

The European Childhood Obesity Group (ECOG) project: the European collaborative study on the prevalence of obesity in children^{1,2}

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ABSTRACT During the European Congress on Obesity held in Barcelona in 1996, the European Childhood Obesity Group (ECOG) proposed a study designed to estimate the prevalence of obesity by country. An overview of existing systems revealed that most countries have no suitable structure in place for the determination of obesity in children and that the most practical sources of samples would be the school systems. A protocol was drawn up for these countries, whereas for those countries already collecting data, guidelines were defined to clarify the criteria allowing inclusion in the common analysis. The target population is 7–9-y-old children. The study design consists of separate cross-sectional population studies by country with a cluster probability sample of 2000 children attending primary school. The minimum common data will be age, weight, height, and hip, thigh, and waist circumferences. The participating countries will be encouraged to collect harmonized data on social indicators, lifestyle, diet, physical activity, and anthropometric measures of the parents. Children will be measured either by centrally based traveling examiners or, in countries with limited resources, by local staff. Each country will computerize its own data and send a copy to a center responsible for the common analysis. The main analysis will be of body mass index distribution in children from the different populations and determination of the proportion of children with a BMI above the 90th percentile of a common reference population. Members of the ECOG in 14 European countries have confirmed their interest in the project. *Am J Clin Nutr* 1999;70(suppl):166S–8S.

KEY WORDS Obesity, prevalence, children, Europe, body mass index, sampling methods, European Childhood Obesity Group

INTRODUCTION

Obesity in childhood is a public health problem of increasing importance in developed countries. However, a system for the precise estimation of the prevalence of this condition is not available in most European countries. The European Childhood Obesity Group (ECOG) aims to estimate the prevalence of obesity by country, in a way that would allow geographic (between countries) and chronologic comparisons. This article includes a short history of this project, a description of the updated version of the protocol, and the present status of the project.

SHORT HISTORY OF THE ECOG PROJECT

During the seventh European Congress on Obesity held in Barcelona on 14–17 May 1996, an informal meeting of ECOG took place. C Maffeis (personal communication) presented his proposal for a study designed to compare childhood obesity between European countries. I was then asked to coordinate the project. During the summer of 1996, a questionnaire was sent to all ECOG members to identify the countries that would be willing to take part in the project and to describe the systems designed to study weight and height distribution in children and possible sampling frameworks. Information was collected from 13 European countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Poland, Spain, Sweden, and the United Kingdom). Bulgaria joined the project later. Most countries have no formal system with which to study the weight and height distribution of children at regular intervals of time. The ECOG concluded that it would be most practical to draw samples from the school systems. A working group met in Paris on 5 November 1996 and submitted a common protocol for a prevalence study to the members participating in ECOG meeting in Ulm, Germany, on 5–7 December 1996. Meanwhile, for countries with existing data, ECOG members wrote guidelines clarifying on what conditions data could be used in a common analysis. This protocol was presented at the Ulm meeting and minor modifications were proposed. In March, 1997, an updated version of the protocol was sent to the members, together with a new protocol. One answer per country was requested. The members were invited to propose a reference team from their country composed of persons skilled in pediatrics and biostatistics. Moreover, the tasks required for a common study were described and the respondents were asked to specify the data collection methods and anticipated costs for their country. Only part of this information has been received to date.

SUMMARY OF THE PROTOCOL

Aims

The main objective is to estimate the prevalence of obesity in children by sex for each country, which will allow both compar-

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TABLE 1

Intentions of 8 responding European countries regarding the options of the European Childhood Obesity Group's proposed prevalence study

Country	Sampling method	Data collection method	Optional questionnaire
Austria	Procedure 1 ¹	Not decided	Yes
Bulgaria	Procedure 2 ²	Centralized team	Yes
Czech Republic	Procedure 2 ²	Local staff	Yes
Denmark	Procedure 2 ²	Centralized team	Yes
France	Procedure 1 ¹	Not decided	Yes
Poland	Procedure 2 ²	Local staff	Yes
Sweden	Procedure 2 ²	Local staff	Yes
United Kingdom	Use of existing data	—	No

¹Clusters are defined and randomly assigned on the basis of an existing list of schools that includes numbers of children per school by age and sex.

²A sample of schools is randomly selected and then the age-to-sex ratio is determined. Clusters will then be defined based on that sample and a subsample is selected.

isons between countries and surveillance of time trends within countries. When possible, general information on social conditions, diet, exercise, and lifestyle of the same children will be collected to identify risk groups and time trends for some of those characteristics known to be associated with a high risk of obesity.

Design and method

The target population in each country consists of 7–9-y-old children. This age group was chosen for both medical and practical reasons. At this age, the identification of obesity is of value to predict the condition in adulthood, and schooling is usually obligatory. Furthermore, this age range precedes puberty and eliminates possible differences between countries that could be attributed to variations in the age of puberty.

The proposed design consists of separate cross-sectional studies, by country, with probability samples of children attending primary school and a cluster sampling technique. Considering a limit for obesity that would define 10% of the population as obese, a simple random sample of 875 children would allow a 95% CI of $\pm 2\%$ (ie, between 8% and 12%). A moderate cluster effect is likely to happen. It was considered both realistic and acceptable to expect such an effect to increase the 95% CI by 1.5 at most, (ie, between 7% and 13%). On the other hand, stratification on a geographic basis is planned, which may increase precision. A sample size of 2000 children per country was adopted, which would provide ≈ 1000 children of each sex.

All countries have or can easily set up lists of schools available that can be used as sampling frames. However, the sizes of the schools may often be too variable to allow the schools themselves to be used as clusters. Therefore, such a list cannot be used directly for randomization. Few countries have data available on the number of children per school; therefore, 2 procedures were proposed. Procedure 1 is suitable for countries in which a detailed list of schools, with numbers of pupils by age and sex, is available. This would allow for the definition and random assignment of the clusters based on that list. Procedure 2 is proposed for countries that do not have such a detailed list. In this situation, a sample of schools will be selected at random and the age-to-sex structure of those schools will be determined. Clusters will then be defined on the basis of that sample, and a subsample will then be selected. Both procedures will result in cluster probability samples in which clusters will be groups of ≈ 30 children attending the same school. Stratification on a geographic basis is recommended.

Data collection

Among the measurements relevant to obesity, ECOG chose the most feasible ones to collect on a large scale: weight and height, for calculation of body mass index, and hip, thigh, and waist circumferences. Nursing or medical staff members will measure the children. Two alternative systems are proposed: 1) recruitment of a small number of centrally based traveling examiners and 2) use of local medical staff, especially in countries where medical teams operate in schools at the age considered and where resources are limited. In this case, detailed instructions on measurement techniques will be provided to ensure acceptable data quality.

Depending on the resources available, each country will decide whether to organize data collection on social indicators, lifestyle, weight, and height of the parents and on the dietary habits and physical activity of the children. In such cases the school authorities will convey a questionnaire to the parents before the intervention. The fieldworker will collect the completed questionnaires.

Data processing

The data will be computerized by country. Each country will send a copy to the statistics center (the Dunn Nutrition Center), which will be responsible for the common analysis. The main analysis, common to all the participant countries, will consist of estimation, by sex and country, of the BMI distribution and the proportion of children with a BMI above the 90th percentile of a common reference population. An attempt will be made to identify subpopulations, defined on geographic and social grounds, with high prevalences of obesity. Confounding factors, such as season, will be accounted for. Dietary intake, exercise, and lifestyle indicators will also be analyzed, concentrating on possible disparities between countries. An attempt will be made to evaluate to what extent those disparities, if any, can account for differences in the prevalence of obesity. This analysis may lead to new hypotheses on the determinants of obesity within those populations. Apart from this common analysis, each local team will be free to develop local procedures, for instance to study prevalence disparities within their country or organize a follow-up of the sample selected.

Existing data

It was proposed that existing data would be included in the analysis if they were nationally representative samples of adequate sample size (1000 minimum for both sexes); were obtained within the past 2 y; and included high-quality measurements of



sex, age, height, and weight (and hip, thigh, and waist circumferences and other measurements, if available). Additionally, these high-quality measures had to have been checked at regular intervals with the same criteria used in the surveys.

Supervision

ECOG, represented by its president, W Burniat, will be responsible for the overall supervision of the study. An international group, including pediatricians, obesity specialists, and epidemiologists, will be responsible for the coordination of the studies between countries. At a national level, a team with medical and statistical expertise will be in charge of the study in each country. Local informed consent will be obtained.

Prospects

The same study, repeated at 5-y intervals, would constitute a surveillance system to examine secular trends. This same design,

possibly after modification, could be used when representative data on health are to be collected on prepubertal children in European countries.

Current status

On the basis of the updated protocol, 8 countries have given some indications on how they intend to proceed (**Table 1**). Estimates of the cost of the study per country have been provided by 5 countries; the estimates are not presented because they need to be harmonized.

CONCLUSION

ECOG is now finalizing a detailed protocol that would be flexible enough to allow for large participation of European countries. Funding will be their main preoccupation. 

