



EFCOVAL CLOSING CONFERENCE

The closing conference of the EFCOVAL project [European Food Consumption and VALIDation] was held in Utrecht, the Netherlands on 9-10 September 2009. The aim of this event was to disseminate the main project results to a wide audience of policy makers, risk assessors and researchers in the field of nutrition monitoring surveys. About 80 participants from 21 European countries and 2 countries outside Europe attended the meeting.

In the first session on Wednesday 9th September 2009, the project coordinator (Dr E. de Boer, RIVM) presented the rationale, study aims and the outlines of the different work packages in the EFCOVAL project. EFCOVAL is devoted to the development and validation of a trans-European food consumption survey instrument, designed to evaluate the intake of foods and nutrients, and potentially hazardous chemicals in the European population. EFCOVAL continues the work of a former EU project (EFCOSUM) that recommended a detailed recording of all food intake of a person in a 24h period as the best method to obtain reliable and comparable data from European countries. The EPIC-Soft program was recommended to collect 24-hour recalls in European countries, although the need for additional developments and improvements of the software was recognized.

The second session on the same day was titled the upgrade and validity of the repeated 24hr recall method with EPIC-Soft. The session started with a comprehensive and informative introduction by Dr. A. Welch (UEA). She reviewed dietary measurement errors related to the 24-hour recall methodology and the use of (independent) biomarkers to quantify them. In general the 24-hr recall method seems to perform better as compared to more complex methods like the food frequency questionnaire. However, multiple 24-hr recalls are required to rank individuals in the case of episodically consumed foods and skewed nutrient distributions. Further validation, developments for calibration and statistical modelling is still required .

One of the main goals of the EFCOVAL project was to develop further, adapt and validate the EPIC-Soft program, according to specific needs of future possible pan-European monitoring surveys. Dr N. Slimani (IARC) addressed the improvements on EPIC-Soft in EFCOVAL such as the adaptation to Windows environment, the upgrade of the EPIC-Soft data structure and databases, conceptualisation, implementation and test of a series of new specifications to improve EPIC-Soft and adapt it for pan European monitoring surveys. A new EPIC-Soft release is expected at the end of 2009. Furthermore within EFCOVAL the concepts of a platform for the maintenance, setting and dissemination of EPIC-Soft (EPIC-Soft Methodological Platform) is being developed. However, the actual implementation and tests of the whole platform will be done after EFCOVAL, using other resources, with an expected completion by the end of 2010.

The final presentation on Wednesday 9th September 2009 showed preliminary results of the EFCOVAL validity studies that validated the computerized two-day 24 hr recall using EPIC-Soft for comparisons of nutrient and food intakes between five European countries, with the use of biomarkers. Mrs S. Crispim (WUR) showed that overall underestimation was found in the assessment of mean protein (range -2.1 to -14.2%) and potassium (range of -1 to -14.9%) intakes in most countries. For the ranking within and between countries the results in terms of the food groups were not conclusive and more work needs to be done on the interpretation. Moderate correlations were observed in the ranking of individuals within countries according to their protein intakes, and these seem to be comparable between countries. These results are in line with the literature. Although further analyses need to be conducted, the repeated 24hr recall method using EPIC-Soft appears to be suitable to describe the intake distributions of European populations, according to their protein, potassium, fish, fruit & vegetable intake.



Dr. E. de Boer



Dr. A. Welch



Dr. N. Slimani



Mrs. S. Crispim



On Thursday 10th September 2009, the programme continued with the session on statistical methods to calculate usual intake and uncertainty in food intake data. The first speaker was Dr K. Dodd (NIH/NCI) whose presentation was titled: modelling long-term intake using short-term measurements: a unified framework. The 24-h recall is a short term measurement providing information on food consumption of a single day. The interest centres often on long-term average, or "usual" intake, but obtaining many 24HRs is generally not practical. Several statistical models are available to estimate the population distribution of usual intake from at least two repeated measurements of short term intake measurements. All models have a common approach based on transformation of the data to the normal distribution: modelling of within and between person variation; shrinkage of the total variation to between person variation only; back transformation of the data to the original scale. However, substantial differences between the methods do exist. Methods for estimating distributions of usual intake from 24hr recalls have to take into account the within-individual variability in intake; skewed distributions of observed/usual nonzero intake and a large number of observed zero food intakes. Furthermore, the methods may also attempt to address the correlation between the probability to consume, the usual amount consumed and the relationships between intake and other covariates (individual-level or nuisance effects).

One of the statistical models for estimating the usual intake distributions; the Multiple Source Method (MSM) was developed within the EFCOVAL project. Dr H. Boeing and Dr U. Hartig (DIfE) presented the rationale of the method and gave a demonstration of the web-based interactive MSM program . With the MSM program the usual dietary intake can be calculated from 24h recall information and supporting data such as food frequency data. The method is characterized by a two-part shrinkage technique applied to residuals of two regression models. One regression model estimates the probability to consume a food on a given day and the other estimates the usual amount on a consumption day, after which both estimates are multiplied to obtain an estimate of usual intake for each individual in the study population. The method is applicable to nutrient and food intake including episodically consumed foods. A second objective was to compare four different recently developed methods to estimate the usual intake distributions (ISU, NCI, MSM and Spade) through a simulation study and application to the EFCOVAL validation study data. From this work it was concluded that the four different methods seem to provide reasonable estimates of the usual intake distribution of foods and nutrients. However, since the methods offer different

features, practical reasons may exist to prefer one method over the other.

Dr M. Feinberg (INRA) and Dr O. Souverein (WU) presented their findings with regard to the estimation of the uncertainty (term in field of Metrology) in food consumption data: examples of application to some sources of uncertainty. The procedure for estimating uncertainty can be divided into four steps. In the first step the quantity intended to be measured (e.g. Measurand) needs to be determined. The uncertainty sources are defined in the second step using the so-called fish-bone model. In the third step the model is simplified by grouping sources covered by existing data. The uncertainty associated with the various (grouped) sources are then quantified and subsequently expressed as standard deviations. In the final step (four) the combined standard and expanded uncertainty are calculated after which the large components need to be reviewed and re-evaluated. As an example the effect of portion size uncertainty on the estimation of the usual intake distribution using expert based estimates of uncertainty in aspects of portion size estimation was discussed by Dr O. Souverein.

In the fourth session expanding the applicability of the repeated 24hr recall method to food safety and children was discussed. In the first presentation Dr C. Leclercq (INRAN) discussed whether EPIC-Soft can contribute to the enhancement of dietary exposure assessments in the EU. Food consumption data at individual level with high level of details on food description is necessary to assess the dietary exposure to certain substances such as additives, flavourings and residues of food contact materials. In EFCOVAL the flavourings were chosen as relevant example for the adaptation of EPIC-Soft databases. Addition of descriptors to the specific flavouring facet seemed to give a better assessment of dietary exposure to flavourings. This is likely to be possible also for other food chemical categories. Furthermore, asking this information in the EPIC-Soft 24h recall was feasible. The main conclusion from this work was that EPIC-Soft software is fully appropriate for collection at individual level of food consumption data that will be used to perform dietary exposure assessment. If the 24 h dietary recall using EPIC-Soft software is chosen as the method to be used in future pan-European monitoring surveys, priority substances for which dietary exposure assessment is needed should be identified and the databases should be adapted accordingly. The latter recommendation was one of the statements in the planned panel discussion.



Dr. E. Trolle



The expert panel

The feasibility and validity of the suggested method for a trans-European dietary assessment method among school children was discussed by Dr E. Trolle (DTU). The aim of this part of the project was first to identify the most appropriate method(s) for dietary assessment in children (4-12 yrs). A workshop organised in 2007 focused on 24hr recall methods and food records. This meeting with several experts did not come up with one obvious method to choose. Based on the literature and conclusions of the workshop (including other experiences) the two following methods seem most appropriate among children. For preschoolers (4-6 yrs) a repeated 1 day food record and for school children (7-14 yrs) the repeated 24hr recall method together with a registration booklet (record of foods eaten out of home) were suggested. In a next step a feasibility study was carried out in two countries using the 2x 24h recall method with EPIC-Soft among school children aged 7-9 yrs and 12-14 yrs - and among preschoolers 4-6 yrs.

In addition, a relative validation/evaluation study including ActiReg accelerometers to objectively estimate energy expenditure was conducted within the feasibility study in Denmark. The first preliminary results revealed that information of the parents is needed for the children < 15 yrs to describe recipes and maybe foods. The registration booklet was perceived as positive by interviewers and interviewee. With regard to the comparison of recalls versus records differences in food group consumption and energy intake were found. These results have to be further analyzed.

The final session on Thursday 10th September 2009 addressed the lessons for the future from the EFCOVAL project. Dr M. Ocké (RIVM) summarized the conference presentations as well as the outcome of the workshop preceding the conference. Five experts with different scientific background were invited to discuss the implications of the EFCOVAL results in the near future. The panel members Mrs. T. Wijnhoven, WHO, Mr. D. Arcella, EFSA, Dr. P. Emmett, University of Bristol, UK, Prof. L. Moreno, University of Zaragoza, ES and Dr. K. Hulshof, NL were confronted with the following four provoking statements to be discussed with the audience.

First statement: 'The duplicate 24-hr recall using EPIC-Soft is sufficiently valid to assess (in)adequacy of the diet in national and comparative surveys in Europe'

Overall impression of the panel members and audience was that the method is sufficiently valid if used in combination with a food propensity questionnaire and the appropriate statistical tools to calculate the usual intake. The advantage to include a food frequency questionnaire is that it will give information on dietary consumption at individual level which is needed in epidemiological studies.

Statement 2: 'In the field of food safety, the duplicate 24-hr recall using EPIC-Soft can only be used to estimate dietary exposure if it is clear on beforehand what components are of interest'.

The overall impression was that the statement is not valid and too strong. In general researchers in the field of food safety are already quite comfortable with food consumption data collected with EPIC-Soft because of the level of detail and standardisation. Moreover, food consumption data, even not detailed, may always be used for rough exposure assessments, at the first steps of the evaluation.

Statement 3: 'EPIC-Soft software can be used for data entry and data acquisition in all population groups. However, the duplicate 24hr+FPQ are not appropriate for young children, elderly and "specific ethnic groups", and the instrument and databases need to be adapted for these groups'.

The overall impression was that the first part of statement 3 is too strong. At the moment the method seems most suitable in the adult population. However, most of the panel members and

the audience agreed in respect of the children and elderly with the second part of the statement. One of the arguments applying for a different method among (young) children is that in several countries children are in day care, where parents can not monitor their children's food consumption. In this case caretakers can be asked to record food consumption. The audience and panel members agreed that food records would be a better tool to assess the dietary intake in young children (1-3 yrs) than 24-hour recalls. One of the future plans is to adapt EPIC-Soft as data-entry system for food records.

With regard to the elderly it was discussed that the 24-hour recall could be problematic because of memory problems. For this group, it would be easier to record than to recall dietary intake. EPIC-Soft as data-entry system would also be very welcome in this case.

Statement 4: 'Provided that the method is sufficiently valid, what strategy could be recommended to implement the method to be used for a pan-European survey?'

From the panel members' point of view one of the priorities is standardization: provide clear protocols for training etc. to all participating countries. A next step could be a pilot test to evaluate the method, protocols etc in multiple countries. There was agreement that strong collaboration and good leadership are important for an effective implementation of a future pan-European dietary survey. Furthermore, the aspect of standardization should be controlled in every stage (before and after data collection) for comparable data. It was also discussed that not only data collection, but also sampling design procedures, type of interviewers, training etc. should be standardized. However, these aspects go beyond the EFCOVAL objectives.

The panel members and the audience agreed that it seems appropriate to start with a (pan)-European dietary survey among children as initiated in the recent EFSA call "pilot study in the view of a pan-European dietary survey among infants and children". It was agreed that if a pan-EU dietary survey would be initiated by EFSA it will be a long-term project (5-15 yrs), however the proposed time schedule needs to be realistic. As a proposed strategy it was suggested to start with a limited number of willing countries and then continue with other countries: the so called snowball effect. This strategy was positively received by EFSA.

With regard to the pan-European dietary survey the view point of WHO is different in respect to that of EFSA. The WHO does not have the intention to implement pan-European survey, but to provide guidance how to conduct a national survey that is comparable with other national surveys (standardization,

sampling, and training). According to the WHO it would be ideal to have a pan-European survey, but this seems not feasible in the short term. If a survey is needed, WHO recommended to start with countries that have no national survey at all. For countries that have already a survey it is possible to make adjustments on the data to enhance comparability.

According to the panel members the papers originating from the project may serve as a guide for the future. The proposed method for pan EU dietary survey should be reliable for measuring the dietary intake and not too expensive. Furthermore, the panel members believe that two more important things have to be developed before the implementation of a pan-European dietary survey e.g. the development of a food propensity questionnaire and the (further) development of an EU nutrient database. For the latter collaboration with the EuroFIR network will be important.

From all presentations and discussions three preliminary conclusions were presented to the panel members and audience.

- 1) The EFCOVAL study provides sufficient evidence to conclude that the repeated 24h dietary recall using EPIC-Soft for standardization in combination with a food propensity questionnaire, is suitable as an instrument for pan European surveillance of Nutritional Adequacy and Food Safety.
Main comments: At the moment this should be restricted to the adult population.
- 2) Given this methodology, an implementation plan is needed that accounts for
 - a. sampling designs that fit into/shape national surveillance programs
 - b. capacity building & training tailored to expertise available in countries
 - c. maintenance and update of EPIC-Soft databases and linkage to national food composition databases
- 3) Scientific debate on uncertainties in assessment, usual intake distribution, food composition tables, relevant biases and covariates, etc, should continue. This debate, however, cannot be used as an argument against implementation of pan European surveillance, but should be taken as a means to maintain and improve the quality of this objective.

Overall the panel members agreed with the above preliminary conclusions. In the coming months the project will be finalized and then final conclusions can be drawn.

The provided information reflects only the views of individuals as expressed during the different sessions and discussions during the EFCOVAL closing conference. The Community funding under the Sixth Framework Program for the EFCOVAL project is acknowledged (FOOD-CT-2006-022895). The Community, EFCOVAL consortium, speakers, panel members and participants at the EFCOVAL closing conference are not liable for any use that may be made of the information contained therein.

The Efcoval project is carried out with financial support from the European Community (contract FOOD-CT-2006-022895)

Contact for more information:
Dr Evelien de Boer,
Center for Nutrition and Health,
National Institute for Public Health and the Environment,
PO Box 1, 3720 Bilthoven, The Netherlands.
Email: Evelien.de.Boer@rivm.nl



NEWSLETTER Issue 4
January 2010 - Page 4