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Copenhagen



# Measuring Health

A STEP IN THE DEVELOPMENT OF CITY HEALTH  
PROFILES

*by*  
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## **TARGET 14**

### **SETTINGS FOR HEALTH PROMOTION**

*By the year 2000, all settings of social life and activity, such as the city, school, workplace, neighbourhood and home, should provide greater opportunities for promoting health.*

#### ***Keywords***

HEALTH SURVEYS  
URBAN HEALTH  
HEALTH STATUS INDICATORS  
QUALITY OF LIFE  
ENVIRONMENTAL HEALTH  
SOCIOECONOMIC FACTORS  
HEALTH BEHAVIOR  
EUROPE

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# Foreword

City Health Profiles are precious instruments for addressing and dealing with urban health issues in a comprehensive way. They provide the informed basis for priority-setting, strategic planning and accounting for health. The making of credible and clear profiles requires the employment of a wide range of skills and methods. This is a challenging task for city professionals who may not have always at their immediate disposal the resources and the knowledge to develop them. Furthermore there is today a wealth of experience from the international scientific community and many cities that could greatly benefit the hundreds of cities and towns that are involved in the healthy cities movement. The book at hand is a resource guide of standard and reliable tools for measuring factors affecting health. The main areas covered include: Health Status and Quality of Life, Health Behaviours, Health and Environment, Health and Socioeconomic circumstances. These are areas that are often underreported in conventional health reporting and yet essential for any serious effort to understand and address health and its determinants in the urban context.

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## 1

## Introduction

Public health, the improvement of a population's health through the organized means of society, has a long tradition. Public health has always depended on sufficient food, clean water and protection from disasters. Infectious diseases have been reduced through isolation, immunization and specific treatments; measures to combat chronic diseases have also been based on epidemiology. The World Health Organization health for all programme emphasizes the broad scope of public health at national level and Healthy Cities affirms the fundamental contribution of local organizations – municipal, professional and voluntary.

### **What is this document for?**

'City Health Profiles', published by the Healthy Cities Office of the World Health Organization in 1995, provides guidance on how Healthy Cities can assess the local health problems they face. Profiles can include a wide range of information, including population characteristics, health services data, environmental and social information.

This report provides further technical help in writing Health Profiles. It describes survey instruments and broader health measures for use in Health Profiles but it excludes routine health data, such as deaths, health services provision and activity, which are usually provided by national or local statistical departments.

Where possible, standard methods and instruments to measure health factors are given. References are provided to encourage users of the document to investigate the sources further. Attention has been paid both to the accuracy of the information obtained and to the reliability and validity of the methods used.

Some of the areas are treated in more detail than others and it is possible that there is contradictory information as different sources of informa-

tion have been sought. In some areas it has only been possible to point out some sources of data and give some examples of practice.

### **Positive Health**

The Ottawa Charter for Health Promotion adopted in 1986 provides the strategic framework to implement the health for all principles. It says: "Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Health promotion therefore, is not only the responsibility of the health sector, but goes beyond healthy life-styles to well-being". Positive health thus has three linked dimensions – social, psychological and physical – which should all be included when measuring health.

### **Healthy Cities**

The WHO's Healthy Cities Project was set up in 1986 to translate the health for all principles into practice at local level in urban settings and is now in its second phase. By the end of 1995 all participating cities should have committed themselves to producing City Health Profiles and City Health Plans within four years of joining the project.

*City Health Profiles* should be comprehensive reports which provide a description of the health of the city's population. City Health Profiles will use health indicators to define the population's health in individual cities and present information on the lifestyles, environmental and social factors in the city that affect health. They should be an element of objectivity useful in building awareness and discussion of important health issues. It should be possible to make use of them to monitor changes.

*City Health Plans* should address the problems affecting health in the city, develop policies and strategies to tackle these problems and indicate the ways that the city will promote health amongst all the citizens. Plans should have clearly defined, attainable goals covering a wide range of areas.

### **Using this report**

Each Healthy City will have available some expertise in survey methods and information handling – for example, staff in the municipal Public Health Department or a local University.

Surveys can be a valuable source of information for Health Profiles. They give local information and may record a range of concerns, including health status, health-related attitudes or experience of health care. But surveys are not the only means of collecting such data: other methods include meetings of selected groups of people (focus groups), repeat questionnaires developing consensus between participants (Delphi technique) and qualitative descriptions by observers (participative or non-participative methods).

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But a Health Profile has a purpose – it is ‘a document that is going somewhere’. This report is a guide to sources and materials and should be used to support local ideas and action.

## 2

# HEALTH AND LIFESTYLE SURVEYS

Health and lifestyle surveys generally focus on the social and behavioural factors that influence health. They may also be used to record health-related attitudes and experience of health services.

Surveys can be carried out in response to broad and/or local initiatives. Small and limited topic surveys are usually prompted by local concerns over particular issues. It is desirable that local surveys are linked at district level to corporate objectives aimed at prevention and health promotion within a national framework.

Regional/national bodies could play a coordinating role, provide expertise and advise on best practice. Sometimes district or regional surveys might pool the costs of several local surveys and avoid duplication of work.

### 2.1 UNDERTAKING A HEALTH AND LIFESTYLE SURVEY

A strategic plan must be made explicit before carrying out a survey. It should consider the following:

#### 2.1.1 Purpose

Three main objectives can be suggested for a health and lifestyle survey:

- i. baseline information for monitoring patterns of health and changes in health behaviour;
- ii. information for planning service provision, including the development and evaluation of the impact of health promotion and disease prevention programmes;

- 
- iii. raising awareness and improving the agenda setting for health promotion.

It is important to mention the reasons for the choice of survey subject matter and its relevance and priority. For example, the purpose may be to record health status (height, obesity, blood pressure), health-related behaviour (smoking, exercise), health care use (attendance at clinics) or attitudes to health (reasons for health choices).

A health and lifestyle survey can describe the prevalence of a particular factor which may contribute to future health or illness and generate possibilities for intervention. Repeated measurement of the same factors can allow monitoring of the effectiveness of population interventions.

### **2.1.2 Population**

The meaning of “health” changes for different sections of the population – by age, sex, ethnic sub-group – and it may be appropriate to survey only part of a geographical area. A section of the population may be chosen for local reasons – for example, the health of children if that is of particular concern. The results of general population surveys can be broken down into separate groups if the sample size is large enough, but larger sample sizes have higher costs.

### **2.1.3 Who should carry out the survey?**

Managing a population survey is a learned skill. For reliability, an experienced organization may be employed to do the survey, such as a local university department or commercial social survey agency. However, local surveys can also be done by the population themselves and may have the advantage that such participation creates greater commitment to using the results. Health Promotion Units may be in a good position to carry out surveys, particularly as they might be involved later in action arising from the survey.

### **2.1.4 Methods**

Attention should be paid to the survey methods, such as data collection and sample design, because of their effects on data quality.

*Sampling frames:* Population registers frequently include address and postal files, telephone directories and electoral registers. It is desirable also to explore ways of reaching some groups which are excluded such as non-respondents, people in institutions and homeless people.

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*Sample size and structure:* The sample should be representative of the population and large enough to provide sufficient data for statistically reliable conclusions to be drawn.

*Comparability:* Surveys may differ in their methods to such an extent that the results are not comparable with other surveys. Where possible, data should be collected using standard questions and measures. International classifications such as ISCO (the International Standard Classification of Occupations), ICD (the International Classification of Diseases) and ICIDH (the International Classification of Impairments, Disabilities and Handicaps) should be used when appropriate.

A survey can be carried out through:

- postal interviews (self-administered questionnaires);
- face to face interviews (the method most commonly used);
- telephone interviews: these can be useful for supplementing and/or validating information but not for obtaining representative samples in countries where telephones are not readily available to all households;
- rapid assessment: this implies surveying a few contacts within the community who have knowledge of the problem and trends within that community. The method is cheap and quick but will not be truly representative;
- information collected by General Practitioners (e.g. smoking and drinking information). This is a cheap and effective way of collecting lifestyle information, but not all General Practitioners will necessarily collaborate.

*Pilot:* it is always necessary to test the questionnaire, methodology and analysis of a survey on a small sample before undertaking the main survey. The pilot assists in anticipating problems, for example, if the questionnaire is too long, the respondents not easy to contact, the results difficult to analyse and allows alternative choices to be made.

### **2.1.5 Survey analysis**

Surveys are recorded as numerical (quantitative) data and possibly also with written (qualitative) information. Statistical analysis should use a simple computer database. These are readily available and make the analysis much easier than doing it by hand.

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### 2.1.6 Communication of the results

It is important to make the best use of surveys when they are done: that includes paying attention to the communication of the information gathered.

Health status measurement results should be presented in an understandable manner. In particular, scores and score changes must be accompanied by some interpretation. It may be useful to supplement the basic findings that are for wide distribution with a longer technical report for more limited circulation.

### 2.1.7 Costs and benefits

Survey work is expensive. The components of the costs include:

- costs of developing the survey
- costs of carrying out the survey
- costs of analysing and promulgating the results.

The costs of large surveys vary according to the method with data-collection costing substantially more than postal surveys. To minimize costs it is essential to adopt a pragmatic approach and make as much use as possible of accredited survey material.

Surveys will only give value for money if they are linked to a programme of action.

### 2.1.8 Satisfaction

It is useful to send an inset sheet within the report to ask readers what they think of the survey and results. This can be valuable when developing a repeat survey.

### 2.1.9 Other considerations

- 1) *Ethical issues*: ethical approval may not be needed if the survey is only a questionnaire. However, the survey interviewer should emphasize to respondents that they have the right to decline to give information and the survey staff must ensure confidentiality of individual replies.
- 2) *Equipment*: consider selection, purchase and movement of equipment if biological measurements are included (blood pressure, urine analysis, etc.).
- 3) *Involvement of health professionals*: this requires a balance between informed help and ensuring that the survey retains a public health perspective.

- 4) *Detailed measurement protocol*: this is to ensure sample quality and (for blood-taking particularly) acceptability to the public.

For more detail on this section, refer to the valuable books by Abramson (1) and Oppenheim (2).

## **2.2 AN OVERVIEW OF HEALTH AND LIFESTYLE SURVEYS IN EUROPE**

In 1990 a study was carried out by Evers (3) to collect information on the coverage of the health for all indicators in health interview surveys in European countries. There were 58 responses from 26 countries (20 European countries, Australia, Japan, Israel, Morocco, the USA and Canada). Those included:

- 21 health interview surveys (Australia, Canada, Denmark, Finland, France, Hungary, Italy, Japan, the Netherlands, Norway, Portugal, Poland, Spain, Switzerland and the USA);
- 11 multi-purpose surveys;
- 7 disability surveys; and
- 7 standard of living surveys.

Questionnaires were also completed for a number of special surveys (e.g. nutrition and drinking and driving surveys).

There is a great variation in the number of indicators measured by different countries. There is a lack of uniformity both in the phrasing of the questions and in the standards and methods used, so that information is only rarely comparable.

## **2.3 SOME EXAMPLES OF HEALTH AND LIFESTYLE SURVEYS**

Many districts and health regions in the United Kingdom have undertaken local health surveys. The Trent Health Lifestyle Survey is a regional survey in Britain (4). Questions about diet, exercise, smoking, alcohol consumption, stress, social support and beliefs about health are included in the study. Two populations were sampled: the whole adult population aged between 16 and 70 taken from the local National Health Service Register and secondary schoolchildren aged between 11 and 15 taken from school lists and registers.

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Districts were given options of increased sample size in one sub-area (locality) and of extra questions of their own choice to allow region/district/locality comparisons.

The questionnaire was self-administered for adults and administered by teachers to schoolchildren. There was a standardized printed report of basic tables to Health Authorities and Local Authorities and raw data was also given to Health Authorities to do in-house analyses.

The Office of Population Censuses and Surveys Health Survey for England (5) is a national population survey. The size of the sample (17 000) is not large enough to be representative at a district or ward level. However, estimates of district and ward health and lifestyle indicators can be made by a statistical process ("synthetic estimation"). National health behaviour surveys have also been carried out in several other European countries.

# 3

## HEALTH MEASUREMENT INSTRUMENTS: METHODS AND CHOICES

More detail on the scales and measures described in this chapter will be found in McDowell & Newell (6) and Bowling (7).

### 3.1 METHODOLOGICAL CRITERIA

For instruments designed for discriminative (showing cross-sectional differences between people) or predictive (predicting a concurrent or future gold standard) purposes, demonstration of validity and reliability is necessary and sufficient to ensure usefulness. However, for evaluative instruments (those designed to measure longitudinal change over time) another property is required: the instrument must detect clinically important changes over time, even if those changes are small. This has been referred to as sensitivity to change or responsiveness.

*Validity and reliability* are perhaps the most important criteria that should be used in the development and application of health measurement instruments.

Validity is concerned with whether the indicator actually does measure the underlying attribute or not. The assessment of validity involves assessment against a standard criterion.

Reliability (consistency or reproducibility) is a measure of the proportion of the variability in scores which is due to true differences between individuals. A measure is judged to be reliable when it is relatively free of measurement error and thus consistently produces the same results, particularly when applied to the same subjects at different time periods.

Other methodological criteria are:

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- generalizability
  - sensibility
  - relevance
  - practicality.

It is important to assess beforehand the costs of data collection and analysis as well as the respondent burden.

A reproducible and responsive instrument is clearly measuring something, but it may not be as readily evident what that something is. Thus an instrument may be valid for one purpose, but not for another. It is therefore important to choose the measure most appropriate to the objectives of the study.

### **3.2 SCALING**

Most of the health indices record responses in descriptive forms. Scaling methods exist for translating these statements into numerical estimates of severity and once this is done they may be combined into an overall score, known as a “health index”. Scaling enables us to make comparisons between health states both for individuals and for groups.

When using a health measurement instrument attention should be paid to the type of scoring that the instrument is based on as the selection of a scaling technique has important implications for the valuations of health states, differences in results being obtained using different techniques.

To be useful, scaling methods must be both economical and acceptable to respondents. The response rate could be an indication of the method’s acceptability although it is influenced by other variables as well (e.g. population group).

#### **Self-report measures**

- Single-item measures – adequacy difficult to assess.
- Battery – responses are not summed or weighted.
- Scale – all categories of responses are in the same format, are summed, may be weighted and are suitable for statistical calculations.

**Numerical measurement scales** can be of four types:

- i. Nominal scales
- ii. Ordinal scales

- iii. Interval scales
- iv. Ratio scales.

There are many methods that, by scaling, put a set of items in a hierarchy of severity. As an example in the Guttman's scaling of disability, the degrees of patients' disability are ranked in respect of a number of activities, such as feeding, continence, ambulation, dressing and bathing. This method assumes that disability can be ordered. Provided that disability progressed steadily from one activity to another, this method of scaling yields a single rating from 1 (no disability) to 6 (disabled on all five). Guttman's scaling has been criticized for attributing equal weight to each item and not being comprehensive in terms of describing the activities of daily living. It has two different scales: one for men and one for women. The Index of Activities of Daily Living is an example of a measure using this scaling method.

**Weighting** scale items allows us to take into consideration that some items may be more important to the construct underlying the scale than others and should therefore contribute more to the total score.

### **3.3 HEALTH STATUS AND QUALITY OF LIFE MEASURES**

It is important to be cautious when deciding on which measure to use as one measure developed for one specific purpose and administered and validated on one specific sample could be inappropriate for use with other purpose or for another type of population.

#### **3.3.1 Functional assessment measures**

Most measures of functional status are self-report (subjective) measures. Subjective measures are frequently used because they are socially important. Functional assessment is also one of the most common methods of assessing the outcome of care.

#### **3.3.2 Global measures**

These are measures which attempt to capture the nature of health status and, indeed, the whole range of physical, mental and social functioning.

##### *a) Aggregate measures*

Health status is captured in a single number or score. An example is the Rosser matrix which has been used, particularly in Britain, in the derivation of QALYs (Quality-Adjusted Life Years).

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### *b) Profiles*

Individuals are profiled in a series of dimensions. A key feature of the profile approach is to capture health status in a comprehensive manner. Typical dimensions are found in the Nottingham Health Profile.

Although global measures provide inadequately detailed information when used in conjunction with disease-specific measures, they can provide a fuller picture of the impact of ill health on particular patient groups. The use of global measures of health status has been advocated as a potential method for providing data on perceived need in the community. The advantage of global health measures is that population norms can be derived to provide baseline data.

#### **3.3.3 Disease-specific measures**

Those specific measures are important for clinical decision-making. They are designed to assess specific diagnostic groups or patient populations, often with the goal of measuring responsiveness or “clinically important” changes.

Disease-specific measures are available for arthritis (e.g. Arthritis Impact Measurement Scale), back pain, cancer, chronic lung disease, diabetes, digestive diseases, cardiovascular diseases and multiple sclerosis.

#### **3.3.4 Utility measures**

Utility measures are used when the outcomes cannot be measured in natural units, so a utility or value scale has to be employed. This may be because the important outcomes are not directly comparable or that they are multifaceted.

The most commonly used utility measure is QALYs (Quality-Adjusted Life Years), which uses survey tools such as the Nottingham Health Profile or Rosser’s Classification of States of Ill Health to allocate “relative qualities” to different health states. QALYs are a quantitative measure of health status which provides a common denominator with respect to which the consequences of different interventions may be compared.

Health status and quality of life measures found to be suitable in one culture and which are being considered for use in another must be submitted to rigorous examination for conceptual, semantic and linguistic equivalence. Careless translation could have unknown and probably profound effects upon the validity and reliability of the information obtained. The major issue is one of comparability of meanings when the items are presented to people who differ in everyday vocabulary and grammar. Language changes alone do not satisfy the requirements for cross-cultural adaptations. Despite the problems of adapting health measures to other cultures it is important to

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consider the reasons for translation, rather than developing a new instrument specific to the other culture. Those reasons could include:

- the demonstrated value of the existing instrument;
- the length of time it would take to develop a new one;
- the ability to perform comparison studies (for example, the influence of culture on the experience of disability and discomfort);
- the possibility to explore and explain cross-cultural diversity; and
- the impact of different health systems on health states.

# 4

## HEALTH STATUS AND QUALITY OF LIFE MEASURES

### 4.1 FUNCTIONAL DISABILITY AND HANDICAP MEASURES

Most measures of functional disability use self-report methods.

When trying to measure function, there are three different considerations:

- i. an impairment refers to a reduction in physical or mental capacities;
- ii. a disability might result when the effects of an impairment are not corrected and it implies a restriction on a person's ability to perform a function considered normal for a human being;
- iii. a handicap refers to the social disadvantage (e.g. loss of earnings) that might derive from disability.

Environmental factors, the availability of social support and the patient's determination all influence how far an impairment will be translated into a disability or handicap. Different patients may react differently to apparently similar levels of physical impairment, depending on their previous history, their expectations, priorities, goals, social support networks and so on.

Different scales have been developed to assess the individual's ability to perform Activities of Daily Living (ADL):

- basic ADL (bathing, dressing, toileting, transfer, continence, feeding);
- instrumental ADL (shopping, cooking, housekeeping, laundry, use of transport, managing money, etc.);

- 
- mobility.

The ADL scales are concerned with basic ADL and severe levels of disability, relevant mainly to patients living in institutions and elderly people, while IADL (Instrumental Activities of Daily Living) scales have been developed to consider problems more typically experienced by those living in the community.

In ADL scales the definition of disability seems usually to be taken for granted rather than clearly stated. The content of the IADL scales stresses the patient's functioning within his/her particular environment, more closely reflecting handicap than impairment or disability.

Assessments of patients' satisfaction and choice with regard to level of functioning are seldom made.

### **IADL scales**

IADL scales are generally used with less severely disabled or handicapped populations than IDL scales, often as survey instruments for use in the general population. The first two scales are used in clinical settings.

1. *The Quality of Well-being Scale (Index of Well-being or Functional Status Index)*

This is a time-specific measure of functioning that has been developed firstly to measure changes in population health status and secondly as an outcome measure in health services evaluation. It does not measure well-being at all but focuses on deviations from normal functioning. The scale combines mortality with estimates of the quality of life. It can be used with general populations and applied to any type of disease. It is a valid and reliable scale and is able to discriminate between changes in quality of life over time. Its main disadvantages are its complexity and the fact that it has to be administered by trained interviewers.

2. *The Functional Activities Questionnaire*

This was designed to assess independence in daily activities in community studies of normal aging and mild senile dementia. The scale levels are primarily defined in terms of social function rather than physical capacities. The validity of results is good.

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3. *The OECD (Organisation for Economic Co-operation and Development) Long-term Disability Questionnaire, 1981*

This is a survey designated to summarize the impact of ill health on essential daily activities. It was intended to provide international comparisons of disability and to monitor changes in disability at a national level over time. Participating countries included Canada, Finland, France, the former West Germany, the Netherlands, Switzerland, the UK and the US. The validity and reliability of the questionnaire are poor and some weaknesses have been reported.

4. *The Lambeth Disability Screening Questionnaire, 1981*

This is a postal questionnaire designed to screen for physical disability in adults living in the community. The second version of the questionnaire is one of the very few validated postal screening instruments available. One person of the family records details about all the family members or adults living in the household. The third version is interviewer-administered and collects data on the respondent only. Despite the fact that it is a good questionnaire it should be more fully tested before being recommended for widespread use.

5. *The Activities and Skills Profile (ASP7), University of Amsterdam*

This is a self-report questionnaire which measures functional status and the use of the individual's skills in ADL, housekeeping and at work.

6. *Linn's Rapid Disability Rating Scale, 1967, revised 1982*

This was developed for summarizing the functional capacity and mental status of elderly chronic patients. It may be used with hospitalized patients and with people living in the community. It has been used in several evaluative studies. It is a broad-ranging scale that comprises 18 activities, broader in scope than most ADL scales. A great deal of attention has been paid to validity and reliability, but there have been criticisms of the scoring system.

## **4.2 PSYCHOLOGICAL WELL-BEING (PWB) SCALES**

These measures cover short-term psychological states rather than lasting traits and describe human psychological responses in adapting to the environment. One of the major problems of these scales (as of those of life satisfaction and quality of life) is the difficulty of establishing firm conceptual definitions and thus comparisons between studies.

Two approaches have been used in constructing those scales:

- checklists of somatic and behavioural symptoms of distress
- questions about positive and negative feelings of well-being.

However, considerable attention has been paid to testing the validity and reliability of these methods and the results are good.

Examples of psychological well-being that can be used in population surveys are:

1. *The Health Opinion Survey, Macmillan, 1957*
2. *Langner's Scale, 1962: The 22 Item Screening Score of Psychiatric Symptoms*

These (1 and 2) are the first generation of PWB scales. Both are brief scales that use the symptom checklist approach. They do not cover positive well-being and would not be recommended as they lack a conceptual basis that explains what they measure and how the results should be interpreted.

### 3. *The Bradburn's Scale*

This is a ten-item self-administered scale which covers positive and negative emotional reactions to the stresses of daily living. It was designed to indicate the psychological reactions of people in the general population to events in their daily lives. It has been widely and consistently used in many large surveys. There are several important strengths in Bradburn's scale. It has acceptable levels of validity and reliability and it has been reported to be sensitive to change. However, detailed criticisms have been made and as it is an old scale, applying more recent alternatives should be considered.

### 4. *The General Well-being Schedule.*

This self-administered questionnaire covers measures of anxiety, depression, positive well-being, self-control, vitality and general health. The most well known application is the modified version incorporated into the Rand Mental Health Inventory. The available validity and reliability tests show extremely good results. It should be considered for use where a general population indicator of subjective well-being is required.

### 5. *The Mental Health Inventory.*

It considers the following dimensions: anxiety, depression, behavioural/emotional control, general positive affect and emotional ties. It has been used to predict the use of services. It could be considered as a good alternative to the General Well-being Schedule and could be recommended as a case-detection instrument.

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The following two scales are longer scales and cover both positive and negative feelings and are intended for use in population surveys.

### *6. The General Health Questionnaire.*

This is a self-administered questionnaire explicitly designed to detect acute, non-psychotic mental health disorders in population studies. It is not suitable for detecting chronic problems. It was intended for use in general practice settings. Numerous surveys indicate that the GHQ is suitable for use with younger and older people in community and primary care settings. It is most useful as part of a medical consultation and has seen a widespread use in General Practice for screening for mental disorders. It offers a leading example of how a health measurement method should be developed. The validation studies have been thorough and extensive and the questionnaire shows a high degree of validity. It has been tested in numerous countries showing remarkably consistent validity results. The GHQ appears to be a reliable instrument.

The major problem with the GHQ is that its scoring system rests on an unjustified assumption that the items are equally weighted and this invalidates the quantitative manipulation of responses. The GHQ is the most widely applied measure of psychiatric disturbance in the UK and also has numerous worldwide applications. It has been adapted for use outside the UK and has been translated into at least 38 languages. There are four versions of the GHQ with 12, 20, 30 and 60-item versions being the GHQ-30 the most widely used.

### *7. The Geriatric Mental State*

This was developed in the UK for use with the elderly in community settings and was used within a broader semi-structured interview schedule, the Comprehensive Assessment and Referral Evaluation (CARE). Interviewer training is required for the GMS and the CARE. It has been adapted for use outside the UK and has been used in a number of studies. The GMS is a well-validated and tested scale. It is reliable and sensitive to change over time but it is extremely lengthy (there is a shorter community version available: GMSA). The full length GMS is frequently used as a gold standard against which to assess other scales of mental state.

It has been translated into French, Spanish, German, Danish, Dutch and Icelandic.

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### 4.3 SOCIAL HEALTH MEASURES

An individual's social health concerns such dimensions as how he/she gets along with other people and how other people react to him/her as well as how he/she interacts with social institutions.

The concept of the Person-Environment Fit: the socially healthy person would be one who has found a comfortable niche in which to operate to the best of his capacities and to the satisfaction of those around him.

There are practical reasons for measuring the social adjustment and social support of an individual as there is a trend towards caring for people in the community. Social adjustment could be measured by assessing a person's satisfaction with his relationships or by assessing his performance of various social roles.

In assessing social support emphasis is on the quality of relationships rather than their number or type. Social networks could be seen as the structure through which social support is provided. The majority of scales measuring social health assess social adjustment. Most of the measures have not been fully tested for validity and reliability and there is a lack of agreement on conceptual basis.

#### 1. *McFarlane Scale*

This was developed to assess the extent of an individual's network of relationships and its perceived usefulness in reducing the effects of life stresses on health (social support). It was intended as a research self-administered (interviewer assisted) instrument. It has been used in few studies and further validity and reliability tests on larger samples and in other centres are necessary.

#### 2. *The Sarason's Questionnaire*

This was intended as a research self-administered instrument to assess the availability of and satisfaction with social support. It has been used in several studies and it appears to be one of the best social support scales. However as it is new further evidence of validity and reliability is required.

#### 3. *Henderson's Interview Schedule*

This is a rather long research questionnaire, interviewer-administered, designed as a survey method to measure social factors associated with the development of neurotic illness. It could also be used to evaluate outcomes of psychiatric patients' care. It is one of the few scales that measures social support rather than social roles. It has been used in few studies. Evidence for validity and reliability are quite good.

#### *4. The Social Functioning Schedule*

This is a semi-structured interview designed to assess social adjustment but it does not cover positive levels of functioning. It was designed for evaluating treatment of neurotic outpatients. There could be an interviewer bias as the rating system depends on the judgement of the interviewer. It has been used in few studies and preliminary validity and reliability analyses are available.

#### *5. Gurland's Interview*

This provides a detailed clinical assessment of social role performance (social adjustment measure) as an outcome indicator for psychotherapy. It has been used in several clinical and research studies and is one of the more widely used of the social health measures. More evidence is needed for the validity of the instrument.

#### *6. Weissman's Scale*

This was designed as an outcome measure of drug treatment and psychotherapy for depressed patients. It has also been used with a broader range of patients and healthy people. It has been used extensively in psychiatric research. Although it has some limitations, it is the most carefully developed among the scales measuring social adjustment and shows the highest levels of validity and reliability.

#### *7. Interpersonal Support Evaluation List*

This aims to measure the perceived availability of support which could help in coping with stress. Although further testing of the scale is required, the validity and reliability results are fairly good. The scale may not be suitable for use with frail elderly people.

There are many other scales to measure social health but generally there is a lack of evidence for their validity and reliability and the instruments have seen little use. The Norbeck Social Support Questionnaire is a promising social support scale.

### **4.4 SOCIAL NETWORKS**

Social networks, the structure through which social support is provided, constitute a resource available to the individual to enhance his/her quality of life. Networks influence sickness and health. The more and the stronger social relations an individual has and the more supportive they are, the less

risk he has of becoming ill and the more chance of recovering from illness. Furthermore, mortality is higher for people who have no supporting networks.

Networks influence vulnerability, the ability to cope with strain and the effects of strain and the individual's health behaviour. The following questions were used in the survey questionnaire conducted with the purpose of making a profile of people's health in Copenhagen (8):

- Can you expect help during illness?
- Are you ever involuntarily alone?

Then the characterization of those with weak networks is based on various questions concerning age, sex and marital status, perceived health and well-being, health habits, behaviour during illness, housing/environment and leisure.

Networks also constitute an important basis for the application of health promotion programmes. Creating and supporting networks should thus be considered an area for development with the aim of promoting people's health. It would be useful to have a map of local network activities to give a comprehensive view of the numbers and weight of the current activities aimed at social networks as well as of those organized on a voluntary basis.

#### **4.5 QUALITY OF LIFE AND LIFE SATISFACTION MEASURES**

Quality of life relates to the adequacy of material circumstances as well as to people's feelings about these circumstances. It recognizes that individual responses to the physical, mental and social effects of illness on daily living influence the extent to which personal satisfaction with life circumstances can be achieved and that health is generally acknowledged as being one of the most important determinants of overall quality of life.

Dimensions of quality of life include physical and sexual activity, social and leisure activity, work, loss of income, cognition, self-esteem, interpersonal relationships, emotional adaptation, anxiety, stress, symptoms and overall satisfaction with life.

Life satisfaction generally refers to a personal assessment of one's condition, compared to a reference standard, or to one's aspirations. Many of the measures of quality of life in relation to health status are relatively new and thus underdeveloped (most of them are psychometrically weak) and under-tested. The validity and reliability of those measures are still questionable.

### *1. Four single item indicators of well-being*

- Delighted-Terrible Scale
- Faces Scale
- Ladder Scale
- Circles Scale.

This is a set of single item self-administered scales which could be used to assess satisfaction with life in general, or with more specific topics such as health, economic status or housing. The scales are simple to apply. The non-verbal format is an advantage and allows them to be used with children and others who would have difficulty completing a questionnaire. They have been commonly used in population surveys but can also be used in clinical settings. However, more evidence on the validity and reliability of these scales is needed.

### *2. The Life Satisfaction Index*

This self-administered scale covers general feelings of well-being among older people. It has been extensively used as a survey method and has several strengths, including reliability, strong correlation with other scales and the availability of reference standards. It shows consistent validity results. Despite conceptual uncertainties, its psychometric properties are among the best of comparable indices.

### *3. Lawton's Scale*

This was designed to measure dimensions of emotional adjustment in persons aged 70 to 90 and is applicable to community populations as well as to people in institutions. It is easy to administer and can be self or interviewer-administered. It has had numerous applications. It appears to be a reliable scale and, while more data are needed on the validity of the scale, it is believed to be the best of the existing life satisfaction and morale scales.

## **4.6 GENERAL HEALTH MEASURES**

Generally those measures have been designed with research applications in mind. In general they have been thoroughly tested for validity and reliability and often are methods of good quality.

Some, such as the Sickness Impact Profile, are flexible in their design and enable the user to select only required components while others, such as

the Multidimensional Functional Activities Questionnaire, are intended to be used in their entirety.

### *1. The Arthritis Impact Measurement Scale (AIMS)*

This is a self-administered questionnaire covering physical, social and emotional well-being, intended as an indicator of the outcome of care for arthritic patients. It may be applied to a range of conditions but it is only suitable for use with chronically ill patients. It is suitable for use in the community, well tested for validity and reliability and is sensitive to change.

### *2. The Nottingham Health Profile (NHP)*

The NHP is a self-administered questionnaire designed to measure perceived health problems (Part I) and the extent to which such problems affect daily activities (Part II), but it is best to regard it as a measure of distress in the physical, emotional and social domains. It assesses demand for care in population health surveys and has also been used in clinical studies.

Unlike other generic measures of health status, the items used in the NHP were generated from hundreds of interviews with lay people. The questionnaire has two parts, I and II, with Part II being optional (it can be omitted without affecting the overall validity and reliability of the instrument). It is a relatively short profile with just 45 yes/no answers required from respondents. It covers the following dimensions: physical mobility, pain, sleep, energy, social isolation, emotional reactions and employment, social life, household work, home life, sex life, interests and hobbies and holidays (9). It does not attempt to be a comprehensive measure of health-related quality of life and is too short to assess the impact of a condition on quality of life.

The NHP has been used in a variety of medical and non-medical settings. It is suitable for use with a wide range of people. The strengths of the method include its simplicity, its sensitivity and its broad coverage. It has high validity and reliability and it has been shown to be sensitive to change. As a limitation of the profile it is important to remember that the items on Part I represent rather severe experiences and therefore healthy populations or those in milder distress will have low scores. The profile also covers only negative aspects of health.

The NHP is the only measure of perceived health which has been extensively tested and developed for use in Europe. It has been translated into Spanish, Catalan, French, Italian, Dutch, German, Danish, Swedish and Finnish. These foreign language versions of the NHP do not exactly mirror the English version as their language has been embedded in culture

and usage. It is the only instrument which has achieved conceptual rather than linguistic equivalences in these languages.

### *3. The Sickness Impact Profile (SIP)*

The SIP was developed as a measure of perceived health status for use in measuring the outcomes of care, in health surveys, in programme planning and policy making and in monitoring patients progress. It was designed to be broadly applicable across a wide range of health problems and diseases and across demographic and cultural subgroups. Sickness is measured in relation to its impact on behaviour. It may be self or interviewer-administered and has been developed with exemplary care and thoroughness from interviews with lay people. There have been many applications of the SIP to a wide range of patient groups and thus scores for many population groups are available for comparison. It has strong validity and reliability properties and is sensitive as an outcome measure in health services evaluation in general; however, its length is a disadvantage. For this reason a short version has been developed (SIP 68) which still needs to be studied further.

As translations exist into several European languages (English, German, French, Swedish, Danish, Dutch) it offers good opportunities for use in international surveys. It has been adapted for use in the UK as the Functional Limitations Profile. This scale is likely to become a standard against which to judge other methods.

### *4. The Lawton's Instrument*

### *5. The OARS Questionnaire*

### *6. The CARE*

The last three are extensive scales designated to provide comprehensive appraisals of the well-being of elderly people living in the community. They require lengthy interviews (a shorter version of the OARS Questionnaire known as the Functional Assessment Inventory is available) but provide results that seem to show good validity and reliability.

### *7. The Rand Corporation's Health Insurance Study Batteries*

The Rand Corporation's batteries were developed for use in population surveys as outcome measures to guide policy making in health care. The batteries cover physical, psychological, mental and social health as well as general health perceptions. Each section can be used independently by means of self-administered questionnaires.

Most of their applications are confined to the Rand's studies in the USA. Reliability and substantial evidence on the construct validity of the Rand's batteries have been reported, but the batteries may be of limited sensitivity for detecting changes in health status.

### *8. The SF-36*

The SF-36 was developed from the Rand Corporation's Health Insurance Study in the USA. It was designed as a generic measure for the evaluation of outcomes in medical care. It is intended to supplement existing medical measures.

It was developed from an original lengthy battery of questions and contains 36 items covering 9 dimensions (physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, energy/vitality, pain, general health perception and health changes over the past year).

The SF-36 appears to be acceptable to patients and a large number of publications have outlined the psychometric properties of the instrument. However Brazier et al. reported a higher number of missing values in the SF-36 among people over 65. Further research is required to determine the suitability of the questionnaire to the elderly. Ware (10) has reported that changes in SF-36 scores in one group over time can usually be measured with greater precision than differences between two groups.

In Britain, population norms have been provided for the SF-36 from a large scale community sample. Norms allow individual scores and group averages to be interpreted according to where they lie in the distribution of scores of a general population. Separate norms can be calculated for age, sex, occupation and social class. It has been suggested that when normative data sets exist these can be used for comparison with other populations and samples.

The original American version has been adapted for use in Britain and it has been suggested that other English speaking countries such as Australia and Canada may be able to use it with minimal changes. Authorized translations of the SF-36 are currently being developed by an international team of investigators.

### *9. The EuroQol Instrument*

This is a generic measure of health-related quality of life developed by a multidisciplinary group of European researchers. It has been used in a variety of studies of patient outcome in many European countries. It has also been used in a number of surveys to assess the health status of a general

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population which is described in terms of physical, social and psychological functioning and highlights factors that influence health state valuations.

# 5

## HEALTH BEHAVIOURS

Several aspects of personal behaviour are known, through epidemiological studies, to influence health status and form the focus of health promotion.

### 5.1 DIET

Diseases of affluence such as obesity, coronary heart disease, cancer and dental caries now affect a large proportion of the population in many Western countries. Whilst these diseases are multifactorial in origin, diet is recognized as an important factor in their development.

As diet has cumulative effects on health, periodic dietary assessments throughout adult life would be desirable. However, if no earlier data are available, the diet history method can be used to assess the usual food and nutrient intakes over an extended period of time (at least one year) in large population studies. Yet from a practical point of view the use of this method is limited since it is time-consuming and the costs are very high.

The current diet can be assessed by the 24-hours recall method or by food records. However both methods fail to characterize the diet during a longer period.

The diet history questionnaire should include those items that are representative of the population's usual diets. Therefore the eating patterns of the population should be taken into account before developing a new questionnaire or selecting an existing instrument designed for another group. Qualitative as well as quantitative information should be provided and the instrument should be objective.

Simplified diet history questionnaires have been developed for assessing the total diet of an individual. They can be self-administered and usually include the subject's estimated intakes of selected nutrients or sufficient foods as well as the frequency of consumption over a long period of time. Those short-cut questionnaires are sufficiently simple to be used in large-scale epidemiological studies and the cost is much lower. Among those, the

self-administered semi-quantitative food frequency questionnaire has attracted particular attention (11).

The choices of food we make can contribute to our health. However, many factors influence food choice including individual or group preferences, its cost and how easy it is to obtain. Healthier food is not always available in local shops. Surveys which intend to assess the availability as well as the relative cost of healthier food locally could provide useful information and complementary data to that obtained from dietary surveys.

**Dietary and nutrition surveys** will include detailed weighted records of food consumption, a questionnaire, anthropometric measurements (height and weight) and blood and urine tests.

In Great Britain, the National Food Survey (12,13) is a continuous sample inquiry into the domestic food consumption and expenditure of private households. By regularly changing the households surveyed, information is obtained continuously throughout the year. The whole age range of the population will be covered roughly every decade. The person principally responsible for domestic arrangements is asked to answer a questionnaire on the characteristics of the household and its members and to keep a record for a week of all the food intended for human consumption entering the house each day. Respondents are asked to record a description of each food item together with the quantity obtained and its cost. Data on the number of meals eaten outside the home is also collected. The energy value and nutrient content of the food obtained are evaluated using special tables of food composition.

A study on Nutrition and the Elderly in Europe (Euronut SENECA (14)) was designed to examine the relationship between diverse food cultures with health and performance of elderly people in Europe.

## 5.2 ALCOHOL CONSUMPTION

Surveys should measure the quantity of alcohol consumption during a “typical” or “average” period of time. See the Appendix for illustrative questions that can be used to assess alcohol consumption by means of a health interview survey. Those questions allow a distinction between abstainers and drinkers and permit measures of frequency and amount of drinking and therefore the quantity of drinks consumed per unit of time to be calculated. Drinkers can be classified using the total amount of alcohol consumed and occasionally heavy drinkers can also be identified.

An internationally comparable estimate of alcohol consumption (grams of ethanol/week) can be calculated if the amount of alcohol con-

tained in each culturally specific drink is known. However it is difficult to obtain a completely accurate measure of total alcohol consumed.

There are many problems in estimating alcohol consumption. For example studies have suggested that the General Household Survey (GHS) carried out in Great Britain and other surveys substantially underestimate consumption (compared with data on the quantity of alcohol on which duty is paid). Heavy drinkers are likely to be underrepresented both because they may not live in private households (homeless) or, if they do, may be unobtainable for interview or unwilling to cooperate. Those who cooperate may be unable to remember their drinking accurately or unwilling to reveal its full extent (that appears to be particularly true for alcoholic women). Therefore it is recommended that, where possible, questions should be self-completed and methods of estimating the extent of underreporting and correcting for it should be further developed.

Although it is recommended that health interview surveys focus on the quantity of alcohol consumed, there are other important aspects of alcohol consumption – such as physical dependence, behavioural problems, temporal patterns and the physical and social settings in which consumption occurs that should also be measured.

Additional information could be obtained from Police records in respect with alcohol-related accidents and abuse episodes. Some data could be obtained on work absenteeism due to alcohol-related illness as well as from hospital emergency departments regarding alcohol-related admissions.

Complementary information can be obtained from mortality rates due to alcohol-related causes (e.g. cirrhosis of the liver).

### **5.3 SMOKING**

See the Appendix for illustrative questions that can be used to assess tobacco consumption by means of a health interview survey. The reliability of smoking questions is improved if supported by measures of cotinine (metabolite of nicotine) from saliva samples. Indirect measures can be obtained by looking at hospital admissions for smoking-related diseases (e.g. bronchitis and lung cancer) and information from suppliers and retailers on tobacco sales.

### **5.4 DRUGS**

Data on intravenous drug users (IDU) can be obtained from different sources such as fieldwork among drug users, agencies having contact with drug users (community projects, residential rehabilitation centres and hos-

pitals), official notifications, HIV-test reporting schemes, police records and death certificates (drugs-related deaths).

It is widely recognized that official notifications underrepresent the total drug-using population. Using available data, different statistical methods can be applied to estimate the prevalence of drug misuse. Recently, 'capture-recapture' methods, which draw from overlapping samples, have been used and are thought to provide a more accurate estimate of the true prevalence.

## 5.5 SEXUAL LIFESTYLES

The AIDS epidemic has highlighted the lack of sound information on sexual lifestyles based on survey methods and random samples and the need for research into that field. In Britain, the 1990 National Survey of Sexual Attitudes and Lifestyles surveyed 19 000 men and women aged 16–59 (15). Two of the main purposes of the survey were to provide data that would help to understand the transmission patterns of HIV and other STDs and the selection of appropriate and effective health education strategies for epidemic control. Similar surveys are now being conducted in several European countries, including Norway, the Netherlands, France and Finland, with support from the Commission of the European Communities.

## 5.6 PHYSICAL ACTIVITY

Physical activity includes both occupational and household activity and leisure activity (see Appendix). The **Canadian Fitness Survey Questionnaire** (16) is a self-reported questionnaire which assesses both short (e.g. 14 days) and long-term (e.g. 12 months) physical activity. Leisure-time activity only is also assessed. Specific components are: cardiorespiratory endurance, flexibility, muscular strength and muscular endurance, as well as body fatness. There is indirect evidence of validity and a variety of techniques were used to maximize the quality of the data.

## 5.7 CULTURE, LEISURE AND SOCIAL NETWORKS

### *Number of voluntary and community groups*

The number of existing local groups could be considered as an indirect measure of community involvement in initiatives and sometimes also in processes of decision-making in the locality. In some localities data could be

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available from Voluntary Services Councils and Youth Offices. However, there will be a number of small groups not known by those agencies and the information gathered is unlikely to be useful over a long period of time as it is likely that new local groups will be established while others cease to be active over the period.

*Use of various cultural/leisure facilities*

People's use of local facilities is a more useful measure than provision alone. Data on use of local cultural/leisure facilities could be obtained from a range of sources such as Councils' Education and Leisure Departments and Sports Councils, theatres, museums, etc. However the data do not indicate levels of unmet demand or, necessarily, specific levels of active participation.

## 6

# POPULATION TARGET GROUPS

### 6.1 YOUNG PEOPLE

An adolescent health profile intends to give an overview of key indicators of health, lifestyles and environmental factors relevant for the well-being of adolescents and of the use of health services. In 1993 in the Netherlands (17) several adolescent health profiles were constructed by means of mail questionnaire surveys and consensus groups. Both community and schools samples of adolescents were surveyed. To allow regional comparisons, for each profile reference populations were constructed correcting by age, sex and school level. Surveys were found to be cheap, easy to administer and valid instruments for the development of profiles.

In 1990 the English Health Education Authority commissioned a survey on the health and lifestyle of 16 to 19 year olds (Young Adults' Health and Lifestyle Survey (18)). The survey included sections on health and diet, smoking, alcohol, drugs and sexual behaviour and covered behavioural, attitudinal and social variables linked to the various health and lifestyle topics. The Post Office address file, stratified by region, was used for sampling. Interviews were conducted in-home. The questionnaire was partly face-to-face interview and partly self-report.

In 1986 and 1988 a survey on sexual knowledge, attitudes, fears and behaviours of 13, 15 and 17 year olds in Finnish public schools was carried out by means of a structured questionnaire (Kontula et al., 1992. The KISS study (19)). Two of the aims of the survey were to describe the sexual maturity, relationships, dating and sexual behaviours of 13, 15 and 17 year olds and to explain relationships between biological maturation, dating and sexual experiences and their relationship to adolescent health behaviour and general health lifestyles.

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## 6.2 ELDERLY PEOPLE

People over 65 represent a large percentage of the population in developed countries. In general, elderly people are more vulnerable to all kind of health hazards.

The health status and quality of life of elderly people can be measured using the instruments already described. Functional disability and social and quality of life measures particularly apply to the elderly.

Accidents are common among the elderly and housing conditions might determine their quality of life.

## 6.3 HOMELESS PEOPLE

Defining the homeless as people who sleep outside dwellings or in temporary shelter implies a too narrow perception of the condition of housing exclusion. Living conditions of homeless people may range from having no accommodation, temporary accommodation, insanitary dwellings, substandard dwellings and overcrowding, to insecure tenure.

In order to agree on the number of people excluded from adequate housing we need to agree on the socially acceptable standards of adequacy of dwellings. The same indicators of adequate housing do not necessarily have the same implications in all countries.

Although the concept of homelessness is intrinsically linked to the concept of adequate housing, homelessness is not simply a housing problem. It also has profound health implications, often being associated to ill health due to harsh living conditions. Little is known about the health behaviours of many of the less privileged members of the community, as such groups are underrepresented in lifestyle surveys.

In 1992 FEANTSA (Fédération européenne d'associations nationales travaillant avec les sans-abri : European Federation of National Organizations Working with the Homeless) published the first report on services to the homeless in Europe (20). Later, in 1993, a profile of Europe's homeless people was published. The data collected related to either 1991 or 1992 for each EU country. The report suggests that the number of homeless people recorded is likely to be an underestimation of the extent of homelessness and some explanatory reasons are discussed.

Efforts have been made by the services providers, scientific community and state authorities in the Netherlands and France to begin to gather systematic information about homelessness. In the Third Report of the European Observatory on Homelessness, FEANTSA highlights:

- Two and a half million of the Union's inhabitants are known to have been without shelter or in receipt of public or voluntary accommodation in 1993 – although it is suggested that national statistics on homelessness are inadequate and that the estimated homeless population in the Union might be close to five million.
- The age of people identified as homeless is falling and the number of women seeking assistance because they are homeless is growing.
- The right to a home, recognized as one of the basic human rights, has yet to be incorporated in the national legislation of member states.
- Because homeless people have no access to housing, they may have limited access to other basic human, civil and social rights.

A survey in 1991 amongst the “temporary” homeless population living in bed and breakfast hotels in London (21) covered six topics: physical health, mental health, accidents, health behaviour, service utilization and satisfaction with services used.

#### **6.4 ETHNIC MINORITIES**

Ethnicity defines a population which shares cultural and linguistic characteristics. Ethnicity needs to be used carefully to be a useful tool for health research. Senior and Bhopal (22) give nine recommendations for the use of ethnicity as a sound epidemiological variable.

Assessment of the health of minority ethnic groups is often restricted by methodological difficulties including the definition and categorization of ethnic groups and the lack of accurate population denominators. Surveys of the health of ethnic minorities depend on having an appropriate sampling frame for the groups under study (23).

Sources of bias should be taken into account when comparing ethnic groups. Classification based on names is usually more valid than classification based on place of birth as it allows to identify people from ethnic minorities born in the host country. Attention should be paid to rates of non-respondents. Unemployment rates may be higher in ethnic minorities than in native populations and occupational classification may be a misleading indicator of socioeconomic status as people from ethnic minorities may be more likely to have low status occupations not matched with their qualifications than the native population. Household ownership could be a more useful indicator when geographically adjusted.

# 7

## HEALTH AND ENVIRONMENT

The environment and health are inextricably linked. In 1992 the Earth Summit was held in Rio de Janeiro in response to widespread recognition that the world's population is living beyond its environmental means. Governments committed themselves to Agenda 21, a plan towards the achievement of sustainable development.

Impact assessment is increasingly used to predict the effects on the environment of new physical developments such as industrial plants, dams and highways. The potential effects on human health must be fully taken into account in such work. The criteria and procedures for monitoring and evaluating damage to the environment and to health are inadequate at present.

### 7.1 FOOD HYGIENE

To prevent foodborne infections, routine inspections of food premises involved in the production, preparation and sale of food intended for human consumption are carried out. Attention is paid to the structural suitability of the premises as well as to temperature control and the hygienic practices in the handling and preparation of food. Food quality and composition is also monitored by the sampling and analysis of food intended for human consumption.

Generally, departments of Public Health will hold records on outbreaks of waterborne diseases although the accuracy of the data depends on the number of episodes which may not be reported.

### 7.2 WASTE DISPOSAL

Generally Local Authorities hold records of waste collected. It would be useful to know the total waste stream, the means of disposal and percentage

of waste recycled. Landfill tips and incinerators for the disposal of waste can cause environmental damage by polluting air and water. Recycling and composting of waste could help to reduce the amount of waste for landfill.

### 7.3 AIR POLLUTION

Good air quality is a pre-requisite for good health and for the quality of the environment in general.

**Traffic pollution monitoring** should include: nitrogen dioxide NO<sub>2</sub>, carbon monoxide CO, ozone O<sub>3</sub>, benzene, sulfur dioxide SO<sub>2</sub>, NO<sub>x</sub>, lead and dust (black smoke).

**Multi-City Action Plan MCAP indicators** (WHO Healthy Cities) include: annual mean for each pollutant, percentage of 24 hours measurements above the guidelines for SO<sub>2</sub>, NO<sub>2</sub>, NO<sub>x</sub>, lead and dust and percentage of one hour measurements above the guidelines for CO and O<sub>3</sub>. In most cases provision of comprehensive local pollution data would require expensive equipment (with the exception of SO<sub>2</sub> and dark smoke, air quality monitoring requires the use of sophisticated scientific equipment that has a high capital cost).

NO<sub>2</sub> is a major pollutant in urban areas and a good indicator of emissions from motor traffic. Levels of NO<sub>2</sub> are relatively easy and cheap to collect. Usually levels are collected at different stations over a period of time. Diffusion tubes, which need to be sent off for analysis, do not give real time information. Periods with the highest levels are important because it is then when vulnerable people, such as sufferers from asthma and other respiratory diseases, are most at risk from health problems.

The European Air Quality Standard of 40 ppb (parts per billion) has been set to protect health and the environment while the EC Guide Level of 26 ppb has been set to improve the protection of health and to contribute to the long-term protection of the environment.

### 7.4 WATER QUALITY

The microbiological as well as chemical (nitrates, fluorine, benzene, chlorine) quality of the water supply should be ensured. Water quality is tested daily at the reservoirs and at points along the distribution system for colour, pH, chemical residuals including pesticides and total and faecal coliforms. Pollution incidents could then be monitored by cause. Generally, departments of Public Health will hold records on outbreaks of waterborne diseases although the accuracy of the data depends on the number of episodes which may not be reported.

In Britain, the National Rivers Authority holds information on river quality covering both chemical (suspended solids, dissolved oxides and nitrate levels) and biological parameters (species diversity and fish levels). There are no problems with the quality, validity and reliability of the data. Lead pipes represent a hazard and the age of the pipes may also affect water quality.

Sewage is the main pollutant of seawater. If untreated it causes deterioration of the microbiological quality of seawater and poses potential risks to animals and humans. The sewage is roughly screened at the main pumping station and at the primary treatment tanks the settlement of impurities takes place before the sewage is conveyed to a marine spoil ground.

## **7.5 NOISE**

High noise levels affect individuals' health. Road traffic is a major contributor. In specific working environments, high levels of noise are the cause of hearing loss. The strength of volume of a sound is measured in decibels for each octave wave band. A weighted scale (dBA) is used for translating the effects of sound on the human ear. The higher the noise level the greater the risk of hearing loss but the length of exposure does also play a part.

## **7.6 RADIATION**

The adverse effects of ionizing radiation on human health, particularly in relation to cancer, have been clearly demonstrated. However it is not always appreciated that the greatest public exposure to ionizing radiation comes from medical X-rays. Radon, a naturally occurring radioactive gas, is a major source of radiation exposure indoors.

Ultraviolet UV is a part of the non-ionizing region of the electromagnetic spectrum. The sun is the main source of UV radiation although there are also commonplace artificial sources.

Recent public and scientific concern about ozone depletion and increased UV radiation have lead to the establishment of many UV monitoring centres in the last few years. UV radiation affects people's skin (melanoma), immune system and eyes. When assessing health hazards associated with exposure to UV radiation a number of factors should be considered:

- the biologically effective radiation on the person exposed
- the duration and frequency of exposures and
- the individual sensitivity of the person to UV radiation.

The environmental effects of UV radiation are due to ozone layer depletion which could have serious consequences for living organisms. International guidelines (24) define exposure limits below which it is expected that nearly all people may be repeatedly exposed without adverse effects.

## 7.7 TRANSPORT

Motor traffic cause the majority of accidents affecting young populations. Motor traffic is also one of the major contributors to air pollution and thus it represents an important health hazard. The well-being of communities is also influenced by the degree of traffic congestion, vibration and noise caused by traffic.

A set of indicators to help assess the situation in cities could include:

- car ownership or household vehicle availability;
- availability of motorcycles and bicycles;
- public transport network cover: total number of Km served by public transport/total number of Km of streets x 100;
- accessibility to public transport: the percentage of the population with a specific level of accessibility to public transport services can be assessed using peak services and population data from the census (London Borough of Hammersmith and Fulham Council's Public Transport Accessibility Programme);
- length of bus priority lanes or bus-only roads;
- percentage of built up area covered by lorry bans;
- range of different mobility services available e.g. Dial-a-ride, Taxicard, Low-floor buses and the area they cover;
- taxi utilization;
- cycling: the bicycle is one of the most environmentally friendly means of transport available and measures could include the total length of paths reserved for cyclists/surface area of the city and the percentage of expenditure on transport devoted to cycle-ways and footpaths;
- car occupancy: what proportion of car trips made with only one occupant;
- the length of trips which are based on straight-line distances between origin and destination.

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## 7.8 ACCIDENTS

Accidents are a major cause of avoidable ill health, injury and death. They are the most common cause of death in people under 30 years and often are the cause of severe disabilities. Children, elderly people and people with disabilities are the most vulnerable groups. In many accidents alcohol plays a significant role. Many of the accidents are preventable.

### 7.8.1 Road accidents

Potential sources of information are:

- police road traffic accident statistics
- Department of Transport's road accident database
- ambulance services
- hospital accident departments and hospital in-patient data
- insurance companies data if available.

The accuracy of the information gathered from police records depends on the number of accidents which are not reported to the police. Information is provided on accidents related to alcohol consumption.

A minimum data set should be provided by hospital accident departments: age, sex, postcode, accident cause, location of accident, diagnosis, investigation and treatment. It should be possible to identify alcohol-related accidents.

In Dublin and other major European cities a multisectoral project ('Dubsafe') was set up to develop an information system to record accident data, particularly in relation to the location of the accident.

### 7.8.2 Accidents other than road accidents

1989 was the final year of the compilation of a centralized European database on home and leisure accidents (EHLASS project, European Home and Leisure Accidents Surveillance System). Accidents were reported from a number of hospital accident departments across EC countries. Information was collected on the location of accident, accident mechanism, activity in the moment of accident, involved products, etc. However comparisons cannot be made due to the fact that different Member States contributed to the system for different periods.

### 7.8.3 Occupational accidents

Occupational accidents are an important cause of personal loss in terms of fatalities, injuries and loss of working time. In industrialized countries the

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annual rate of reported occupational accidents is approximately 6 per 100 working people. Factors associated with accidents include environmental factors such as poor lighting, extreme temperatures, noise, working posture and inadequate ventilation.

## **7.9 WORKING ENVIRONMENT**

Satisfying work in a safe and pleasant environment positively affects health and well-being. Yet the physical and psychological working environment is all too often responsible for diseases and injuries.

In Sweden in 1990 a Health Risk Study Group was appointed to carry out a survey of those conditions in the work environment which give rise to work injuries in the broadest interpretation of the word. Its principal task was to identify the jobs at most risk (approximately 10% of all jobs). The report of the Study Group (25) includes a table of risk profiles for certain occupations (Appendix 3 pages 97–115).

## **7.10 URBAN ENVIRONMENT**

The quality of the built environment substantially influences people's lives.

The following could help describe the urban environment:

- accessibility to public buildings and other facilities for people with disabilities;
- pedestrian streets: total length of pedestrian streets/surface area of the city;
- relative surface area of green spaces in the city;
- public access to green spaces;
- number of trees in the locality.

## 8

# HEALTH AND SOCIOECONOMIC CIRCUMSTANCES

The factors relating to health and socioeconomic circumstances are the most difficult to define and the most challenging to measure.

## 8.1 EDUCATION

The educational level of the school-going population has been measured in most surveys by the level of the educational institution being attended while for those who have left school it has usually been defined by the highest degree or diploma obtained. However it is recommended that the number of years of schooling (full time education) be measured. The assessment of qualifications achieved has lower priority.

## 8.2 EMPLOYMENT

**Employment** is an important determinant of people's quality of life and well-being. Having a job allows people to obtain adequate food, to have access to appropriate housing and to be able to participate in social and leisure activities.

### **Families on benefits/low incomes**

Although benefits data could provide a good picture of trends, it is not considered valid as a measure of poverty since many people who are eligible for benefits do not claim them. The total number of people eligible for benefits can be approximated from national research. It is possible to assess the percentage of families with an income under a defined cut-off point.

## **Unemployment**

It is well documented that there is a relationship between unemployment and ill health with the unemployed having an excess morbidity and mortality. As reported by Martikainen (26), in Finland unemployment seems to have an independent causal effect on male mortality. Furthermore the effects of unemployment on mortality were more pronounced with the duration of unemployment. Results from the British Regional Heart Study show the effect of loss of employment on mortality in a group of middle aged British men (27). An increased risk of mortality even after controlling for a wide range of background variables was found.

In assessing the influence of unemployment on health it is important to consider the role of relative poverty, social isolation and loss of self-esteem, health-related behaviour and the effect that previous unemployment has on subsequent employment patterns.

Rates of long-term unemployment should be easily obtained from published sources. However the reliability of that data has been questioned, mainly when definitions of unemployment and methods of counting change so frequently. The International Labour Organisation (ILO) definition should be used whenever possible.

## **8.3 HOUSING**

Housing conditions influence people's physical and mental health and overcrowding in housing has long been associated with ill health.

Suitable housing is a basic need for every individual. It has a considerable influence on their quality of life. Dwellings should give sufficient protection against damp, cold, heat and noise. They should have sufficient daylight and sufficient ventilation and heating. Furthermore, sufficient drinking water should be available and there should be appropriate drains for waste water and access to lavatories.

There are some indicators which can provide a picture of the local housing situation e.g. number of rooms per inhabitant, number of square metres of living space per inhabitant, percentage of dwellings without a bathroom, percentage of people living in substandard dwellings (those which do not have exclusive use of toilet and bath or shower and/or do not have tap water inside the dwelling).

Housing information could be obtained from:

- census data (e.g. characteristics of the dwellings related to the number of households);

- 
- technical surveys (e.g. assessment of physical and environmental damage); and
  - local household surveys (e.g. self-reported health).

### *Some examples of housing surveys*

In the Questionnaire Survey carried out in Copenhagen people were asked if they were feeling exposed in their dwelling to damp, drafts or cold, poor indoor climate, noise from street, trains and aeroplanes, noise from factories and poor drinking water as well as if they were satisfied with their dwelling. They were also asked if they were feeling exposed in districts to air pollution from traffic or factory.

The health consequences of dampness in housing have been investigated (28). The Scottish House Condition Survey (29) assessed the housing stock, socioeconomic characteristics, the “tolerable standard”, amenities and services, disrepair and condensation, dampness and mould.

In Glasgow a research project is being undertaken looking at the health, economic and social benefits experienced by low income tenants after their houses were improved. Dwellings suffering from cold, damp, condensation and mould will be surveyed before and after receiving substantial energy and capital investment. A questionnaire will be administered by trained interviewers and a number of indoor air quality parameters such as house mites and humidity levels will be measured pre and post-improvements. A number of dwellings will also be assessed as a control group.

## **8.4 SOCIOECONOMIC AND HEALTH INEQUALITIES**

Socioeconomic and health inequalities occur throughout the industrialized world. Equity in health and equal access to health care for disadvantaged groups became, in 1984, the first of 38 Regional Targets for health for all, adopted by all EC member states.

Differences in health between socioeconomic groups is the first step in identifying inequalities in health. There are still serious deficiencies in the data available on the health of social and economic groups from many European countries. Socioeconomic status is either determined by educational level, occupation and/or income.

Various methods have been employed to measure inequalities in health but only two of them have been reported to be likely to present an accurate picture of socioeconomic inequalities in health; the others have been criticized as unreliable (30). Both methods – the slope index of inequality and the concentration index – provide a measure of the extent of inequalities in

health that are systematically associated with socioeconomic status as people are ranked not by their health but by their socioeconomic status. They reflect the experiences of the entire population not only that of specific social classes and they are sensitive to changes in the distribution of the population across socioeconomic groups.

An international comparison of socioeconomic differences related to reported health was conducted in the Netherlands (31) based on survey data from six EC countries, the Nordic countries, Canada, the US and Japan. Most countries used educational level as the socioeconomic indicator while five countries also provided data on health status by occupation or income level (the Netherlands, Norway, Sweden, the UK and Spain). In all countries with educational and income data, the classification of these indicators was strictly hierarchical which allowed comparisons between countries. For the purpose of the study data were requested on nine health indicators asking about the proportion of the respondents reporting the health problem, by age, sex and socioeconomic group.

National indicators of social equity are not sufficient to assess inequalities in local populations. There is a need for social equity indicators based on smaller areas and on the situation of vulnerable social groups, as well as a greater volume of descriptive and qualitative work which could help to understand or explain the processes linking socioeconomic experience with health outcomes in individuals, groups and populations.

## **8.5 DEPRIVATION INDICES**

Some analyses of population health have adopted the use of area measures as a means of examining the variations between populations in terms of socioeconomic characteristics. In general, the deprivation indices measure the proportion of households within a small geographical area which are characterized by a combination of circumstances indicating low living standards and/or a high need for services. Strong association is shown between deprivation and mortality and morbidity measures and demand for health care.

## 9

# CONCLUSION

This document is intended as a framework for deciding on health measurement instruments. Although a range of tools and sources of health information already exists and a lot of work has been done, it is extremely important to choose the instrument appropriate to the purpose of the task in hand.

More evidence of the validity and reliability of some of the health status and quality of life measures is needed, especially in the field of social and quality of life measures and there is a need for practical and useful tools to assess the impact of the environment on human health at local level.

For the future, it will be important to extend this survey to include material in languages other than English.

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# APPENDIX

## Measurement methods and instruments for some regional health for all indicators recommended for use in health interview surveys

*The following are illustrative questions for gathering information on health indicators by means of health interview surveys.*

### Alcohol consumption

1. How long ago did you last have an alcoholic drink?
  - (a) During the last week
  - (b) One week to a month ago
  - (c) One month to three months ago **Go to 2**
  - (d) Three months to twelve months ago
  - (e) More than twelve months ago **End**
  
2. During the past (week, two weeks, etc.) on how many days did you drink alcohol, such as (list culturally specific illustrations)?

Number of days
  
3. On the days that you drink alcohol, how many (drinks, glasses, etc.) did you have, on average?
  
4. Was your drinking in the past two weeks typical of your usual drinking in the past year?

Yes **End**

No **Go to 5**
  
5. Was your drinking in the past two weeks more or less than your drinking in the past year?

*If the survey is conducted during a short calendar period and if a typical drinking pattern characterizes that period in the country, the wording of the questions should take that into account.*

6. Please indicate on the following list which alcoholic beverages you drank the last twelve months (even if only once)?
  - beer (excluding non-alcoholic beer)
  - wine, sherry, port, vermouth
  - liqueur, advocaat, blackcurrant, lemon-flavoured gin
  - gin, brandy, cognac, whisky, vodka
  - long drinks
  - low-alcohol beverages
  - I have not drunk any alcohol in the last twelve months
  
7. During the last six months, have you ever had six or more drinks containing alcohol in one day?

Yes/No

If Yes:
  
8. During the last six months, how often have you had six or more drinks containing alcohol in one day?
  - every day
  - 5–6 times a week
  - 3–4 times a week
  - 1–2 times a week
  - 1–3 times a month
  - 3–5 times in six months
  - 1–2 times in six months
  
9. Do you usually drink alcohol on weekdays (i.e. Monday–Thursday)?

Yes/No
  
10. On how many of the four weekdays (i.e. Monday–Thursday) do you usually drink alcohol?
  - 1 day
  - 2 days

- 
- 3 days
  - 4 days
11. How many glasses on average do you drink on such a day (i.e. Monday–Thursday)?
- 11 glasses or more, namely \_\_\_\_\_ glasses
  - 7–10 glasses
  - 6 glasses
  - 4–5 glasses
  - 3 glasses
  - 2 glasses
  - 1 glass
12. Do you usually drink alcohol in the weekend (i.e. Friday–Sunday)?
- Yes/No
13. On how many of the three weekend days (i.e. Friday–Sunday) do you usually drink alcohol?
- 1 day
  - 2 days
  - 3 days
14. How many glasses on average do you drink on such a day (i.e. Friday–Sunday)?
- 11 glasses or more, namely glasses
  - 7–10 glasses
  - 6 glasses
  - 4–5 glasses
  - 3 glasses
  - 2 glasses
  - 1 glass

### **Tobacco consumption**

*The following questions are recommended to assess the proportion of non-smokers, light smokers and heavy smokers in the population.*

1. Do you smoke?
- Yes, daily

- Yes, occasionally (skip 2)
  - No (skip 2)
2. How many cigarettes do you usually smoke on average each day?
- Less than 20
  - More than 20 (Heavy smoker)
3. If the answer was No to Question 1: Have you ever smoked?
- Yes, daily
  - Yes, occasionally
  - No (skip 4 and 5)
4. How long ago did you stop smoking?
- Less than 2 years ago
  - Two years ago or more
5. To current smokers identified by question 1:  
Compared with 2 years ago would you say you now have reduced smoking?
- Yes/No

### **Distribution of Body Mass Index (BMI)**

*Health interview surveys are very practical sources for BMI estimates = weight in kg/height in m<sup>2</sup> (Quetelet) and thus assess the prevalence of obesity and underweight.*

1. What is your height without shoes? \_\_\_\_\_ cm
2. How much do you weigh without clothes and shoes? \_\_\_\_\_ kg

### **Physical activity**

#### **Leisure-time activity:**

1. What describes best your leisure-time activity during the last year?
  - hard training and competitive sport more than once a week
  - jogging and other recreational sports or heavy gardening, at least 4 hours a week
  - walking, cycling or other light activities at least 4 hours a week

- 
- reading, watching TV or other sedentary activities
2. At least once a week do you engage in any regular activity, such as jogging, cycling, etc. long enough to work up sweat? If Yes, how many days per week?

***Basically there are two disability measures as indicators of the “healthfulness of life”: short-term disabilities and long-term disabilities.***

### **Long-term disability**

*In order to obtain the percentage of the population experiencing different levels of long-term disability, long-term disabilities are measured by inquiring as to limitations in the performance of certain activities or by simply inquiring whether the respondent has a long-term disability and if so, what kind of disability it is.*

*The following are illustrative questions to assess long-term disability.*

### **Mobility**

- Are you permanently confined to bed even though there may be help to get you up?
- Do you sit in a chair (not a wheelchair) all day even though there may be help for you to walk?
- Are you confined to your house/flat and garden?

### **Locomotion**

What is the furthest you can walk on your own without stopping and without severe discomfort?

- only a few steps (Higher)
- more than a few steps, but less than 200 metres (Lower)
- 200 metres or more (No disability)

### **Transfer to bed/chair**

Can you get in and out of bed/a chair on your own

- without difficulty (No disability)
- with some difficulty (Lower)
- or can you only get in or out of bed with someone to help you? (Higher)

**Dressing**

Can you dress and undress yourself on your own

- without difficulty (No disability)
- with some difficulty (Lower)
- or can you only dress and undress with someone to help you? (Higher)

**Washing**

Can you wash your hands and face on your own

- without difficulty (No disability)
- with some difficulty (Lower)
- or can you only wash your hands and face with someone to help you? (Higher)

**Feeding**

Can you feed yourself including cutting up food

- without difficulty (No disability)
- with some difficulty (Lower)
- or can you only feed yourself with someone to help you? (Higher)

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**Toilet**

Can you get to and use the toilet on your own

- without difficulty (No disability)
- with some difficulty (Lower)
- or can you only get to and use the toilet with someone to help you? (Higher)

**Continence**

Do you ever lose control of your bladder?

- No (No disability)
- Yes, Do you lose control of your bladder at least once a week (Higher)
- less than once a week, but at least once a month (Lower)
- or less than once a month? (No disability)

**Hearing**

Is your hearing good enough to follow a TV programme at a volume others find acceptable?

- Yes (No disability)
- No, Can you follow a TV programme with the volume turned up?
- Yes (Lower)
- No (Higher)

**Seeing**

Can you see well enough to recognize a friend at a distance of four metres (across a road)?

- Yes (No disability)
- No, Can you see well enough to recognize a friend at a distance of one metre (at arm's length)?
- Yes (Lower)
- No (Higher)

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**Disability Free Life Expectancy (DFLE)**

*It is recommended that Sullivan's method as described in **World Health Statistics Quarterly** 1989; 42, No 3, 148 be used to calculate the life expectancy free from disability.*

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