Globalisation and Health in Europe: Harmonising Public Health Practices

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Workshop 11: Monitoring of Cardiovascular Diseases: results of the EUROCISS project

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EUROCISS Research Group
The aims of the European Cardiovascular Indicators Surveillance Set Project – EUROCISS – were to identify, using existing data-sets, the essential information required to objectively define the burden of cardiovascular diseases (CVD) and to recommend indicators and standardised methods for future data collection in the European Union (EU). Such standardisation will permit cross-country comparisons to improve the prevention and control of CVDs.

The objectives of EUROCISS included:

- the identification of specific indicators for assessing morbidity;
- the development of recommendations for collection and harmonisation of data that could be easily applied within the EU different countries and would provide reliable and significant data for monitoring cardiovascular diseases.

Although CVDs have been identified as one of the leading contributors to the global disease burden in Europe, few reliable and comparable indicators are currently available. An inventory of the available indicators and data sources from the participating countries was defined, as well as a list of specific CVDs of public health interest requiring surveillance. Further potential indicators and alternative
methods of data collection were added to the inventory. Based on the results of the inventory, a set of recommended indicators was selected, using the criteria of relevance, validity, sensitivity and reproducibility.

The EUROCISS Project has been implemented by a Working Group under the co-ordination of the Istituto Superiore di Sanità, Centre of Epidemiology, Surveillance and Health Promotion, Rome, Italy, with the financial support of the European Commission within the Health Monitoring Programme.

EUROCISS Research Group
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The burden of cardiovascular diseases in Europe
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Background
Cardiovascular disease (CVD) represents a major cause of mortality, morbidity and disability, and preventable risk factors have been well-documented. For these reasons, CVD is of major interest for public health programmes. The most important CVDs are ischaemic heart disease (acute myocardial infarction, acute coronary syndromes, angina pectoris and other forms of coronary heart disease), heart failure, and cerebrovascular disease (ischaemic and haemorrhagic stroke).

Methods
Within the EUROCISS project, an inventory of sources of information on CVDs available at European and country levels has been developed. At the European level, the WHO–HFA and WHO–MONICA databases are easily and freely accessible in the Internet. To ascertain data availability at country level, a questionnaire was sent to project partners, with the request to describe the available data sources on each disease, the scope of existing studies or surveillance systems (geographical area, temporal duration, age range, population). The adopted methodologies (case definition, ICD coding for mortality and hospital discharge records, linkage and validation methods), and the morbidity indicators (attack rate, incidence, prevalence, case fatality rate).

Results
The WHO–HFA database provides information for routine statistics: the available data demonstrates that CVDs are a major contributor to mortality, morbidity and disability, and the preventable risk factors have been well-documented. For these reasons, CVD is of major interest for public health programmes. The most important CVDs are ischaemic heart disease (acute myocardial infarction, acute coronary syndromes, angina pectoris and other forms of coronary heart disease), heart failure, and cerebrovascular disease (ischaemic and haemorrhagic stroke).

Conclusion
A monitoring system collecting comparable and valid population based data is essential to evaluate time trends and population differences in IHD and implement prevention activities in Europe. Such systems presently cover only a small part of the European population. The recent introduction of new, more sensitive diagnostic criteria for AMI highlights the need of valid and comparable data on disease incidence.

Recommended indicators for monitoring acute myocardial infarction and ischemic heart disease
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Background
Ischemic heart diseases (IHD) and acute myocardial infarction (AMI), are major public health problems and leading causes of death in Europe. In recent decades, IHD mortality and incidence of AMI have declined in Western European countries, while in other countries these diseases have increased.

Methods
Indicators for assessing the disease burden from AMI and IHD in Europe have been identified by the EUROCISS project. An inventory of available data in 14 European countries has been developed.

Results
A population based surveillance of AMI requires reliable and comparable information on disease incidence/attack rate, mortality and case fatality. Today such information is available at a regional level in some European countries. Only routinely collected mortality and hospital discharge data are available for all EUROCISS countries. In some Nordic Countries, information on incidence and case fatality of AMI is available at a national level through a simplified record linkage method based on national registers of hospital discharges and deaths. This method has been validated using MONICA data or in other ways. Prevalence of angina pectoris or heart failure is assessed in some countries by surveys, but information on important clinical measures is often lacking.

Conclusion
A monitoring system collecting comparable and valid population based data is essential to evaluate time trends and population differences in IHD and implement prevention activities in Europe. Such systems presently cover only a small part of the European population. The recent introduction of new, more sensitive diagnostic criteria for AMI highlights the need of valid and comparable data on disease incidence.

Recommended indicators for monitoring stroke and other cerebrovascular diseases
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Background
Stroke represents approximately 10% of total mortality and 25% of cardiovascular mortality in the European population. Even more important than mortality is morbidity, since a stroke often requires prolonged hospitalisation and often results in permanent disability. The purpose of this presentation is to suggest indicators and data sources for monitoring stroke in Europe.

Methods
Indicators for assessing the disease burden from stroke in Europe have been identified by the EUROCISS project. An inventory of data available to monitor these indicators in European countries has been developed.

Results
The most reliable way to monitor the occurrence of stroke events is to use a population-based stroke registry, although few countries currently have them. Some of the existing registries were initiated as part of the WHO MONICA Project. A limitation of stroke registries is that they are labour-intensive; for this reason, most cover only limited geographical areas. Based on record linkage of hospital discharge diagnoses with mortality data, validated by standardised diagnostic criteria, they usually cover a single region and the age range 35–74 years. Only the Nordic Countries have stroke registers at national level, although they are not based on standardised data collection procedures. Moreover, re-hospitalisations for elective investigations or rehabilitation purposes often receive the same ICD code as an acute stroke, making the identification of recurrent stroke events somewhat unreliable. Currently, nearly all patients with an acute stroke have either MRI or CT investigation, improving the ability to distinguish between hemorrhagic and ischaemic strokes. Recommended indicators of stroke include mortality, hospital discharge rate, incidence/attack rate, case fatality, and prevalence. Of these indicators, mortality and hospital discharge diagnoses are available for all countries. Information about incidence/attack rate and case fatality of stroke is available in some countries through registries; prevalence is assessed by cardiovascular surveys, health interview surveys and health examination surveys. Special surveys...
at 1 year follow-up of stroke patients are recommended to evaluate the functional disability and the quality of life.

Conclusions
Population-based registries are the best and most feasible source of stroke data at population level. The high cost limits their implementation at a national level; therefore they should be established in representative areas of a country. Record linkage of the hospital discharge registries with the mortality can be used but need to be validated.

Recommended indicators for monitoring heart failure and other forms of heart disease

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Background
The aging of the population and the advance in treatments have resulted in an increasing prevalence of chronic forms of ischaemic heart disease. Because of their frequency and impact, it is highly important to monitor the occurrence of both acute and chronic forms of heart disease. Heart failure (HF) is the leading diagnosis in hospital admissions among patients of 65 years and over; in addition, recent interest has been focused on HF for the poor quality of life among affected patients and the high cost associated with the disease. The purpose of this presentation is to suggest indicators and data sources for monitoring incidence and prevalence of HF and other forms of heart disease.

Methods
An inventory of HF data in European countries has been developed within the EUROCISS project. No specific indicators for HF are currently available from routine health statistics. However data for mortality and hospital discharge records exist at county level.

Results
In hospital discharge records, HF can also be found under the following diagnoses: hypertensive heart disease, primary and secondary cardiomyopathies, and chronic cor pulmonale. Therefore, if validation studies on HF mortality and hospital discharge are carried out, these causes should be taken into account. To obtain an exhaustive overview regarding HF, not necessarily requiring routine hospitalisation, review of medical records of primary care physicians and cardiovascular surveys will be necessary. Other indicators can be used as a proxy to measure the burden of the disease if integrated with other sources of information, e.g. national consumption of medications used to treat heart failure and its complications. Among the recommended indicators, functional disability and quality of life are suggested in patients with HF.

Conclusions
HF is a frequent complication of myocardial infarction and hypertensive disease. Hospital discharge diagnoses are not sufficient to evaluate the frequency of HF. For this reason, review of medical records of primary care physicians and cardiovascular surveys are suggested. Validation studies are recommended.

The Italian Register of Cardiovascular Diseases

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Background
It has been demonstrated that the MONICA registries, although highly accurate, require sophisticated system of validation for the events. However, implementing such procedures on nationally representative data is expensive. The Italian Group of the MONICA project has developed a method to estimate the occurrence and fatality rate for coronary and cerebrovascular events, linking hospital discharge and death records. ICD codes, which are weighted according to positive predictive values assessed in a sample of 1000 coronary and cerebrovascular suspected events classified through the MONICA categories in each centre.

Methods
Eight areas representative of the North, Centre and South of Italy have been enrolled. Two of them are urban areas (Rome and Naples), two are regions (Friuli Venezia Giulia and Veneto), three are small cities (Caltanissetta, Modena and Firenze) and one is a mixed urban-rural area (Brianza). Following the simplified methodology fatal and non fatal events were identified and checked for re-hospitalisation of the same events. Attack rates were assessed weighting the ICD codes corresponding to the predictive values estimated applying the MONICA diagnostic criteria (algorithm based on duration and localisation of symptoms, ECG findings, cardiac enzymes and for fatal cases, autopsy diagnoses). The MONICA categories of definite non-fatal cases and definite, possible and insufficient data with ICD codes included within ICD-9 410–414 for fatal coronary events were included in the definition of attack rate.

Results
Attack rates per 10 000 for fatal and non-fatal events are reported in the table.

Conclusions
To evaluate the health status of a population, surveillance of cardiovascular events data on prevalence of risk factors are needed. Population-based registers represent the best and most feasible source of morbidity data at a population level; they can be used to calculate key indicators such as attack rate and case fatality. Incidence can be assessed if information on first event is available. If survival rates are available, prevalence can also be assessed. The high cost of the registers limits their implementation at national level; therefore they should be established in representative areas of the country. The use of the simplified MONICA procedures proposed above provides the possibility of establishing expanded networks of representative areas for surveillance purposes.

The Italian CABG Project – Short-term outcomes in patients with Coronary Artery Bypass Graft Surgery: a preliminary analysis

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Objectives
Recently, the Italian Ministry of Health has become increasingly interested in the evaluation of outcomes of medical procedures, including coronary artery bypass graft (CABG). In late 2001, the Istituto Superiore di Sanità (ISS) therefore began a national prospective study on the short term outcomes (mortality within 30 days) of CABG procedures with the aims of 1) describing the observed and expected mortality at 30 days of the intervention for each cardiac surgery unit, adjusting by the individual risk of the patients; 2) comparing different models of risk adjustment.

Materials and methods
A list of all Italian cardiac surgery centers was prepared, and each site was contacted to elicit their participation in the study. For each patient undergoing a CABG, the centers were requested to provide data on details of the procedure, haemodynamic condition before surgery, certain comorbidities, history of recent myocardial infarction and unstable angina, ventricular function and whether the CABG procedure was performed on an emergency basis; they were also subsequently asked to provide information on vital status at 30 days. Centers have the option of electronic data entry on a password-protected website or sending data directly to the ISS. To determine the best risk adjustment model, a model was developed using a multiple logistic analysis with backward procedure. This model was then used both to compute 1) indirect standardization, that permit comparison of the adjusted mortality rate of each center with that of the entire population undergoing CABG at the participating centers and 2) direct standardization, which permits the development of a reference standard against which the performance of each center can be compared.

Results
Of the 88 Centers assessed, 78 agreed to participate, although only 62 had sent their data at the time of this analysis. Of the 17,071 CABG interventions available for this preliminary analysis, 7,124