Educational Inequalities in Cervical Cancer Screening in Europe

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Introduction

In recent years, cancer has been one of the leading causes of death across (not only) European countries, which means that early diagnosis becomes an important issue. This seems to be especially important for some specific cancer sites, including cervical cancer. Multiple studies show the importance of cancer screening and its effect on lowering cancer-related death rates (Peto et al., 2004; Lönnberg et al., 2012; Vicus et al., 2014; Kamineni et al., 2013). For example, a study by Landy et al. (2016) estimated that cervical cancer screening prevents about 70% of cervical cancer deaths, but if all women attended screening regularly, 83% of deaths from cervical cancer could be prevented. A recent systematic review of the effects of organised screening on cervical cancer mortality in Europe has been conducted. It showed a range of mortality reduction in attendees versus non-attendee from 41% to 92% (Jansen et al., 2020).

According to Globocan (Ferlay et al., 2021) the age-standardized incidence rate was 15.0 cases per 100,000 women in Europe in 2020 and they estimate about 26,000 deaths in Europe were due to cervical cancer.

The European Council recommendation of the 2nd of December 2003 on cancer screening (2003/878/EC) implies that all European Union (EU) member states should implement population-based cancer screening programmes, including cervical cancer screening. Specifically, the use of PAP smear tests is recommended, starting at age 20–30 in 3–5 years intervals until 60 or 65 years of age (Arbyn et al., 2008).
There is some evidence on how education affects cancer screening attendance. Educational gradients were observed, for example by Willems and Bracke (2018), however literature on this topic is still lacking, especially for multiple countries or the whole European region. Therefore, the aim of this paper is to analyze the differences in cancer screening attendance among European countries with a special emphasis on educational inequalities in attendance and differences in these inequalities around Europe.

Data and methods

As a main source for the analysis, we use the data from the European Health Information Survey 2014 (EHIS). The survey data include information about sex, age by 5-year groups, various SES information, etc. Firstly, we use this data to calculate the standardized attendance rates in cervical cancer screening by country – for the whole population and by educational level (low, medium and high levels are provided). Secondly, we apply binary logistic regression to estimate the chances of nonattendance to screening by educational level, separately for each country. Finally, we will apply the multilevel approach to quantify the effect of individual and country level. In the analysis, women aged 30–64 were included and those with complete information on cancer screening participation and education were included (n = 94,151). Following the EU guidelines, women who have attended screening in the last three years were considered attenders.

Preliminary results

The preliminary results show that there are large differences in attendance between countries. Both overall attendance and attendance by educational level are shown in Figure 1. The highest attendance by country was reported in Czechia, Sweden, and Austria.

After applying the binary logistic regression (Figure 2) it is possible to see that there are significant differences in the chances not-to attend the screening between the countries. Low and medium educational levels were compared to the high educational level. In most of the European countries women with low educational attainment have significantly higher chances not to attend the cervical cancer screening compared to high educational level (p<0.05). When comparing medium educational level to high level, women from
about half of the countries have significantly higher chances not to attend the screening. Those differences also vary by country.

Figure 1: Standardized cervical cancer attendance rates by country and educational level, female population, EHIS 2014

Figure 2: Chances of cervical cancer screening non-attendance, educational levels compared to “high” level of education, EHIS 2014
Conclusion

We found out that there are differences in cervical cancer screening attendance among European countries. The attendance to screening varies from about 30% in Romania to almost 90% in Czechia. These differences might be due to differences in cancer screening programmes’ organization among countries and also different health care systems’ organization in Europe. However, there is a clear impact of educational attainment on cancer screening attendance. Those inequalities should be of high interest to the research community, especially to demographers, epidemiologists, and public health specialists as it may, in long-term, have an impact on inequalities in cervical cancer mortality.

References


**Data availability**

This paper is based on data from Eurostat, EHIS, 2014. The responsibility for all conclusions drawn from the data lies entirely with the author(s).