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Participants, Physicians or Programmes: Participants' educational level and initiative in cancer screening

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ABSTRACT

This study is an in-depth examination of at whose initiative (participant, physician or screening programme) individuals participate in cervical, breast and colorectal cancer screening across the EU-28. Special attention is paid to (1) the association with educational attainment and (2) the country's cancer screening strategy (organised, pilot/regional or opportunistic) for each type of cancer screened. Data were obtained from Eurobarometer 66.2 'Health in the European Union' (2006). Final samples consisted of 10,186; 5443 and 9851 individuals for cervical, breast, and colorectal cancer, respectively. Multinomial logistic regressions were performed. Surprisingly, even in countries with organised screening programmes, participation in screenings for cervical, breast and colorectal cancer was most likely to be initiated by the general practitioner (GP) or the participant. In general, GPs were found to play a crucial role in making referrals to screenings, regardless of the country's screening strategy. The results also revealed differences between educational groups with regard to their incentive to participate in cervical and breast cancer screening and, to a lesser extent, in colorectal cancer screening. People with high education are more likely to participate in cancer screening at their own initiative, while people with less education are more likely to participate at the initiative of a physician or a screening programme. Albeit, the results varied according to type of cancer screening and national screening strategy.

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1. Introduction

Each year, cancer is diagnosed in around 3.2 million Europeans. In addition to being a major cause of suffering and death, it is thus also a priority of health policy in the European Union [1,2]. Deaths from cervical, breast or colorectal cancer comprise a substantial proportion of all cancer deaths in the EU [1]. In 2003, the European Council strongly advocated the development and implementation of national screening programmes for cervical, breast and colorectal cancer in all EU Member States [3]. This was motivated by the fact that early detection through systematic evidence-based cancer screening enhances the possibility of treating these cancers appropriately in an early stage, thereby greatly increasing the likelihood of cure [4] while reducing the rate of morbidity and mortality [3,5,6]. In addition to being beneficial for the individuals concerned, cancer screening is beneficial to society as a whole, as it can minimise the economic and social burden of cancer [1].

Despite these advantages, participation in cancer screenings is affected by many factors at the individual level (e.g. education,

income, occupation, ethnicity, gender, marital status, social support, age, psychosocial factors), as well as at the contextual level (e.g. screening strategies, health-system characteristics, and invitation factors) [7,8]. At the individual level, especially educational attainment is a crucial predictor of participation in cancer screenings. Compared to those with less education, people with higher levels of education are more likely to participate in screenings for cervical, breast and colorectal cancer [7,9–14]. At the contextual level, the cancer screening strategy (e.g. organised or opportunistic) applied in a given country is being increasingly recognised as an important factor in cancer screening participation [1,10,11,15–18]. In organised cancer screening, asymptomatic individuals within a given age range and sex (i.e. the target at-risk population) are systematically identified and invited to participate in a population-based programme, which is characterised by universal coverage and a quality-assurance structure [10,19]. In contrast, opportunistic cancer screening involves offering screening tests through the primary healthcare system or in other healthcare settings [20]. Opportunistic strategies thus make participation dependent on the initiative of the individual or the treating physician. As stated by the European Council Recommendation, [3] and as established by previous research [10,11,17,18,20], organised screening programmes

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are better equipped to reduce social inequalities in participation, in addition to being more cost-effective and efficient.

Although previous studies have identified the cancer screening strategies used in European countries for each type of cancer screened and specified how these strategies affect participation rates (including in terms of educational attainment [1,19,21–23]), little is known about the parties instigating participation in cancer screening and whether this varies across countries according to their screening strategies. More specifically, existing studies have not specified whether the observed participation in cancer screening was at the initiative of the participant, a physician or a screening programme. It is therefore unclear whether the elevated participation rates usually observed in countries with organised cancer screening programmes [11,16] are actually due to increases in participation resulting from these programmes, or whether they reflect increases in participation at the initiative of participants or physicians. In addition, while previous studies have provided evidence of differences in participation according to educational attainment, none of these studies has investigated possible differences between educational groups with regard to their incentive to participate. The central aim of this study is therefore to investigate at whose initiative (e.g. participant, physician or screening programme) individuals participate in cervical, breast and colorectal cancer screening across all EU-28 countries. Special attention is directed towards national cancer screening strategies for each type of cancer screened and differences amongst educational groups with regard to the initiative to participate in cancer screening.

When comparing the parties who might take the initiative in cancer screening participation (e.g. participant, physician and programme), participation at the individual's initiative can be treated as an independent decision, while participation at the initiative of a physician or programme could be regarded as a shared or influenced decision. In turn, differences in the participant's share in the screening decision might be associated with differences in educational attainment. Previous studies have indicated that people with higher levels of education tend to have better decision-making abilities and greater engagement in risk-control behaviours, while people with lower levels of education tend to have more fatalistic beliefs about cancer [24]. In addition to implicating the decision-making of people with lower levels of education with regard to cancer screenings, this also reduces the likelihood that they will take the initiative themselves to use opportunities for early detection [25–27]. We therefore expect people with higher levels of education to be more likely to decide to participate in cancer screening, as compared to people with less education, independent of advice from a physician or invitation from a screening programme.

H1. People with higher levels of education are more likely to participate in cancer screening at their own initiative than are those with less education.

On the other hand, when cancer screening is encouraged by third parties (e.g. physicians or screening programmes), people with lower levels of education might be more likely to be persuaded to participate. Mounting evidence suggests that recommendations from family physicians can considerably increase the likelihood of engaging in cancer screening [28–32]. In addition, previous studies have established that people with lower levels of education tend to have more frequent contact with their general practitioners (GP) than do those with more education, even if their less favourable health status is taken into account [33]. In addition to the treating physician, evidence is increasingly supporting the proposition that organised screening programmes might also narrow the educational gap in cancer screening participation [10,11,17,18,20]. Both financial and non-financial barriers (e.g. the burden of arranging screening) are greater when there is no screening programme (i.e.

within the context of opportunistic screening), as responsibility for overcoming these barriers falls solely on the individual [10]. We therefore expect that people with lower levels of education are more likely to decide to participate in cancer screening if this decision is guided by a third party, particularly if they are guided by the treating physician or an invitation from a screening programme.

H2. People with lower levels of education are more likely to participate in cancer screening at the initiative of a physician or screening programme than they are to participate at their own initiative

To the best of our knowledge, ours is the first study to conduct an in-depth exploration of the initiative for the decision to participate in cancer screening and its association with educational attainment across screenings for different types of cancer, across cancer screening strategies and across European countries.

2. Materials and methods

2.1. Dataset

Data were obtained from a large population-based survey: Eurobarometer 66.2, *Health in the European Union* [dataset] [34]. In the current study, final sample sizes correspond to the country-specific target population for each type of cancer screened, given the wide variations that continue to exist across the EU-28, [3] despite the guidelines of the European Commission concerning the appropriate target population (women between 25 and 64 years of age for cervical cancer, women between 50 and 69 years for breast cancer, and men and women from 50 to 74 years old for colorectal cancer). In absence of country-specific information on the target population, we adopted the European guideline for that country. Data concerning the countries' target populations and screening strategies for cervical, breast and colorectal cancer in 2006 were obtained from studies by Altobelli and Lattanzi [21], Altobelli and colleagues [21], Anttila and colleagues [23], Bastos and colleagues [19], Karsa and colleagues [1] and the International Agency for Research on Cancer (IARC) [35]. We considered a country's cancer screening strategy opportunistic if there was no formal programme in 2006 and organised if there was a population-based programme in 2006. Countries with pilot programmes or regional programmes in 2006 were merged into the category 'pilot/regional'. The final sample sizes were as follows: 10,186 women for cervical cancer screening, 5443 women for breast cancer screening and 9851 men and women for colorectal cancer screening, after excluding cases with missing information (182 [1.8%], 93 [1.7%], and 209 [2.1%], respectively) and the individuals who had been diagnosed with cancer at the time of the interview (1035 [3.8%]).

2.2. Variables

The three dependent variables were participation in screening for cervical, breast and colorectal cancer. Respondents were asked whether they had participated in a cervical smear test, a mammography or a colorectal cancer test in the preceding 12 months. The available answers were 'Yes, at my own initiative', 'Yes, at a doctor's initiative', 'Yes, through a screening programme' and 'No'. Educational attainment was determined by the age at which respondents had completed full-time education. For the current study, this variable was categorised into the following categories, which roughly correspond to primary, secondary and tertiary education [36]: (1) 'Completed education at 15 years of age or younger' (2) 'Completed education between 16 and 19 years of age' (3) 'Completed education at 20 years of age or older'. There was accounted for age, gender (0 = male, 1 = female), work status (0 = employed, 1 = unemployed, 2 = non-employed [retired and house persons]), marital status (0 = no partner, 1 = partner) and self-reported health

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