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**HOW TO IMPROVE INTERNATIONAL COMPARABILITY OF HEALTH SURVEYS:
THE ROLE OF HEALTH EXAMINATIONS**

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1. In order to serve health policy and planning information on health and its determinants must be comparable between regions, countries and over time. Thus, health data should be comprehensive, valid and comparable. National health surveys are the main means for obtaining the necessary data ranging from health determinants and risk factors, through symptoms, health status and use and need of health care and medicines to functional capacity and its limitations. Health examination methods are the main component in national and international medical research. However, so far there are few national health examination surveys (HIS/HES) in Europe and most surveys are carried out using questionnaire or interview methodology alone (HIS). Examples of national health examinations range from surveys carried out as adjuncts to a national health interview survey in the United Kingdom and the Netherlands, the relatively broad examinations of the German Health Survey and the comprehensive surveys with a large HES and HIS component in Finland (the Mini-Finland survey in 1978-80 and the Health 2000 survey in 2000-2001)(Aromaa et al 2003a and b).

2. Comparisons of the concepts, measures, wordings and findings of various national HISs have repeatedly shown that their comparability between surveys and countries is poor (Aromaa et al 2003a and b). Recent proposals have concentrated on improving conceptual clarity and similarity, similar wordings and common questions (Nosikov et al 2003, Robine et al 2002). Current examples are the proposed European Health Modules. However, part of the poor

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comparability of the HISs can be traced back to differences in samples, survey execution and widely varying response rates (see below).

3. Health examination (HES) methods can contribute to good coverage, validity and comparability in several ways. First, some data on health and its determinants can only be obtained by health examination methods. Second, often the validity of health examination methods is better than that of health interview measures describing the same topics. Third, in regard of many health examination measures quality assurance is better established and easier to implement than in regard of HIS measures. Finally, health examination methods add an independent measure of the health aspect in question, which makes it easier to interpret the validity of the overall findings and comparisons.

4. Some risk and protective factors, health states and diseases, and functioning can only or best be measured by HES methods. In this context HES methods are understood to comprise a range from determinations on blood samples through various functioning tests to clinical diagnoses. Some examples of the determinations on blood samples are those concerning serum lipids, serum glucose, and several biomarkers of nutrients derived from food. Other measurements such as those concerning blood pressure, respiratory function (spirometry), ECG, obesity, sight and hearing, reaction time, walking speed, and joint function have been used in HESs and describe reasonably well aspects of physiological functions and of general functional capacity. Assessment of cognitive capacity requires the use of various psychological tests many of which are based on questionnaires and interviews but which fall into the category of HES.

5. Many of the above methods can, in principle, be standardized relatively easily, and at least easier than interview methods. To obtain valid laboratory results it is sufficient to standardize the process from length of fasting and sample collection through storage to the laboratory analyses. Currently, the weakest link in Europe is the lack of a reference laboratory scheme, which would not be difficult to set up. For measurements it is sufficient to employ standard techniques and to train the observers. Standardization of many tests requires valid apparatus and comparable conditions. If the impact of the observers is important, such as in blood pressure measurement or spirometry, the same instructions, training and quality assurance is needed. Examples of internationally standardized measurement are available in the WHO Monica surveys and the report of the European Health Risk Assessment –project (EHRM).

6. Some well-established symptom questionnaires (e.g. angina pectoris and chronic bronchitis) can be labeled ‘diagnostic’ in the sense that a person fulfilling the criteria has a great likelihood of suffering from the condition in question. Recommendations for performing them are available in books published by WHO (Rose and Blackburn 1968).

7. Most of the above measurements can be standardized to a much higher degree than typical interview questions. In addition many of them provide information unavailable from any interview.

8. To estimate the presence or absence of diseases and disorders or to assess the degree of complex functional limitations requires examination and observation by appropriately trained persons such as doctors and physiotherapists. The currently employed alternatives are questions in an interview. To estimate diseases a well standardized history and examination protocol and well trained doctors are needed. However, it has been shown that the correlation between several doctors’ diagnoses is only of the order of 0.70. From the point of view of validity both doctors’ diagnoses and interviews perform best in identifying cardiovascular diseases and have most difficulty in establishing the presence or absence of mental disorders. The agreement between

doctors' diagnoses and interview data is best in regard of cardiovascular diseases, second best for musculoskeletal diseases and worst for mental disorders (Heliövaara et al 1993). The clarity of diagnostic criteria and the consequent clear transfer of the diagnostic information from health care professionals to patients explains these findings. However, without doubt the doctors' diagnostic assessments or a trained person's estimates of functioning are more valid than disease histories or interview information obtained from the person in question.

9. The assessment of mental disorders has been the subject of long-term development work. Several recommended methods for population surveys exist (e.g. General Health Questionnaire, Beck Depression Inventory) and still others have been recommended for clinical-scale research (SCID). The most recent WHO recommended method for population studies is the CIDI to diagnose major mental disorders. All of these methods are based on questionnaires or interviews. They are so extensive that they are best applied in the context of health examinations and therefore they are here labeled HES methods.

10. The general aspects mentioned above resulting from use of health examination methods i.e. better validity, more straightforward standardization, the addition of independent measures and the attraction to people resulting in higher response rates suggests that a combination of HIS and HES is superior to a HIS alone. On the other hand, it is also more expensive and complex. Also, HES methods have drawbacks particularly in being limited to information concerning the specific point in time of the survey. Interviews can go back to much longer periods of time. This observation stresses the need to combine the two.

11. The recommendations of the numerous projects under the previous EU Health Monitoring Program clearly suggest the need for applying both HIS and HES methods, as appropriate. As stated above measurement of risk factors and protective factors is straightforward and so is the measurement of the concentrations of medicines in serum. Practical methods for measuring functional capacity are also available. In regard of diseases and impairments a number of conditions can potentially be included in a national HES:

12. Disease and impairment list:

CHD	resting ECG, chest pain symptom questionnaire, medicine use
Respiratory disease, overall	spirometry/PEF
Asthma, allergic	spirometry + bronchodilation, skin tests, blood sample (IgE)
Chronic bronchitis	symptom questionnaire
Obesity	weight and height, waist and hip measures
Hypertension, high BP	blood pressure measurement, medicines used
Diabetes, hyperlipidemia	fasting blood sample (glucose, lipids), medicines used
Hyperuricemia	blood sample (uric acid), medicines used
Rheumatoid arthritis	blood sample (RF), medicines used
Allergies	skin tests, blood sample, medicines used
Mental health	symptom questionnaires, diagnostic questionnaires, medicines used
Alcohol dependency	questionnaire, blood sample (gamma-GT)
Substance dependence	blood sample, urine sample

Urinary tract infection used	urine sample (culture and/or dip stick), medicines
Osteoporosis	ultrasound (and/or x-ray?), DEXA) exam. of bone density, medicines used
Dementia	question series
Vision	visual acuity (near, distant, dim light)
Hearing	audiometry
Physical functioning and disabilities	tests, observations

It is feasible to include all of the above or some of them in national or international HIS-HES surveys.

13. Regardless of the general approach some design and implementation enhancements are a necessity. Most European health interview and health examination surveys are characterized by too low response rates. Typical response rates range from 60 to 70 percent although it is well known that this leads to biased results as people at higher risk or those suffering from functional limitations tend to be over-represented among the non-participants. Despite the time trend of decreasing participation rates recent Finnish experiences suggest that a combination of HIS and HES can yield a participation rate of over 85 percent (Aromaa and Koskinen 2002). Intensive efforts to increase participation from the current low levels should be encouraged in all countries. Household surveys usually do not include institutionalized people although a large part of morbidity, disability and need for care is concentrated in this group. Instead of targeting households alone it is advisable to draw samples covering the whole population. There is no reason to believe that the total population approach is not feasible in most countries (Aromaa et al 2003a).

14. To achieve good international (and temporal) comparability requires international collaboration as suggested e.g. in the final report of the EU HIS/HES –project (Aromaa et al 2003). These efforts should be directed toward joint HIS and HES surveys whenever feasible. In addition to agreeing jointly on the methods collaboration in the planning, design, training and quality assurance of surveys is needed. This means that the now independent planning and preparation of national surveys should be supplemented by joint efforts. To organize these is a natural task of the EU Public Health Program and Eurostat who should join with experienced national Public Health Institutes and Statistical Offices. In due course this will lead to standardized protocols, similar population samples and good quality implementation. Finally, these efforts can be expected to result in higher response rates and improved validity and comparability between the Member States.

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