



Fighting Widespread Diseases The Health Platforms MONICA and KORA

The GSF has been running a health research platform in the Augsburg area for just over 20 years. Physicians, epidemiologists, statistics and genetics experts take a close look at widespread diseases, such as diabetes, cardiovascular diseases or allergies. In large study populations selected to be representative for the population as a whole, the scientists investigate not only the classical risk factors, but also dietary habits, physical activity, psychosocial factors and the utilization of medical care.

The first main project was started in the seventies with the aim of developing an internationally binding, uniform study protocol for the measurement of the important risk factors, such as smoking, high blood pressure and overweight. Twenty-eight countries from four continents participated in this MONICA study of the World Health Organization, which was planned for a period of ten years. MONICA stands for Monitoring of Trends and Determinants in Cardiovascular

Disease. It was for a good reason that Dr. Ulrich Keil, head of the working group Epidemiology of what was then the GSF Institute of Medical Computer Science and System Research, chose the Augsburg region as a location for one of the four German MONICA centers: Augsburg has a large modern hospital as a treatment center, the population structure corresponds to conditions in Germany, and there are particularly few people entering and leaving the region.



From the population register of the Augsburg region more than 18,000 25- to 74-year-old test subjects have been selected as a representative sample in the KORA Health Platform up to this day. The KORA scientists collect data on the classical risk factors, such as high blood pressure or overweight, but also psychosocial factors and various blood parameters. The anonymous data are available to all scientific KORA partners involved in various substudies.

In the so called acute coronary event register of Augsburg, its head Dr. Hannelore Löwel from the GSF Institute of Epidemiology, has been recording all patients with a fatal or non-fatal acute myocardial infarction as well as all those who died suddenly before reaching a hospital since 1985.

Health Awareness Still Low

"For men the risk of suffering a myocardial infarction starts to rise considerably from about 40 years of age, for women from 55," says Löwel. "For women this risk is principally much lower. However, the still very low risk of younger women is rising continuously – probably because they increasingly start smoking at a much younger age and many also take oral contraceptives. But on the whole the rate of myocardial infarctions in men and older women has gone down. Health awareness, however, is still incredibly low. This often reminds one of gambling behavior: "Most people hope not to become ill despite the risk," Löwel criticizes. This passive attitude is found particularly frequently among patients with high blood pressure, who show an unchanged high number of myocardial infarctions. Only about half of these people know about their blood pressure, and of these only about 50 per cent receive drug treatment, and only about half of these go down to normal blood pressure as a result.

Big-Style Cooperative Health Research

In 1996, when the WHO's MONICA study ended, the GSF decided to continue its health research in the Augsburg Region in KORA (Cooperative Health Research in the Augsburg Region). Thus, the first German cohort study, comprising nearly 14,000 persons, on the question what the connection between typical risk factors and myocardial infarction is was established as a long-term project. As for MONICA, the GSF has the scientific control over the overall project, Klinikum Augsburg continues to be the partner for most laboratory analyses. KORA received its own study center which is headed by Dr. Christa Meisinger. Prof. H.-Erich Wichmann, Director of the GSF Institute of Epidemiology, acts as spokesman of KORA.



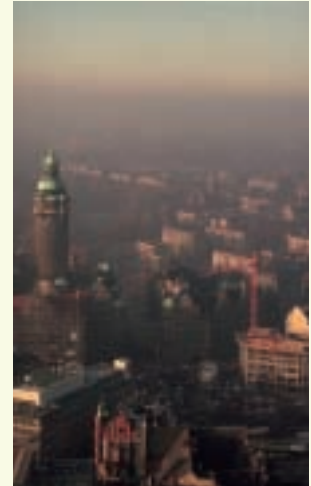
For the assessment of the time trends of the risk factors for cardiovascular diseases, KORA can use the MONICA data. "Due to this unique and excellent data quality management we can evaluate the stored biosamples and data according to new aspects even today. Other partners can join the project on the basis of scientific cooperation assignments," says Löwel.

More Heart Attacks With High Air Pollution

20 years of MONICA / KORA mainly means detailed scientific work, which, however, resulted in spectacular success. "Several years ago it was found that arteriosclerosis is not only the deposition of plaques in the vascular system, but an inflammatory disease. This was a scientific breakthrough to which the GSF scientists from the KORA team made a big contribution," Löwel recalls. With its complexity the long-term observation of the MONICA/KORA test subjects provides a unique possibility to determine the new pro- or anti-inflammatory and genetic parameters considered to be relevant from frozen blood samples of the basic examination at short notice and to relate them to the diseases which have meanwhile occurred. The KORA studies are also increasingly included in international meta-analyses, which makes Germany as more visible a research site.



Another result of international relevance found by the scientists in the KORA Health Platform was that they confirmed that air pollution and arteriosclerosis and myocardial infarctions are connected. This result was met with extreme skepticism at first, but meanwhile it has become the basis for worldwide research activities. It was seen that during phases of strong air pollution – mainly with ultrafine and respirable particles – more myocardial infarctions occur. "The genes could also be of importance for this elevated risk," Löwel suspects. Therefore, in the ongoing AIRGENE Study on the complex "Air Pollution and Inflammatory Response", which is sponsored by the EU, particularly susceptible persons will be defined on the basis of genotyping in six big European cities. Thus, inflammation markers were determined regularly in the patients concerned and the times of the measurements were related to the air pollution values. This project is also coordinated at the GSF: Dr. Annette Peters, GSF Institute of Epidemiology, coordinates the international project.



Thus, scientists from many research institutes, clinics, universities and other institutions also participate in the KORA study with a look to assessing care structures and processes, providing scientific support for decision-makers and supporting health research in the fields of epidemiology and health economics. The successful cooperation is also facilitated by the great financial commitment of the GSF and further funds from the Federal government, the DFG, the EU and other international sponsors. The success of this research platform is seen not least in the numerous publications in top-class international journals.

In the frame of KORA, the cardiovascular MONICA research is ongoing. However, extended by a broader field of chronic diseases and sub-clinical outcomes, another 6000 citizens were randomly selected from the address file of the registration offices and invited to participate in the study, examined thoroughly and interviewed between 1999 and 2001. They gave information on habits, such as smoking, diet, alcohol consumption, sports activities, their occupational environ-

ment as well as chronic diseases. All blood samples, from which the scientists obtain numerous laboratory parameters, were frozen for future analyses, as had been the case since the beginning of the study. Thus, GSF scientists have meanwhile gathered data of about 18,000 people, who they want to continue to track with interviews and follow-up studies.

The more than 30 studies in the genome research network show that genetic research benefits greatly from the KORA data. In myocardial infarction research the specific combination of genetic parameters with more and more individual factors opens up the vision of formulations increasingly made to measure. "Today we do not want to make just general statements any more, we want to assess the risk of individuals to suffer a myocardial infarction and enable people who are at risk to identify and reduce their very personal risk," says Löwel.



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