

Inequalities in the prevalence of smoking in the European Union: comparing education and income

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Abstract

Background. The aim of the study was to determine whether education or income was more strongly related to smoking in the European Union at large, and within the individual countries of the EU, at the end of the 1990s.

Methods. We related smoking prevalence to education and income level by analyzing cross-sectional data on a total of 48,694 men and 52,618 women aged 16 and over from 11 countries of the European Union in 1998.

Results. Both education and income were related to smoking within the European Union at large. After adjustment of the other socioeconomic indicator, education remained related to smoking in the EU at large, but income only remained so among men. Educational inequalities were larger than income-related inequalities among younger and middle-aged men and women. Educational inequalities were larger than income-related inequalities among men in all individual countries, and among women in Northern Europe. For women from Southern European countries, the magnitude of education- and income-related inequalities was similar.

Conclusions. Education is a strong predictor of smoking in Europe. Interventions should aim to prevent addiction to smoking among the lower educated, by price policies, school-based programs, and smoking cessation support for young adults.

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Introduction

Several studies have demonstrated that the prevalence of smoking in populations of developed countries is related to socioeconomic status [1–6]. Smoking is an important risk factor for some diseases and causes of death and it has been shown that a substantial part of socioeconomic inequalities in morbidity and mortality can be linked to smoking [7–9]. Studies that describe socioeconomic inequalities in smoking therefore contribute to an understanding of the determinants of smoking and, indirectly, to determinants of health inequalities. Furthermore, they serve to identify the subgroups of the population who need most attention in policies aiming to reduce smoking.

In most research in European countries, socioeconomic inequalities in smoking have been described according to level of education. Smoking is often initiated during adolescence, a time in which school environment plays an important role in daily life. School performance [10,11] and peer pressure [12–14] are related to smoking initiation, and are likely to be related to lower educational level. However, after leaving school and moving into the workforce, other socioeconomic determinants, such as income, may have a stronger influence on smoking initiation and continuation. After completion of education, its stability in life thereafter fails to reflect changes in personal circumstances that may be relevant to the initiation and continuation of smoking behavior. Income is an indicator that more accurately than education reflects an adult's current social position. Some researchers have indeed shown that income is also related to health behaviors, including smoking, after adjustment for education [15–17], although it has also been reported otherwise [18]. Nevertheless, to our knowledge, a direct

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comparison of educational and income inequalities in smoking has not been reported.

The effects of education and income on smoking can be expected to differ between countries because the diffusion of smoking within the national population differs between European countries [3,4]. Toward the later stages of the diffusion of the smoking epidemic, when the overall prevalence of smoking is declining, smoking is more and more associated with lower socioeconomic status [1,3,19]. At these stages, smoking as a habit may perhaps be more related to material circumstances and deprivation. Smoking in Britain for instance is concentrated in the lower income groups [20] and smoking serves to cope with the stress of living in disadvantaged circumstances [21]. In the earlier stages of the epidemic, as smoking is not as widespread in the population, smoking may be more strongly related to education, and smoking as a habit may signal innovation and emancipation among higher educated men and women. This means that results of studies on data from the US, or Northern European countries may not be generalized to express the situation in central and southern parts of Europe.

The aim of this study is to compare educational and income inequalities in smoking in the European Union, including countries from northern, central and southern parts of Europe, at the end of the 1990s. We compare these inequalities for the pooled population of 11 countries of the European Union, and for each of these countries separately. Our specific interest was in determining whether education or income was more strongly related to smoking, and to assess whether each has an independent effect.

Data and methods

Data from the fifth wave (1998) of the European Community Household Survey (ECHP) were analyzed. The ECHP is a social survey designed for the member states of the European Union, which uses a uniform random sampling design and common blueprint questionnaires for use in all the countries included. For all countries, the target population of the panel survey is the national household population. Data are collected by national statistical institutes or research centers. Data checks, imputation, and weighing are performed centrally by the Statistical Office of the European Community (Eurostat) to maximize the quality of the data before these are made available to researchers. In all countries, a common design of the survey and questionnaires are used. The survey data collected in 1998 were used in the current study because this was the first year that questions on smoking were included in the ECHP survey. Countries for which information on smoking was not included during the fifth wave were omitted from the study. These countries were: France, Luxembourg and The Netherlands. Table 1 gives information on the sample sizes of the countries included in the study.

Basic information on response rates and attrition is given in Table 2. This table gives the household response percentages of the first wave of the survey and of the percentage of persons lost to follow-up until the fifth wave. There are large differences between countries in the response rates at the start of the survey (wave 1). Some of those countries with the lower response rates also had higher attrition over the subsequent follow-up periods. Specifically, the samples of Denmark, Ireland, and Spain suffered high attrition percentages. Analyses have been performed on attrition in the ECHP, which showed that attrition was only weakly related to educational level [22]. Differences between countries were observed in the association of attrition with educational level. Ireland, Italy, Greece, Spain, Austria, and Portugal tended to lose disproportionately participants with a higher level of education, while Germany, Denmark, Belgium, and the United Kingdom tended to lose more participants with lower education during follow-up. These issues are also commented upon in the discussion section.

We used two indicators of socioeconomic status: level of education and net household income. Subjects were divided into three groups according to their level of educational attainment based on the International Standard Classification of Education (ISCED) [23]: (1) lower secondary education or lower; (2) upper secondary education; and (3) tertiary education, which is constituted by vocational and university education.

Net household income includes all income sources of every person in the household and any income that is received by the household as a whole. The total net household income is calculated from a detailed set of income data, which includes data from self-employment, wage, and salary earnings, but also income that is non-work-related, such as old age benefits, income from capital, unemployment benefits, and education-related allowances. We corrected the total net household income for the number of persons in the household by dividing it by the square root of the number of persons in the household. Subsequently, quintile groups were identified according to income, each representing 20% of the age-specific income range. The lowest quintile represented those with the lowest incomes.

Subjects were asked whether they smoked daily, smoked occasionally, used to smoke daily, used to smoke occasionally, or never smoked. In this study, we defined those who indicated that they smoked daily at the time of the survey as being a smoker. No distinction was made between smoking cigarettes, pipe, and cigars in the current study.

Analyses were first performed on the data of all the countries combined. We distinguished between 10-year age groups (16 to 24 years, 25 to 34 years, 35 to 44 years. . . , and 75 years and over). Secondly, analyses were performed for the individual countries. We only determined the inequalities for the ages 25–59 years for the separate countries because these are the ages at which smoking has most often

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