired to provide this or someone from an agency</td>
</tr>
<tr>
<td>3</td>
<td>Both</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
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</table>

(b) On average, how many times a week did someone help you with your physical therapy activities?

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<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>Less than once a week</td>
</tr>
<tr>
<td>2</td>
<td>Once a week</td>
</tr>
<tr>
<td>3</td>
<td>Two or more times a week</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
</tr>
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</table>

(c) Are you still receiving physical therapy?

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<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
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</table>

(d) Do you think you need physical therapy?

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<tbody>
<tr>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
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</table>
3. SOME EXAMPLES OF ALTERNATIVE FUNCTIONAL CLASSIFICATION SYSTEMS

Few questionnaires provide any guidelines for how the information they are designed to provide can be summarized and used. Some examples of those which do are presented here.

The first example is the New Zealand physical disability survey (54). It is included not only because of the functional classification system that was developed, but also because of its sampling design, the clarity of its presentation and the care taken to impart accurate information relevant to service providers.

The second example, drawn from Isaacs & Neville (52, 53), uses a somewhat more complex classification system and shows the importance of looking beyond the information gathered to understand what it implies and of conceptualizing it in a useful manner.

The third example is based on the OARS model (21). Here, a more inclusive functional classification system is developed, one which takes into account all levels of functioning in all major areas and which permits an entire population to be classified into a limited number of states. This system was specially developed to assess the impact of services on functional state using a non-intrusive, quasi-experimental approach.

Information gathered for one purpose is sometimes also useful for another. When that occurs, it may be cheaper and quicker to reanalyse available data than to carry out a new study. The fourth example is an illustration of this. It goes through the various steps involved in adapting the data of a major nationally representative longitudinal survey initially designed for other purposes, and the problems that had to be solved in analysing them. It should be noted that these problems arose because the data were more adequate than is typically the case for functional assessment surveys.

3.1 New Zealand physical disability survey (54)

The purpose of this survey was to determine the prevalence of physical disability in a specific geographical region and to permit accurate assessment of the likely demand for domiciliary and support services.

Since the locale of the physically disabled was not known, a two-stage sampling design was used. In the first stage, a 10% sample of households and of institutional residents was selected and sent a questionnaire, the responses to which indicated whether a physically disabled person was in the household or was an institutional resident. The physically disabled so identified were then individually contacted, and 96% were interviewed. Only persons aged five and over were included.

To check the representativeness of respondents, a sample of non-respondents was also contacted. Since the proportion of physically disabled among the non-respondents was similar to that among respondents, the latter were considered representative of the total group.

The second-stage questionnaire was designed to obtain information on the physical handicap and on the impact this had on the individual's life. Inquiry was therefore concerned with ascertaining the extent of dependence on others (and the effect on others of helping); medical treatment; mobility; aids and appliances used; alterations needed in the house; housing; transportation; social contacts, leisure pursuits and holidays; employment; education; expenses due to the handicap; capacity to perform specific household tasks (cooking, laundry, housework, etc.) and help received with these; and detailed information on services needed and received. Demographic data were also collected, as well as information on self-care capacity.

In analysing the data, the physically disabled were first classified into five distinct exhaustively inclusive and non-overlapping groups, defined in terms of problem duration and extent of difficulty. The latter was assessed with respect to self-care capacity score, ability to perform usual tasks (e.g. work, go to school), ability to walk unaided, and extent of sensory deficit. For some analyses, the five groups are reduced to two: impaired or handicapped. By definition (and in this study the terms used are very carefully defined), the impaired have a lesser problem than the handicapped.
The information obtained was coded, the coding was checked, keypunched and verified. The statistical package for the social sciences (SPSS) (76) was used for editing and analysis. Sampling error statistics are provided, together with specific instructions on how to use them, and their use is emphasized.

Data reporting starts by providing information on the physical disability prevalence rates per 1000 population, by sex, age and severity of condition. Attention then focuses on the particular community studied, and the number of physically disabled who live in the community is reported. Comparison is made with the results of other studies, and where differences in prevalence occur assessment of the reason for the discrepancy is offered. A significant problem that makes comparison across studies hazardous is the different definitions and measures of disability that have been used. These are rarely reconcilable. Unfortunately, this problem is not confined to physical disability.

The demographic characteristics of the sample are described. Information is provided in the text, in tables which give both raw numbers and percentages, and in charts. Thus, readers who have difficulty grasping information when it is presented in one way are offered an alternative.

Essentially, all the information collected is examined and reported. One receives the strong impression that the developers knew what was important and what was not, and concentrated on the former.

Only frequency tables and cross-tabulations are presented, e.g. information on illnesses, listed in terms of the International Classification of Diseases; severity of disability by sex, or by age group, or by use of aids. This is material that all readers can understand. The only drawback is that it makes estimation of service requirements difficult and may result in an overestimate of demand.

The information is presented in a logical order and concludes by laying out the policy implications of the findings. Specific recommendations are made regarding each area of inquiry. The reasons for those recommendations and the supporting evidence are provided. Thus, all information, in a form useful to a policy-maker, is available.

3.2 The measurement of need in old people (52, 53)

Isaacs & Neville (52, 53) are concerned with measuring the need of old people for those additional basic care services that will provide a satisfactory standard of food, warmth, cleanliness and security. They take into account the status of the individual and whether that individual is already being appropriately served. The latter is of fundamental importance in estimating how much service is already being provided and what is needed additionally.

They use information in two areas: ADL (both instrumental and physical ADL) and social support.

As regards ADL, their concern is not so much with the specific activities for which help is required as with relating this to the interval elapsing between the times when help is necessary. Three time intervals are identified:

(a) long interval, i.e. tasks that only need to be performed every 24 hours or less often; this includes many domestic tasks, such as shopping, household cleaning and laundry;

(b) short interval, i.e. tasks that must be performed every few hours by day but where exact time is not essential, e.g. providing food and drink;

(c) critical interval, i.e. tasks whose occurrence may be unpredictable and which must be attended to as soon as they occur, e.g. helping a person to go to the toilet, taking care of those who may be a danger to themselves or their environment.

Social support is measured on a 4-point scale (called a solitude rating) that reflects the length of time and time of day during which the subject is alone. Thus, the solitude rating is:
- minimal, less than 2 hours alone during the day and never alone at night;
- diurnal, 2-12 hours alone by day, never alone at night;
- nocturnal, less than 10 hours alone by day, alone all night;
- maximal, more than 10 hours alone by day, alone all night.

These two ratings (time interval and solitude) are then used to classify the elderly into 12 groups (three time intervals x four solitude ratings). To apply this system to the total population, it is only necessary to add one further group — those able to see to their own basic care needs.

Isaacs & Neville recognized that the presence of another person does not necessarily ensure that all basic care needs will be met and that for some care-givers the strain of trying to provide basic care will be unduly burdensome. Consequently, they also determined whether care-givers were experiencing undue strain. This, in effect, turns the 12-class system into a 24-class system (three time intervals x four solitude ratings x two levels of strain). This 24-class system permits accurate identification of the type of basic care services needed and can be used to assess additional requirements for basic personal care services in a total population. The foundation of this classification system — information on specific activities of daily living — indicates the particular matters in which a provider should have expertise, and so furnishes a concrete basis for selecting providers and developing training courses.

3.3 The OARS model

The OARS questionnaire is relevant at both clinical (individual) and population levels. It is possible to examine the responses given to any one question and use such information as a separate unit, e.g. to determine what proportion of the examined population is married, the types of living arrangements found, the percentage who have difficulty performing certain tasks or who cannot do the selected tasks at all. However, in addition to such specific, detailed information, this questionnaire provides a means of summarizing responses in each of five areas of functioning (social and economic resources, mental and physical health, and ADL) on a scale where the values range from 1 (denoting an excellent level of functioning) to 6 (denoting total impairment). These five ratings yield a profile showing concomitant functioning across the five areas, and so provide an overall view of the individual or population. This approach can be used with other questionnaires. An example of how it was applied to a questionnaire not initially developed to assess functional status — the United States Social Security Administration's LKHS — is given in section 3.4.

For clinical purposes, it may be important to maintain the distinctions indicated on a 6-point scale. For population purposes, it is not, for the resulting number of profiles ($6^5 = 7776$), too large and the distinctions between them are too small to permit useful planning. Aggregation, which will result in a small number of behaviourally distinct groups but which will nevertheless encompass the entire pattern of functioning present in a population, is necessary. There are various ways of doing this. The ratings on each of the five scales may be summed (the range for summed scores is from 5, indicating excellent functioning in each area, to 30, indicating total overall impairment). Such summed scores have been found to be useful in distinguishing those resident in institutions from those living in the community (9).

Alternatively, the number of areas of functioning that are impaired can be counted. To do this, it is first necessary to determine which level of functioning indicates impairment. Ratings of 1 and 2 may be combined and compared with ratings of 3-6 (i.e. non-impaired versus impaired) or the contrast may be between ratings of 1-3 and 4-6. Summed over areas, this yields a 6-class system (0 areas impaired ... 5 areas impaired). A classification based on a trichotomized scale ($1 + 2/3 + 4/5 + 6$) which takes into account both number of areas impaired and severity of impairment has also been developed (112).

However, a classification based on summed information assumes that areas are equivalent. While this may be true in some instances (it seems to be the case for institutionalization), we do not know whether it is so for all. Consequently, a functional classification system that maintains distinctions between areas may be preferred.

Such a system can be, and has been, developed using dichotomized scales. The five dichotomized scales yield 32 profiles or functionally equivalent classes. A functionally equivalent class is one within which all members have the same functional status. The
classes are described in the first column of Table 16. An upper-case letter represents adequate functioning (here ratings of 1, 2 or 3), while a lower-case letter represents inadequate functioning (here ratings of 4, 5 or 6). The functional classes are arranged according to the number of areas impaired, as indicated in the second column of the table.

Table 16. Proportion of community residence in each functional class

<table>
<thead>
<tr>
<th>Functional class</th>
<th>Number of areas impaired</th>
<th>Durham</th>
<th>Cleveland</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMPa</td>
<td>0</td>
<td>0.59</td>
<td>0.57</td>
</tr>
<tr>
<td>SEMPa</td>
<td></td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>SEMpA</td>
<td></td>
<td>0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>SEMpA</td>
<td>1</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>SEMpA</td>
<td></td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>SEMpA</td>
<td></td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>SEMPp</td>
<td></td>
<td>0.06</td>
<td>0.04</td>
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<td>SEMPp</td>
<td>*</td>
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Total number in sample

998

1609

a S = social
E = economic
M = mental health
P = physical health
A = ADL
Lower-case letters indicate impairment
* = less than 0.005
- = no representatives
Functional classes are arranged according to number of areas impaired
While the classes range from adequate functioning in all areas to inadequate functioning in all areas, they do not necessarily form an ordered scale, and no attempt has as yet been made to develop one. To do so would require socially and politically determined decisions regarding relative preference. It would, for instance, be necessary to determine whether, all else being equal, impairment in physical health is more or less desirable than impairment in mental health. In this respect, this model differs from a health index (e.g. 4, 5).

The third and fourth columns of Table 16 show how two random samples of community residents aged 65 and over are distributed across these 32 classes (70). Not included here is information on the approximately 5% of elderly persons in each city who are residents of institutions.

Examination of Table 16 shows that not all classes are equally represented. For both samples, the adequately functioning elderly are in the majority (59% of those in Durham, 57% of those in Cleveland). Over two thirds of these populations are represented by just three classes in the case of Durham (SEMPa, SEmpA, SEMpA) and two in that of Cleveland (SEMPa, SEmpA). Conversely, 12 classes in the case of Durham and 14 classes in that of Cleveland either are not found at all or represent a very small proportion of the elderly population. Obviously, some of the people minimally represented in the community are in institutions, e.g. those who would be classified into sempa.

This type of classification system is important in that it permits identification of the pattern of impairment present, and so indicates how services should be packaged. It is also useful in other ways. It has, for instance, been used to compare people living in different parts of the same country, a comparison which indicated that persons in certain areas enjoyed better functional status than did those in other areas, and that this was not necessarily linked to rural or urban residence (15). The reason for such a differential distribution remains to be determined. To take another example, the Cleveland survey found that members of the same functional class were living in different types of residential settings and doing so successfully. Cost estimation showed that if a larger number of the cheaper and less restrictive settings were provided, there could be substantial financial savings (95). Service providers have used information on functional class to determine whether they are serving the people it is incumbent on them to serve.

These examples refer to the use of cross-sectional information. The full strength of the OARS model, however, is in its longitudinal application. Cross-sectional information is useful in indicating overall functional status and, by implication, the type of service needed to maintain or improve that status. However, the question naturally arises whether the services provided have the desired effect. This can be examined in several ways. Separate random samples can be drawn before and after a particular intervention has been introduced and the results from the two compared. However, such an approach is useful only if the intervention was relevant to a large proportion of the group, e.g. the impact of changes in a universal pension system. If the intervention applies only to a few people, its impact will not be identified by such a procedure. In such a case, it is preferable to reassess the original group. To do this, the procedure preferred by the OARS model utilizes a transition matrix. The population to be studied is grouped into a limited number of functional classes, as described earlier, both initially and on reassessment. For each initial class, the proportion remaining in that class and the proportion moving to each of the other possible classes are noted, with an additional class being added on the second occasion to take into account those for whom no reassessment information is available. Thus, it is possible to see the transfers that occur. An example of such a transition matrix is given in Table 17. In order to determine the impact of an intervention, the table is drawn up twice, once on the basis of persons who received the intervention and once on the basis of those who did not. Either by observation or by using established statistical procedures (e.g. 8, 27, 35), it is possible to determine whether the intervention had a statistically significant impact. However, determination of whether that impact was desirable is a social and not a statistical matter.

When this approach is adopted, more than one intervention can be examined at a time. In addition, and importantly, this procedure can be used as a non-intrusive measure to assess the impact of services (or other intervention) received in the usual way. Since services tend to be linked to people, this in effect permits examination of the impact of diverse service packages without interfering with the current service provision mechanisms.
Table 17. Transition matrix: estimated transition probabilities from each 1969 state to each 1971 state for the LRNS sample

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Notes:
- S = social
- F = economic
- M = mental health
- N = physical health
- # = less than 0.01 of those in initial (1969) class transferred to this 1971 class
- * = cells on diagonal underscored

Source: Reference 21.
The United States Social Security Administration's LRHS was described briefly in section 1.2. Here, this survey is used as an example to show that at times it is possible to adapt data obtained for other purposes, and so reduce the need to carry out a special survey.

Examination of the LRHS questionnaire showed that there was substantial similarity between the items it contained and those in the OARS questionnaire. This suggested that it might be possible to develop for the LRHS an assessment of functional status comparable to that of OARS. Persons with expertise in the five areas of functioning measured in OARS (social, economic, mental health, physical health, ADL) were asked to scrutinize the LRHS questionnaire and indicate the items that they considered relevant to an assessment of functional status in the five areas selected. On the basis of the responses to these items, two highly experienced raters developed rating scales for each area comparable to those developed for OARS, although it was not always possible to develop all six points for each of the five scales. In the process, they discarded items that made no independent contribution. Internal validity was assessed by means of factor analysis, which was used to determine whether items assumed to measure status in a particular area did, indeed, fall in that area. Concurrent and criterion validity were assessed by administering the selected LRHS items and the OARS questionnaire to the same group of people and comparing the results, and also by comparing the findings of geropsychiatrists, physicians, associates and physical therapists, who examined these people in the areas of mental and physical health and ADL. As a result, the LRHS measure of mental health was considered to be inadequate—it seemed rather to be a measure of life satisfaction—but an acceptable standard was reached in the other areas. Since computer-based ratings were developed for LRHS, rating reliability was ensured. Subject response reliability was not examined, but it could have been if the LRHS items had been readministered after a short interval. We chose not to do so because of the already heavy testing load on these older subjects.

The information on functional status in the areas examined was used to develop a functional classification system or, rather, a number of such systems. For the first functional classification system, each 6-point rating scale was dichotomized, ratings of 1 and 2 being combined to indicate unimpaired functioning and ratings of 3-6 to indicate impaired functioning. All combinations of the resulting five 2-point scales yielded 32 functionally equivalent states, to which a thirty-third was added to take care of persons who had provided too little data to permit classification (see Table 17, left-most column). Examination of the proportions falling into each of the 32 functionally equivalent states indicated that some were very rare indeed, e.g., those where physical health is good, but ADL capacity is impaired. In order to examine changes over time, the functionally equivalent states on the first wave were cross-classified by state in the second wave; the proportion of the original class who had remained there and the proportion moving to each of the other classes were determined. From examination of Table 17, it was possible to see which states were stable and which were not, and for the latter, which states persons tended to move to. Movement was not inevitably in the direction of decline and many people improved.

Work with this table indicated that, for a longitudinal study, a 32-class system is unwieldy. The wave 1 by wave 2 cross-tabulation, i.e., cross-classification matrix, had 33 x 33 = 1089 cells. Clinically, this provides interesting information, but, unless the sample is extraordinarily large, a matrix of this size becomes difficult to handle statistically (because of the presence of empty cells) when further divided to see whether the functional status of men differs over time from that of women or to note the impact of alternative interventions.

Consequently, alternative classification systems were considered. In this particular sample, there was a substantial correlation between the physical health and ADL ratings, since items used in the latter were a subset of the former. It seemed justifiable to ignore ADL ratings (since no information would be lost) and to work with a classification system based on information in four instead of five areas, i.e., with 16 instead of 32 classes. With other samples, a quite different pattern of correlations among the areas examined might be found. The classification system should reflect this.
Since we were looking at information obtained over four waves, further cross-classified by an intervening event, we found it necessary to turn to a still less defined system. Few users, however, should encounter this problem, since it is rare to have access to four waves of data.

The alternatives which we considered were among those described earlier when a functional classification system was first discussed. Certain procedures—for instance, summing all the ratings—were obviously inappropriate, since it had not been possible to develop ratings on all six points for each of the five scales. A potential alternative was a classification system based on the number of areas in which a person was impaired. Given four areas (ADL had previously been dropped), this results in a system with five classes, to which one must be added to take account of persons who die in the interim or who cannot be classified. This, with slight modification, was the system which we finally adopted, the modification being to combine the three-areas-impaired and four-areas-impaired classes since the differences between the people concerned were minimal. Thus, we went from a 32-class system, which was extremely useful for up to two waves of data, to a very simple 5-class system, which was more appropriate for multivariate analysis. The technically inclined reader will find explanations of the statistical background and technical procedures in Bishop et al. (8), Fienberg (27), Goodman & Fay (35) and Landerman (63). The last is a simple exposition that was developed because the others were so complex.
4. DESIRABLE STANDARDS FOR MULTIDIMENSIONAL FUNCTIONAL ASSESSMENT AT THE POPULATION LEVEL

Any assessment used should be both valid and reliable. That is, it should measure what it claims to measure, and the measurement should be consistent.

4.1 Validity and reliability

While standards of validity and reliability have now been carefully specified in certain areas of test construction, e.g. for achievement tests and competency tests (1a), comparable guidelines have not yet been developed for measures of functional capacity.

Validity

The validity of an assessment is the extent to which it measures what it professes to measure. Three main types of validity are used to assess a test: content, criterion and construct.

Content validity refers to the extent to which the items included in a test cover the desired range of situations. Where assessment of a particular area of functioning is concerned, this means that it is necessary to specify the types of situation that should be considered if an adequate assessment is to be made. This, in turn, means that the conceptual issues related to each area must be clear. Thus, if different test developers vary in their conceptualization of issues, the content of the questionnaires they develop may differ markedly and may not necessarily agree with the conceptualization of the user. The user must then decide whether a particular questionnaire is appropriate for his or her purposes. Seen in this way, content validity reflects the extent of agreement in conceptualization between the questionnaire developer and the questionnaire selector. It says little, however, about the adequacy of the questionnaire as an appropriate measure, but it does demand that underlying concepts should be carefully and clearly specified. If a particular questionnaire is to assess economic status, it is essential to specify the concepts underlying the assessment of economic status and the manner in which they are conceptualized in the particular questionnaire. Content validity alone is not an adequate measure of validity.

Criterion validity is the single term now given to concurrent validity and predictive validity.

Concurrent validity refers to the extent to which the findings from one test agree with the findings from another administered at essentially the same time. The comparison—an accepted standard (criterion)—may be another test of the same type, e.g. an interviewer-administered structured questionnaire, or some other accepted means of assessment, e.g. unstructured or semistructured interviews by professionals. Some multidimensional questionnaires do not examine criterion validity, arguing that no suitable criterion exists for their purposes, e.g. RAND health insurance study questionnaire. Others, which are designed to have both clinical and populational application, are concerned to match their assessments to those which would have been made by a professional, e.g. OARS and indirectly CARE.

Users should carefully check the criterion used to determine whether it reflects their purposes. They should also be aware that to some extent agreement between test and criterion reflects the extent of similarity of the methods used by the two approaches. Comparison of one structured questionnaire with another may yield a higher level of agreement than comparison of a structured questionnaire with a professional assessment simply because the questionnaires share the same method.

Certain criteria offer particular problems in that they provide inconsistent information. Professionals, for instance, may well disagree with each other regarding diagnosis (39), so that poor agreement between questionnaire-based and professional-based assessment may reflect disagreements among professionals rather than the invalidity of the questionnaire.

It is rarely possible to obtain information simultaneously from both the criterion and the assessment procedure under investigation. However, the time interval between the two should be such that the possibility of a change in personal status between the two examining occasions is minimized. Certainly, if time does elapse between the examining occasions, an
attempt should be made to determine whether any event that could lead to a change in personal status has occurred and, if necessary, to take this into account.

Predictive validity focuses on the extent to which a future condition can be accurately predicted from assessment-based information. Since we currently know very little about change in functional status over time, this form of validity is rarely testable.

Construct validity is concerned with whether the concepts the questionnaire is said to measure can be shown to make scientific and conceptual sense (36). Thus, in a multidimensional functional assessment questionnaire, those items measuring status in the same area of functioning should be more highly correlated with each other and with a final summary score in that particular area (assuming that a summary score is present) than with items in any of the other areas or with the summary scores for those areas. This is the main form of validity relied on by the MAI and the RAND health insurance study questionnaire.

Reliability

Reliability is concerned with the extent to which the information obtained is accurate and dependable.

In the main, it has been assumed that respondents will answer as truthfully and as accurately as they are able. Two measures are often included in questionnaires to assess this: a screen which is intended to indicate whether the respondent is capable of understanding the questions and answering them (if not, information may be sought from an alternative source) and the interviewer's evaluation.

Although, typically, care has been taken to ensure that the questions are understood by those for whom they are intended, response accuracy has rarely been assessed. It is therefore necessary to assume that the accuracy of reporting is comparable to that found in studies that have specifically examined these issues. For illness and medical information, such studies include those cited in references 99-102, and for economic matters Ferber's work (26) may be consulted.

The main concern in assessing the reliability of structured multidimensional functional assessment questionnaires has been to determine the internal consistency of the scales present, the stability of the information obtained and, where final summaries are made by raters, inter- and intra-rater agreement.

Internal consistency of multi-item measures assesses the extent to which items on the same scale are interrelated and estimates the proportion of total measured variance represented in a score that is true score variance. The statistic typically used is Cronbach's alpha. When the measure is in the form of a Guttman scale (as is typical of some ADL measures), a special type of internal consistency analysis is used: the coefficient of reproducibility. Tests of reproducibility indicate whether items are unidimensional and whether a score can be produced by only one pattern of responses to items in the scale (12).

If stability is present, the same conditions should result in the same response and so yield the same evaluation. If this situation does not prevail, it is impossible to ascertain what is being measured. Stability is typically examined by readministering the assessment within an interval of time too brief for any notable changes to have occurred but sufficiently long that the second administration will not have been influenced by the first (or only minimally so). The higher the correlation between the responses on the two occasions, the more stable is the assessment. It should be noted that correlations for objective items are typically higher than those for subjective items.

While stability is desired over a short time interval, during which there has been no apparent change in functional status, it is not desired over a longer time interval, when it is evident that events have occurred that influence functional state. If the same score is obtained in this case, the measure is not sensitive and is not useful as a means of assessing change in status. Sensitivity has generally been assumed rather than measured. However, one way in which it has been examined is by seeing whether the assessment discriminates between persons expected to differ on functional status. Both MAI and OARS have been examined in this way and have been found capable of discriminating appropriately between persons in different settings with different problems. Another approach has been to determine whether the anticipated impact of treatment can be identified. This is the measure typically used by some of the scales adapted for CARE.
Inter- and intra-rater agreement

Some multidimensional assessment questionnaires try to provide the user with a means of aggregating the information collected. This is typically done in one of two ways: a statistically derived approach in which, for instance, particular responses are weighted in terms of factor scores, which are then added and constitute a summary score, and a more subjective approach in which raters are trained to assign particular scores to specific constellations of responses.

The former approach yields consistent scores, but this is not necessarily so for the latter. Where raters are asked to assign summary scores, care must be taken to ensure that (a) when presented with the same responses, different raters assign the same summary scores (i.e. inter-rater reliability), and (b) as time goes by, raters continue to rate in the same way (i.e. intra-rater reliability). Both CARE and OARS use rater-based summary scores (OARS also now has computer-based scores (33)). To the extent that information has been reported, inter- and intra-rater reliability are adequate. Any study that depends on raters' scores must take steps to ensure that inter- and intra-rater reliability are maintained.

The necessity of using a valid and reliable assessment and the strong preference in large-scale surveys for using a structured approach are well established. Once validity has been determined, users know what it is that they can measure. Reliability indicates that reliance can be placed on the information, and a structured approach ensures that information is gathered and recorded in a consistent manner, regardless of who obtains it or where it is obtained. This not only facilitates the technical aspects of survey data gathering but, more important, ensures that meaningful information is obtained which will not be casually dismissed.

4.2 Considerations underlying instrument selection and use

The selection of an instrument with established validity and reliability is strongly advocated, particularly since the alternative is the expensive one of developing a valid and reliable measure. There has for too long been an unfortunate tendency in the area of assessment to develop a new questionnaire or procedure every time a new study is undertaken or to select a questionnaire or scale and "modify" it somewhat. The general arguments put forward for this are that no really suitable instrument exists, that a tailored questionnaire is essential if the matters of interest are to be appropriately identified, and so on. Such arguments can rarely be substantiated. The validity and reliability of questionnaires developed in this manner are seldom determined. Consequently, it is rarely possible to be sure what they measure, and the information they contain may be meaningless. The most unfortunate aspect is that the information they do provide is relevant only to the study for which the questionnaire was developed. If the questions are not identical to those used elsewhere, they do not permit the growth of that accumulated evidence which constitutes the firm foundation for further knowledge.

We are not against the development of new questionnaires, but we do expect them to meet certain criteria:

- they should represent a distinct improvement on existing questionnaires;
- they should obtain important information in ways not previously used and/or in areas not previously properly examined;
- they should be valid and reliable.

Developing a new questionnaire is an expensive matter and not one to be undertaken lightly. For all these reasons, we strongly recommend that the valid and reliable questionnaires already in existence be considered carefully and, wherever feasible, adopted. As will be indicated below, there are problems even when this is done, but such problems may be minor compared with those of developing a new instrument with an acceptable standard. The use of an existing questionnaire will not divert resources from the main matter of concern (populational assessment); it will permit access to comparative population data and will result in the accumulation of useful information.

We fully recognize that, even when a questionnaire is designed to have general applicability, culture-based matters may intrude. USA-based IADL scales, for instance, ask about capacity to use the telephone, for nearly everyone in that country has one, but where telephones are less common this question would be inappropriate. The short portable mental status questionnaire (see section 2.2) asks for the mother's maiden name, but the level of
difficulty of this item may be very different in countries in which, on marriage, the woman joins her name to that of her husband as compared with those in which she takes his name and drops hers. Obviously, careful screening and pilot-testing are required before any questionnaire is selected. Nevertheless, cross-cultural studies are possible, and both CARE and OARS have shown them to be feasible.

In addition to being valid and reliable and, preferably, structured, the assessment should be suitable for use with both community residents and persons in institutions if population information is to be obtained. Thus, there must be a certain amount of flexibility regarding the source from which information may be sought, and alternative inexpensive and accurate ways of gathering the same information must be available. Typical ways of doing this include obtaining information from someone with a good knowledge of the subject (when the latter is unable to answer) and consulting available records (for persons in institutions). Obviously, since these alternative techniques can only be used to obtain objective information, a questionnaire that relies primarily on subjective information will not be useful in gathering information from the most impaired, and so should be avoided.

To assess change over time, the measure should be appropriate for repeated use. Thus, it should be as applicable at some later time as it is initially. For most areas of functioning, this is not a problem, but for areas in which standards may be socially determined - for instance, where economic matters are concerned - there may be difficulties.

The measure should be sensitive. It should be able to reflect change in functional state so that the impact of an intervention can be identified. This is a very difficult requirement to impose, particularly for an instrument intended for use at the population level, for it means that both gross and fine characterization must be possible.

The measure should, indeed, be multidimensional. Preferably, information on activities of daily living, mental and physical health, and social and economic resources should be present, with, additionally, information on the environmental situation and on the extent of help available from nonprofessional sources, i.e. from family, friends and neighbours.

Within each measured domain, some means of aggregating the information obtained should be available, preferably in the form of a summary score indicating status in each area. Additionally, since the main reason for a multidimensional assessment is to obtain an overall view of those being assessed, some means of aggregating the information from relevant areas must be available, or developed, so that relevant areas of functioning can be considered simultaneously. Some examples were given earlier.

While it is possible to gather information using procedures ranging from unstructured interviews to structured questionnaires, in large-scale surveys focusing on multidimensional status a structured approach is the most reliable. Such an approach ensures that all areas of functioning are covered in a uniform manner and provides an objective definition of matters included in each area. In addition, a well-designed structured questionnaire is the easiest to check for completeness and can be used with nonprofessional staff. When both item response and question location are precoded, transcription error is reduced and aggregation and comparison of data across studies are facilitated.

While many older people are quite capable of completing a self-administered questionnaire, some cannot do so because of language or literacy problems or because of various other handicaps. In order to obtain a higher rate of response, personal interview is therefore recommended.

There are varying opinions as to the preferred age, sex, etc., of interviewers: should they be young, middle-aged or elderly, male or female, student or professional, the same sex as the subject or a person of the other sex, the same race as the subject or someone of another race? Much, in fact, depends on who is available and at what cost. Before data gathering, interviewers should be carefully trained to ensure that questionnaire administration is uniform. The completeness, accuracy and source of the data that interviewers gather must be checked as soon as possible after the interview. The reported validity and reliability of a questionnaire depend on its being administered in the same manner as that in which it was tested. Departures from this may destroy its usefulness. Data-gathering difficulties may indicate the need for additional interviewer training, the clarification of items or the use of different interviewers. It goes without saying that under no circumstances should the fabrication of information by interviewers be tolerated.
4.3 Sampling

In order to obtain information relevant to the population at issue, it may be necessary to determine whether to try to contact the total population or just a sample. Contacting an entire population is expensive, but may be feasible when, as in a census, it is legally authorized. A population census, however, does not ensure that all members of the population will be reached. Some will be missed because their whereabouts are not known, others because they deliberately exclude themselves.

If a sample is selected, it should be such that the information provided is an accurate estimate of the information that would have been obtained had the entire population been contacted. Decisions regarding sampling require highly specialized knowledge, both with regard to sampling per se and to the facilities available, e.g. the availability and adequacy of population listings. An expert in this area should be consulted before the study begins. A straightforward and useful guide to the issues involved in sampling is a recent paper by Brown et al. (13).

In selecting a sample, decisions must be made regarding sample size (this is influenced both by statistical requirements and by cost factors) and whether to oversample certain groups, e.g. the very old and minority groups, in order to obtain more accurate information about their status and to permit comparisons at a higher level of statistical precision. Oversampling was recommended for the WHO study of health care of the elderly (104) in order to obtain appropriate numbers at higher ages. When oversampling is used, the sample must be appropriately weighted before population projections are made.

At times, further information is desired on a particular subgroup which can only be identified after initial information has been gathered. In such cases, sampling in two stages should be considered, the first stage acting as an identifying screen and the second focusing on the persons identified. The manner of doing this and of then translating the information back to the population can be quite complicated (see, for example, Henderson et al. (42)) but may be desirable in certain instances.

It cannot be overemphasized that very careful attention must be paid to obtaining a representative sample. If the sample is not representative, the findings may not be used to indicate the status of the population.

4.4 Data gathering

A decision has to be made not only regarding who should be interviewed but when to interview them. Some surveys use continuous data collection (e.g. the United States health interview survey), others use quarterly data gathering aggregated over a year (e.g. Kohn & White (62)), and yet others collect data in particular months. When data are gathered at a specific time of year, the potential effect of that time of year should be spelt out since it may influence both the availability and the status of subjects.

The persons to be included in the study having been identified, the next step is to invite them to participate. Opinions differ regarding the way in which this is best done. Suggestions include publicizing the study and its hoped-for outcome and engaging the cooperation of local leaders. Letters introducing or explaining the study are sometimes sent shortly before the interviewer is scheduled to come. Sometimes, particularly when the names and addresses of subjects are not known beforehand, interviewers may appear unheralded but carrying appropriate identification. Sometimes an appointment is preferred, sometimes not.

Inevitably, not everybody will be in or agree to participate when the interviewer calls. Decisions will have to be made regarding the number of repeat visits to be attempted, at what time of the day or on which day of the week (some people can best be reached in the evening or at the weekend) and, in the case of potential refusals, whether a different interviewer should be sent.

As much information as possible should be obtained from persons who refuse to participate (at least demographic data and place of residence), so that it is possible to find out whether those who refuse differ significantly from those who participate, and thus determine what their absence might imply for the study findings.
A large-scale survey requires careful administration to ensure that interviewers know who to interview, a system for checking completed interviews rapidly, and also a system for checking that interviews have been completed by the subjects selected. All procedures should be recorded for later reference. As guides to these procedures, it is useful to read the descriptions published in the reports of most large-scale studies (e.g. 62, 65, 105, 106).

4.5 Data preparation

Once gathered, information should be coded and prepared for analysis. We have already indicated that a completely precoded questionnaire is preferred. If necessary, the coding system can be worked out during a pilot study. Open-ended items are expensive because of the individual coding they require, and the coding may be unreliable because of the individual decisions that are sometimes necessary. Such items should, if possible, be avoided.

As far as possible, coding should be consistent and logical. Thus, we would recommend that, on questions where there are only two response alternatives (e.g. yes or no, present or absent), the positive response should be coded 1 (one) and the negative 0 (zero). It will then immediately be possible to interpret the mean, and recoding will not be necessary if the item is to be used as a "dummy variable" in analysis. Where the responses represent a scale (e.g. health is better, same or worse than that of others), we would recommend that coding values should be in a logical order, with higher values representing "more" of the item in question — for instance, health better (3), same (2), worse (1). Ordered coding, such as that indicated, is essential for many statistical analyses and makes interpretation easier and less prone to error.

Inevitably, some questions will not be answered. Careful attention should be paid to coding non-response. The reason for it should be coded (e.g. question inapplicable, question refused). Such codes should, as far as possible, be consistent across items and should be readily distinguishable from codes used to identify other types of response. Computer software packages are typically used for data analysis, and the codes selected must comply with the requirements of the software package. For instance, in SAS (41), it is appropriate to use alphabetical symbols to identify non-responses, but they would not be a desirable choice with SPSS (77).

Once checked and coded, the data need to be made ready for analysis. The precise manner in which this is done must depend on the facilities available. However, care must be taken to ensure that information is recorded accurately. One way of doing this is to enter the data twice and to check against the original record when discrepancies occur. This, of course, does not identify identical errors made on both entry occasions. Scores that are out of range, i.e. codes not assigned to a specific question, can be readily identified and corrected by means of a computer programme. Identification of other errors is more difficult. Examination of response frequencies (bearing in mind what distribution seems reasonable, since the actual distribution may not be known) and cross-tabulating selected variables where certain responses on one variable must coincide with certain responses on another (e.g. sex and sex-specific disorders — prostate problems should only be found among males) may also be valuable. In practice, data input errors may only be identified during data analysis. It is as well to be sceptical about unexpected findings and to check whether they are attributable to coding or to input error.

4.6 Analysis

Analysis should be as simple as possible, contingent on providing maximally useful information. Thus, for some purposes, it may be both adequate and appropriate to provide a frequency distribution (e.g. on the living arrangements of members of the sample) or a simple cross-tabulation (e.g. cross-tabulating age by sex to examine change in sex ratio with age). Often, however, relationships are much more complex than can easily be illustrated by such approaches, with a particular matter being affected by many interacting factors. Living arrangements, for instance, may vary as a function of age, marital status, economic status, ADL capacity and social resources. In order to determine the relative importance of these factors, it is necessary to consider them simultaneously. This requires a multivariate approach. The functional classification system described earlier represents one type of multivariate approach. The approach finally selected, however, must depend on the question to be answered and the character of the data available to answer it. While
analysis is now considerably facilitated by the availability of computer software packages, a statistician should be consulted to ensure that the appropriate statistical procedure is used.

The procedure selected should be identified and explained as briefly and clearly as possible so that readers will know how to interpret the information. For clear descriptions of statistical procedures, see, for example, Dunn (23), describing a linear model, and Thompson (96), describing multiple classification analysis.

4.7 Data reporting

In reporting the data gathered, the target population should be identified clearly and the precise manner of sample selection should be described fully. The type of sample sought (e.g. stratified, random), the proportion of the population represented, and the weights needed to arrive at population values should be reported. The extent to which the sample selected represents the population of interest should be determined. For instance, if the registration rolls used as a sampling base were old, the sample obtained would be somewhat biased, and the type of bias should be indicated.

If a sample is being used, estimated population characteristics will differ somewhat from those that would have been obtained in a complete survey. The standard error of the estimate, for both number of persons and percentages, should be provided so that the reader may realize that reported findings and recommendations have some connected error, but that they are likely to fall within a particular specified range (see, for example, Bond (11, pp. 120 and 121)).

Since all members of the sample will not participate, reasons for non-participation should be reported, e.g. death, relocation, included in error. The extent to which those participating are representative of those initially selected should be indicated. If the final sample obtained is not representative of that selected, very careful attention should be paid to determining how it can be made representative.

4.8 Presentation of results

Results should be presented as clearly as possible. By reading the text or looking at tables or figures, the reader should be able to understand and, if appropriate, check and reanalyse the information provided. While it is conventional to explain findings both in text and in tables, additional visual display may help to emphasize certain findings. Tables should be clearly labelled, with rows ordered logically. Where frequency or cross-tabulation tables are concerned, the numbers for each cell rarely need be reported. It is usually preferable to report percentages together with the total number on which they are based, since comparison across categories is then facilitated. Consider, for instance, Table 18, taken from Motley (74). The title indicates the table content concisely. The main headings are laid out clearly. Their related subheadings are obvious. Both sample size and number of persons answering the question are given. Data are reported as percentages, the values given being rounded to whole numbers. The typographical layout reflects the order of inquiry. In particular, the additional indentation indicates that certain items (the last four) are asked only of persons answering the immediately previous item affirmatively. As a graphic example, consider the chart (Fig. 1) taken from Schwab (91), which permits simultaneous observation of information on three variables - type of longest job, work limitation and race - and from which it is immediately obvious that a larger percentage of blacks not in the labour force have health-imposed work limitations than is the case for whites and that fewer are without such limitations.

Other means of presenting data clearly are available (graphs, pie diagrams, illustrations, etc.). They should be used to the extent necessary to present or illustrate findings. For a summary of approaches to useful graphic presentation of data, see Wainer & Thissen (107).

4.9 Archive

Finally, some thought should be given to data storage, i.e. placing the raw data in some accessible archive and making it publicly available so that its continued use is facilitated.
<table>
<thead>
<tr>
<th>Extent of mobility limitation</th>
<th>Total</th>
<th>Men, spouse present</th>
<th>Men, no spouse present</th>
<th>Women, no spouse present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (in thousands):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6800</td>
<td>4117</td>
<td>1506</td>
<td>1356</td>
</tr>
<tr>
<td>Reporting on disability</td>
<td>6771</td>
<td>4105</td>
<td>1505</td>
<td>1349</td>
</tr>
<tr>
<td>Percentage reporting on disability</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>No limitation</td>
<td>61</td>
<td>63</td>
<td>67</td>
<td>62</td>
</tr>
<tr>
<td>Mobility limitation only</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Work limitation</td>
<td>35</td>
<td>33</td>
<td>29</td>
<td>34</td>
</tr>
<tr>
<td>Able to board a bus unassisted</td>
<td>27</td>
<td>26</td>
<td>23</td>
<td>27</td>
</tr>
<tr>
<td>Needs help to board a bus</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Needs help to go outside house</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Is bedridden or housebound</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Chart 4. Percentage of men aged 58-63 out of the labour force, by type of longest job, by presence or absence of health-imposed work limitations, and by race.
5. CONCLUDING REMARKS

If policy formulation with regard to the elderly is to rest on a secure and rational basis, sound information about them is essential. We have tried to present information that will help a policy-maker to decide:

- what kind of information is needed properly to assess the status of older members of the population;
- what that information should consist of;
- what level of detail is appropriate;
- what standards the assessment should meet;
- how best to obtain information;
- how the information should be handled, analysed and presented.

When the elderly experience problems, these tend to be in multiple areas. Consequently, a multidimensional assessment is preferred, and the analysis should reflect this. The areas typically assessed include activities of daily living, mental and physical health, and social and economic resources. Environmental issues and matters related to service provision also merit consideration. In addition, since concern must be with care and not solely with cure, assessment should reflect functional status. Several multidimensional assessments have been briefly described; some are designed to assess functional status, others could be so adapted. They are not equally suitable for population surveys or for cross-national or cross-cultural use.

To be appropriate for use at the population level, an assessment rarely needs to go into fine detail. It is sufficient if it permits gross characterization of the population in a way that can be related to major service areas. At the same time, the assessment and characterization should be of sufficient sensitivity that the impact of a policy-based intervention can be assessed.

All information gathered should be relevant to the question at issue. Extraneous "interesting" information should not be sought. The information gathered must be valid and reliable, and the persons from whom it is gathered must be representative of the group for whom a policy is to be made. While valid and reliable information gathered from a representative sample will not ensure that attention is paid to the findings, the absence of these characteristics may provide substantial grounds for dismissing findings and attacking policy based on them.

Most multidimensional assessments used in large-scale surveys are interviewer-administered, structured, precoded questionnaires, which permit the use of proxy-based information. These approaches guarantee comparability of administration, so maintaining validity and reliability; they ensure that information can be obtained from all the persons from whom it is sought, reduce coding and transcription errors and facilitate data aggregation, comparison and analysis.

Questionnaires reflect the state of the art at the time they were developed. While we strongly advocate that an already developed assessment should be selected (the alternative is to develop one - a lengthy and expensive task that may detract from the policy-maker's goal and contribute little), policy-makers should be aware of the main areas of functioning deserving examination, their desired content, the standards they should meet and current advances. Appropriate demands may then be made of an assessment instrument and its potential level of performance better understood.

Questionnaires also reflect the cultural context in which they are developed. While concepts can typically be transferred from setting to setting, this is not necessarily so of content. For instance, in the economic area, it may be possible to agree on what constitutes an adequate economic state and on the general manner in which this should be measured, but precise details of questioning may have to vary from setting to setting. While the economic area may obviously be the most problematic, to some extent the same holds true of all areas. Thus, if the questionnaire is to be relevant, some adaptation of content may be essential. Whatever adaptation is made, however, it should be such as to maintain the underlying concepts.
Gathering information involves a substantial commitment and expense. To reduce costs, only information that is relevant, needed and destined to be analysed should be gathered. Reduction beyond this point may be foolhardy, for it is even more expensive not to gather information that is necessary.

These ponderous issues notwithstanding, obtaining sound policy-relevant information should not be considered a difficult and complex task dependent on specialists. Rather, it should be viewed as a challenge, best met by understanding what kind of information is needed, and for what purpose, and by using sound common sense and as simple an approach as possible.

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ANNEX 1

"KATZ" PADL AND OARS IADL AND PADL SCALES

A. "Katz" PADL Scale

Name ........................................ Day of evaluation ......................

For each area of functioning listed below, check description that applies.
[The word "assistance" means supervision, direction or personal assistance.]

**Bathing** (either sponge bath, tub bath or shower)

- Receives no assistance (gets in and out of tub by self if tub is usual means of bathing)
- Receives assistance in bathing only one part of the body (such as back or a leg)
- Receives assistance in bathing more than one part of the body (or not bathed)

**Dressing** (gets clothes from closets and drawers, including underclothes, outer garments and using fasteners, including braces if worn)

- Gets clothes and gets completely dressed without assistance
- Gets clothes and gets dressed without assistance except for assistance in tying shoes
- Receives assistance in getting clothes or in getting dressed or stays partly or completely undressed

**Toileting** (going to the "toilet room" for bowel and urine elimination, cleaning self after elimination and arranging clothes)

- Goes to "toilet room", cleans self and arranges clothes without assistance (may use object for support, such as cane, walker or wheelchair and may manage night bedpan or commode, emptying same in morning)
- Receives assistance in going to "toilet room" or in cleansing self or in arranging clothes after elimination or in use of night bedpan or commode
- Does not go to room termed "toilet" for the elimination process

**Transfer**

- Moves in and out of bed as well as in and out of chair without assistance (may be using object for support, such as cane or walker)
- Moves in and out of bed or chair with assistance
- Does not get out of bed

**Continence**

- Controls urination and bowel movement completely by self
- Has occasional "accidents"
- Supervision helps keep urine or bowel control, catheter is used or is incontinent

**Feeding**

- Feeds self without assistance
- Feeds self except for getting assistance in cutting meat or buttering bread
- Receives assistance in feeding or is fed partly or completely by using tubes or intravenous fluids

---

The Index of independence in activities of daily living is based on an evaluation of the functional independence or dependence of patients in bathing, dressing, going to toilet, transferring, continence and feeding. Specific definitions of functional independence and dependence appear below the index.

A - Independent in feeding, continence, transferring, going to toilet, dressing and bathing
B - Independent in all but one of these functions
C - Independent in all but bathing and one additional function
D - Independent in all but bathing, dressing and one additional function
E - Independent in all but bathing, dressing, going to toilet and one additional function
F - Independent in all but bathing, dressing, going to toilet, transferring and one additional function
G - Dependent in all six functions

Other - Dependent in at least two functions, but not classifiable as C, D, E or F

Independence means without supervision, direction or active personal assistance, except as specifically noted below. This is based on actual status and not on ability. A patient who refuses to perform a function is considered as not performing the function, even though he is deemed able.

**Bathing** (sponge, shower or tub)

Independent: assistance only in bathing a single part (as back or disabled extremity) or bathes self completely

Dependent: assistance in bathing more than one part of body; assistance in getting in or out of tub or does not bathe self

**Transfer**

Independent: moves in and out of bed independently and moves in and out of chair independently (may or may not be using mechanical supports)

Dependent: assistance in moving in or out of bed and/or chair; does not perform one or more transfers

**Dressing**

Independent: gets clothes from closets and drawers; puts on clothes, outer garments, braces; manages fasteners; act of tying shoes is excluded

Dependent: does not dress self or remains partly undressed

**Continence**

Independent: urination and defecation entirely self-controlled

Dependent: partial or total incontinence in urination or defeation; partial or total control by enemas, catheters or regulated use of urinals and/or bedpans

**Going to toilet**

Independent: gets to toilet; gets on and off toilet; arranges clothes; cleans organs of excretion (may manage own bedpan used at night only and may or may not be using mechanical supports)

Dependent: uses bedpan or commode or receives assistance in getting to and using toilet

**Feeding**

Independent: gets food from plate or its equivalent into mouth (precutting of meat and preparation of food, as buttering bread, are excluded from evaluation)

Dependent: assistance in act of feeding (see above); does not eat all or parenteral feeding
B. OARS IADL and PADL scales

OARS IADL

Now I would like to ask you about some of the activities of daily living, things that we all need to do as a part of our daily lives. I would like to know if you can do these activities without any help at all or if you need some help to do them, or if you cannot do them at all.

[BE SURE TO READ ALL ANSWER CHOICES IF APPLICABLE IN QUESTIONS 56-69 TO RESPONDENT.]

Instrumental ADL

CARD 4

56. Can you use the telephone

2 Without help, including looking up numbers and dialling
1 With some help (can answer phone or dial operator in an emergency, but need a special phone or help in getting the number or dialling)
0 Or are you completely unable to use the telephone?
- Not answered

57. Can you get to places out of walking distance

2 Without help (can travel alone on buses, taxis or drive your own car)
1 With some help (need someone to help you or go with you when travelling)
0 Or are you unable to travel unless emergency arrangements are made for a specialized vehicle, like an ambulance?
- Not answered

58. Can you go shopping for groceries or clothes
[ASSUMING S HAS TRANSPORTATION]

2 Without help (taking care of all shopping needs yourself, assuming you had transportation)
1 With some help (need someone to help you on all shopping trips)
0 Or are you completely unable to do any shopping?
- Not answered

59. Can you prepare your own meals

2 Without help (plan and cook full meals yourself)
1 With some help (can prepare some things but unable to cook full meals yourself)
0 Or are you completely unable to prepare any meals?
- Not answered

60. Can you do your housework

2 Without help (can scrub floors, etc.)
1 With some help (can do light housework but need help with heavy work)
0 Or are you completely unable to do any housework?
- Not answered

---

61. Can you take your own medicine
   2 Without help (in the right doses at the right time)
   1 With some help (able to take medicine if someone prepares it
      for you and/or reminds you to take it)
   0 Or are you completely unable to take your medicines?
      - Not answered

62. Can you handle your own money
   2 Without help (write checks, pay bills, etc.)
   1 With some help (manage day-to-day buying but need help with
      managing your checkbook and paying your bills)
   0 Or are you completely unable to handle money?
      - Not answered

OARS PADL
Physical ADL

CARD 4

63. Can you eat
   2 Without help (able to feed yourself completely)
   1 With some help (need help with cutting, etc.)
   0 Or are you completely unable to feed yourself?
      - Not answered

64. Can you dress and undress yourself
   2 Without help (able to pick out clothes, dress and undress
      yourself)
   1 With some help
   0 Or are you completely unable to dress and undress yourself?
      - Not answered

65. Can you take care of your own appearance, e.g. combing your hair
    and (for men) shaving
   2 Without help
   1 With some help
   0 Or are you completely unable to maintain your appearance
      yourself?
      - Not answered

66. Can you walk
   2 Without help (except with a cane)
   1 With some help from a person or with the use of a walker or
      crutches, etc.
   0 Or are you completely unable to walk?
      - Not answered

67. Can you get in and out of bed
   2 Without any help or aids
   1 With some help (either from a person or with the aid of some
      device
   0 Or are you totally dependent on someone else to lift you?
      - Not answered
68. Can you take a bath or shower
   
   2 Without help
   1 With some help (need help getting in and out of the tub or need special attachments on the tub
   0 Or are you completely unable to bathe yourself?
   - Not answered

69. Do you ever have trouble getting to the bathroom on time?
   
   2 No
   1 Yes
   0 Have a catheter or colostomy
   - Not answered

[IF "YES", ASK (a)]

(a) How often do you wet or soil yourself (either day or night)?
   
   1 Once or twice a week
   0 Three times a week or more
   - Not answered
## ANNEX 2

### SELECTED SYMPTOMATOLOGY LISTS

#### A. Kilpsyth Questionnaire, Physical Health Section

*Medical questions*

"Other" is the last section in each system and allows for further comments or symptoms.

<table>
<thead>
<tr>
<th>Reference number</th>
<th>Joints</th>
<th>Gastrointestinal and Skin</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Q(a) Do you get rheumatic pains or joint pains? If YES, which joints?</td>
<td>Q Do what is your appetite like? If poor, why? For how long?</td>
</tr>
<tr>
<td></td>
<td>Q(b) Do you get backache?</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Q How much does this trouble you (joints and back)?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q What does it prevent you doing?</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Q Do your joints flare up?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q Have you had an attack in the last month? If YES, detail</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>OTHER</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Q Weight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ring reference number if change; detail over what period</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Q Do you get indigestion or heartburn?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q Do you get any other stomach troubles, such as pain or discomfort? If YES: Q When? Is it (a) before food? (b) after food? Q How often? Q How long have you had these troubles? Q What do you take for it?</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Q Have you vomited recently?</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Reference number</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 Q</td>
<td>Are you more thirsty than you used to be? If YES, when did you notice this?</td>
</tr>
<tr>
<td>14 Q</td>
<td>Have your bowel habits changed lately? If YES, in what way?</td>
</tr>
<tr>
<td>Q</td>
<td>Is the bowel alternately constipated and loose? If YES, for how long?</td>
</tr>
<tr>
<td>15 Q</td>
<td>Have you ever passed blood from the back passage? If YES, when was the last time?</td>
</tr>
<tr>
<td>Q</td>
<td>Have you ever passed black, tarry motions? If YES, when was the last time?</td>
</tr>
<tr>
<td>16 Q</td>
<td>Do you have piles or itching round the back passage? If YES, for how long?</td>
</tr>
<tr>
<td>17 Q</td>
<td>Do you have a rupture? If YES: Which side? Do you use a truss?</td>
</tr>
<tr>
<td>18 Q</td>
<td>Do you get boils on the skin?</td>
</tr>
<tr>
<td>Q</td>
<td>Do you have any itching or other skin troubles?</td>
</tr>
<tr>
<td>19 OTHER</td>
<td></td>
</tr>
</tbody>
</table>

**GENITO-URINARY**

| 20 Q(a)          | Do you have pain or difficulty when passing water?                      |
| Q(b)             | Do you have to pass water more than usual during the day?               |
| Q(c)             | Do you have to get up more than once in the night?                      |

| 21 Q             | Have you ever noticed blood in your water? If YES, when was the last time? |

22 Note if subject is incontinent: day/night/both: urine/faeces

**QUESTIONS FOR MALES WITH DIFFICULTY IN PASSING URINE**

| 23 Q(a)          | Do you have to wait for the stream to start?                           |
| Q(b)             | Is it a poor stream?                                                  |
| Q(c)             | At times, do you have to rush to pass water?                           |
QUESTIONS FOR ALL FEMALES

24 Q(a) If you laugh or cough, does the water come away? If YES: 
Q(b) Does this bother you (ring reference number if YES to (b))

25 Q(a) Do you have any bleeding or discharge from the front passage? (Note: ANY bleeding is significant) 
Q(b) Do you have itching round the front passage? 
Q(c) Do you have the feeling of something coming down - a prolapse?

26 Q(a) Have you ever felt a lump in your breast? 
Q(b) Or had discharge from the nipple?

27 OTHER

CARDIORESPIRATORY

28 Q Do you smoke? If YES: Q How many cigarettes per day? 
Q (pipe) How many ounces of tobacco per week?

29 Q(a) Do you get short of breath when walking up a slight hill? If YES: Q When walking on the flat at your own pace? 
Q When washing or dressing? 
Q Has this been getting worse recently? 
Q(b) Do you ever wake up in the night short of breath? Health visitor's observation: is the subject breathless on slight exertion or at rest? 
(A positive answer to Q.1 only indicates a mild or doubtful symptom OR the subject is controlled satisfactorily with current therapy.)

30 Q(a) Do you have a cough? If YES: Q For how long? 
Q Has it become worse lately? 
Q Have you any spit? Colour. Amount daily (e.g. eggcup full) 
Q(b) Have you ever coughed up blood? If YES, when was the last time?

31 Q Do you get any pain, discomfort or tightness in the chest? If YES, is it when you hurry or walk uphill?

32 Q Do your ankles ever swell? One, both, for how long?
33 Q Do you have varicose veins which bother you?

34 Q Do you get pain in either leg when walking (exclude joint pain)?
If YES, is it relieved by rest?

35 OTHER

CENTRAL NERVOUS SYSTEM

36 Q Do you often get headaches?
If YES: Q How often do you get them?
Q Have they started within the last year?
Q Where do you get them (generalized, frontal, occipital, other)?

37 Q(a) Are you unsteady on your feet?
Q(b) Do you have difficulty with your balance when walking?
If YES, for how long?
Q(c) Have you lost confidence in walking?
If YES, why (detail verbatim if possible)?
Q(d) Do you ever get giddy or feel dizzy?
Q(e) Have you had any fainting turns in the last year?
If YES, frequency?

38 Q Have you had any falls in the last year?
If YES, details and frequency.

39 OTHER

MENTAL HEALTH

(Ideally, the subject should be interviewed alone.)

40 Q Are you troubled with your nerves (if the subject queries the meaning of "nerves", suggest "worked up, "worrier" or "anxious type")?

41 Q(a) Do you often get depressed or fed up with life?
Q(b) Do you ever feel so depressed that you just sit for hours on end?
If YES to questions (a) or (b), ask questions (c), (d) and (e).
Q(c) Have you lost interest in things?
Q(d) Does the future seem pointless?
Q(e) Do you ever go to bed feeling that you would not care if you never woke up again?
B. **RAND HIS**

Symptoms list

160. During the **past 30 days**, did you have any of the following symptoms? If you did have the symptom, did you see a doctor about it?

Please circle one number on each line:

1 - You did not have the symptom at all in the past 30 days
2 - You had the symptom but did not see a doctor about it
3 - You had the symptom and you did see a doctor about it

During the **past 30 days**, did you have:  

<table>
<thead>
<tr>
<th>During the past 30 days, did you have:</th>
<th>No, did not have this</th>
<th>Had it but did not see a doctor</th>
<th>Had it and saw a doctor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. A cough, without fever, which lasted at least 3 weeks</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>B. A sore throat or cold, with fever, lasting more than 3 days</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>C. A weight loss of more than 10 pounds (unless you were dieting)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D. An upset stomach for less than 24 hours</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>E. Stiffness, pain or swelling of joints, lasting more than 2 weeks</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>F. Backaches or sciatica</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>G. Trouble falling asleep at night</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>H. Getting up exhausted in the mornings, even with the usual amount of sleep</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>I. A skin rash or breaking out on any part of the body</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>J. Shortness of breath with light exercise or light work</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>K. Chest pain when exercising</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>L. Your nose stopped up or sneezing or allergies for 2 weeks or more</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

---

*a Reproduced from the RAND HIS, green form; for conceptualization, see Brook, R.H. et al. Overview. In: Conceptualization and measurement of health for adults in the health insurance study. Santa Monica, CA, Rand Corporation, 1979, Vol. 8.*
<table>
<thead>
<tr>
<th>During the past 30 days, did you have:</th>
<th>No, did not have this</th>
<th>Had it but did not see a doctor</th>
<th>Had it and saw a doctor</th>
<th>DO NOT WRITE IN THIS SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. Swollen ankles when you wake up</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>38/</td>
</tr>
<tr>
<td>N. Headaches almost every day</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>39/</td>
</tr>
<tr>
<td>O. A cough without fever, which lasted for less than a week</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>40/</td>
</tr>
<tr>
<td>P. Loss of consciousness, fainting or passing out</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>41/</td>
</tr>
<tr>
<td>Q. Acid indigestion or heartburn after many meals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>42/</td>
</tr>
<tr>
<td>R. A sprained ankle, but you could still walk</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>43/</td>
</tr>
<tr>
<td>S. A toothache (did you see a dentist for this?)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>44/</td>
</tr>
<tr>
<td>T. Stomach &quot;flu&quot; or virus (gastro-enteritis) with vomiting or diarrhoea</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>45/</td>
</tr>
<tr>
<td>U. Bleeding (other than nose bleed or periods) not caused by accident or injury</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>46/</td>
</tr>
<tr>
<td>V. An eye infection</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>47/</td>
</tr>
<tr>
<td>W. Feeling nervous or anxious most of the time</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>48/</td>
</tr>
<tr>
<td>X. Feeling depressed or sad most of the time</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>49/</td>
</tr>
<tr>
<td>Y. Men only: difficulty passing urine or prostate trouble</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>50/</td>
</tr>
<tr>
<td>Z. Women only: difficulty controlling urine or bladder or kidney problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>51/</td>
</tr>
<tr>
<td>AA. Women only: irregular periods or bleeding between periods</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>52/</td>
</tr>
</tbody>
</table>
Apart from this, I would like to ask you some additional questions about your health.

146. Do you usually bring up any phlegm from your chest the first thing on getting up on a winter morning?  
   □ No  
   □ Yes  

147. Do you usually bring up any phlegm from your chest during the day or at night in the winter time?  
   □ No  
   □ Yes  

148. Do you bring up phlegm like this on most days or nights for as much as three months each year?  
   □ No  
   □ Yes  

149. In the last three years have you had a period of (increased) cough and phlegm lasting for three weeks or more?  
   □ No  
   □ Yes  

150. Have you ever had any pain or discomfort in your chest?  
   □ No  
   □ Yes  

150A. Have you ever had any pressure or heaviness in your chest?  
   □ No  
   □ Yes  

151. Do you get it when you walk uphill or hurry?  
   □ No  
   □ Yes
   [Record yes if either walking uphill or hurrying causes pain or discomfort.]

151A. Do you get it when you walk at an ordinary pace on the level?  
   □ No  
   □ Yes

151B. Do you get it when you walk at an ordinary pace on the level?  
   □ No  
   □ Yes

152. What do you do if you get it while you are walking?  
   □ Stop or slow down, 
   □ Carry on

153. If you stand still, what happens to it?  
   □ Not relieved  
   □ Relieved  

153A. How soon?  
   □ 10 minutes or less, or  
   □ More than 10 minutes

154. Will you show me where it was?  
   □ No  
   □ Yes

   1. Sternum (upper middle)  
   2. Sternum (lower)  
   3. Left anterior chest  
   4. Left arm  
   5. Other

   [For codes: Codes for combinations]
   05-1.2 11-1.5 17-1.5 23-1.5 29-1.5 
   04-1.2 10-1.5 16-1.5 22-1.5 28-1.5 
   03-1.2 13-1.5 19-1.5 25-1.5 31-1.5 
   02-1.2 15-1.5 21-1.5 27-1.5 33-1.5 
   01-1.2 17-1.5 23-1.5 29-1.5 35-1.5 

---

### APPENDIX C

154A. Do you feel it anywhere else?  
- No  
- Yes  

155. Have you had this (pain or discomfort) (pressure or heaviness) in your chest within the last three months?  
- No  
- Yes  

156. Have you ever had pain in any joints?  
- No  
- Yes  

156A. Have you had such pain within the last three months?  
- No  
- Yes  

157. Do you wake up with stiffness or aching in your joints or muscles?  
- No  
- Yes  

157A. Do you wake up with stiffness or aching in your joints or muscles?  
- No  
- Yes  

158. How long does it last...  
- Less than 10 minutes,  
- 10 minutes to less than 30 minutes,  
- 30 minutes or more?  

158A. How long does it last...  
- Less than 10 minutes,  
- 10 minutes to less than 30 minutes,  
- 30 minutes or more?  

159. Have you ever had arthritis or rheumatism, or any other disease of that type?  
- No  
- Yes  

159A. Have you ever had arthritis or rheumatism, or any other disease of that type?  
- No  
- Yes  

160. Have you ever had swelling in any joints?  
- No  
- Yes  

160A. Have you ever had swelling in any joints?  
- No  
- Yes  

161. Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?  
- No  
- Yes  

162. Do you get short of breath walking with other people of your own age on level ground?  
- No  
- Yes  

162A. Do you have to stop for breath when walking at your own pace on level ground?  
- No  
- Yes  

163. Have you had this complaint within the last three months?  
- No  
- Yes  

[Go to chart]
<table>
<thead>
<tr>
<th>CHART</th>
<th>A. Phlegm</th>
<th>B. Chest (pain) (pressure)</th>
<th>C. Joint pain</th>
<th>D. Shortness of breath</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>164. Within the last three months has this (phlegm) (chest pain, pressure) (joint pain) (shortness of breath) bothered you</strong></td>
<td></td>
<td>164.</td>
<td>170.</td>
<td>176.</td>
</tr>
<tr>
<td>(i) a great deal,</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>(ii) somewhat,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) hardly at all, or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iv) not at all,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(v) Don't know,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>165. Within the same three months, were you concerned or worried about this</strong></td>
<td></td>
<td>165.</td>
<td>171.</td>
<td>177.</td>
</tr>
<tr>
<td>(i) a great deal,</td>
<td>✓</td>
<td>◯</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>(ii) somewhat,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) hardly at all, or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iv) not at all,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(v) Don't know,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>166. Did you (talk with) (consult) (visit) a doctor about this?</strong></td>
<td></td>
<td>166.</td>
<td>172.</td>
<td>178.</td>
</tr>
<tr>
<td>(i) No</td>
<td>◯ N</td>
<td>◯ N</td>
<td></td>
<td>✓ N</td>
</tr>
<tr>
<td>(ii) Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Y [Go to 167]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Y [Go to 179]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>165A. Did you (talk with) (consult) (visit) a doctor about this?</strong></td>
<td></td>
<td>165A.</td>
<td>172.</td>
<td>178.</td>
</tr>
<tr>
<td>(i) No</td>
<td>◯ N</td>
<td>◯ N</td>
<td></td>
<td>✓ N</td>
</tr>
<tr>
<td>(ii) Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Y [Go to 167]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Y [Go to 179]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>167. Within the same three months, did you take or use anything at all to relieve this?</strong></td>
<td></td>
<td>167.</td>
<td>173.</td>
<td>179.</td>
</tr>
<tr>
<td>(i) No</td>
<td>◯ N</td>
<td>◯ N</td>
<td></td>
<td>✓ N</td>
</tr>
<tr>
<td>(ii) Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Y [Go to 167]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Y [Go to 179]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>167A. Was this (Were these) prescribed or suggested by a doctor?</strong></td>
<td></td>
<td>167A.</td>
<td>174.</td>
<td>180.</td>
</tr>
<tr>
<td>(i) No, none prescribed</td>
<td>◯</td>
<td>◯</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>(ii) Yes, some prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Y, some prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Y, all prescribed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(v) Don't know,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>168. Within the same three months, how many days has this kept you in bed all or part of a day, including days you may have been in a hospital or (nursing home) (convalescent home)?</strong></td>
<td></td>
<td>168.</td>
<td>174.</td>
<td>180.</td>
</tr>
<tr>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
</tr>
<tr>
<td><strong>169. Within the same three months, how many days altogether has this kept you from doing the things you usually do?</strong></td>
<td></td>
<td>169.</td>
<td>175.</td>
<td>181.</td>
</tr>
<tr>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
<td>___________ days</td>
</tr>
<tr>
<td>[Return to 150]</td>
<td>[Return to 156]</td>
<td>[Return to 181]</td>
<td>[Go to Section J]</td>
<td></td>
</tr>
</tbody>
</table>
### WHO Health Care of the Elderly

**Now some questions about particular symptoms.**

* 35. In the last two weeks have you suffered from:
   (ask this question before each subquestion 1–24)

<table>
<thead>
<tr>
<th>Question</th>
<th>Occasionally?</th>
<th>Often?</th>
<th>Nearly continuously?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Headache?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Worsening of memory?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Lack of appetite?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Heartburn?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Stomach pains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Diarrhoea?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Nightmares?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Difficulties in falling asleep?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Lack of sexual desire?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Sense of giddiness?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Palpitation of the heart?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Tremor of hands?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Excessive sweating without physical effort?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Difficulties in breathing or shortness of breath, without physical effort?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Unwillingness to do things or lack of energy?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Tiredness or feeling of faintness?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Nervous tension, nervousness?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Irritability or bursts of anger?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Low spirits or depression?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Constipation?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Aching or pain in the joints?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Back trouble?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

* Reproduced from Ad hoc study on health care of the elderly: report of a Steering Group. Copenhagen, WHO Regional Office for Europe, 1978 (ICP/HSP 004(1), ICP/HSD 007(1)).

- 98 -
ANNEX 3

EXAMPLE OF LAYOUT FOR A SELF-ADMINISTERED QUESTIONNAIRE WHICH IS ALSO PRECODED:
RAND HIS EXCERPTE

75. Do you have to stay indoors most or all of the day because of your health?

Yes .................................. 1 - Answer 75-A
No ..................................... 2 - Go to 76

75-A How long have you had to stay indoors most or all of the day because of your health?

(Circle one)

Less than 1 month ........................ 1
1-3 months .............................. 2
More than 3 months ..................... 3

76. Are you in bed or a chair for most or all of the day because of your health?

Yes ................................ 1 - Answer 76-A
No ................................... 2 - Go to 77

76-A How long have you been in bed or a chair for most or all of the day because of your health?

(Circle one)

Less than 1 month ........................ 1
1-3 months .............................. 2
More than 3 months ..................... 3

77. Does your health limit the kind of vigorous activities you can do, such as running, lifting heavy objects or participating in strenuous sports?

Yes ................................ 1 - Answer 77-A
No ................................... 2 - Go to 78, next page

77-A How long has your health limited the kind of vigorous activities you can do?

Less than 1 month ........................ 1
1-3 months .............................. 2
More than 3 months ..................... 3

---

* Reproduced from the RAND HIS, green form; for conceptualization, see Brook, R.H. et al. Overview. In: Conceptualization and measurement of health for adults in the health insurance study. Santa Monica, CA, Rand Corporation, 1979, Vol. 8.