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Social inequality and incidence of and survival from cancer of the female genital organs in a population-based study in Denmark, 1994–2003

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ABSTRACT

We investigated the effects of socioeconomic, demographic and health-related indicators on the incidence of and survival from cancers of the cervix, endometrium and ovary diagnosed in 1994–2003 with follow-up through 2006 in Denmark using information from nationwide registers. The analyses were based on the data on 3007 patients with cervical cancer, 3826 with endometrial cancer and 3855 with ovarian cancer in a cohort of 3.22 million persons born between 1925 and 1973 and aged ≥ 30 years. The incidence of cervical cancer increased with decreasing socioeconomic position; the incidences of endometrial and ovarian cancer were mostly associated with higher disposable income. Relative survival from cervical cancer was the highest among women of high socioeconomic position; increased excess mortality rates from endometrial and ovarian cancer were associated with low educational level, mainly during the first year after diagnosis. Socioeconomic position seemed to affect both the incidence of and the survival from cancers of the female genital organs.

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1. Introduction

In Denmark, the incidence of and mortality from cervical cancer have decreased since the 1960s, those of endometrial cancer since the early 1980s and those of ovarian cancer since the early 1970s.^{1–3} Altogether, one of these cancers was diagnosed in nearly 1600 Danish women in 2003, and in 2001 more than 700 died.³ Endometrial cancer is the commonest of the three cancers of the female genital organs, with, in 2003, 633 cases, as compared with 549 cases of ovarian cancer and 408 of cervical cancer. Ovarian cancer is the most lethal gynaecological cancer, accounting for 447 deaths, whereas cervical cancer

caused 148 deaths and endometrial cancer caused 123 deaths in 2001.³

A meta-analysis of social inequality in cervical cancer showed an odds ratio of 1.97 (95% CI, 1.80–2.15) for cervical cancer among women of low socioeconomic position when compared with women of high socioeconomic position.⁴ This social disparity is often explained by differences in sexual habits, infection with human papillomavirus (HPV)⁵ and compliance with screening.⁶ Survival from cervical cancer is also the poorest mainly in groups of low socioeconomic position.⁷ Relatively few studies have addressed associations between socioeconomic position and the risks for endometrial and

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ovarian cancer, and the results have been inconsistent,^{8,9} however, mortality from these two cancers has been found relatively consistently to be the highest in women of low socioeconomic position.⁷

The aim of this register-based study was to assess whether socioeconomic position plays a role in the incidence of and survival from cervical cancer, ovarian cancer and endometrial cancer in Denmark, as part of a comprehensive, rigorous analysis of the role of socioeconomic status in cancer incidence and survival.

2. Materials and methods

The material and methods are described elsewhere.¹⁰ Briefly, the study population comprised all 3.22 Danish residents (1.59 million women) born between 1925 and 1973 without a previous incidence of cancer and who entered the cohort at age 30 (see Fig. 1 in ¹⁰). Information on socioeconomic, demographic and health-related indicators was obtained from various Danish registers based on administrative data.¹⁰ Crude, age-specific and age-standardised incidence rates are presented for cervical cancer (ICD-10 C53), endometrial cancer (ICD-10 C54) and ovarian cancer (ICD-10 C56, C57.0–4) diagnosed in the cohort in 1994–2003. The incidence rates were standardised by age (in 5-year age groups) and period (in two 5-year periods), with the total study population as the standard.¹¹ Further, we used log-linear Poisson regression to model incidence rate ratios (IRRs), first adjusted for period (in 5-year periods) and age (as two continuous variables: age and age² in years) and secondly by adding education and disposable income to the models. For each level of each indicator, we conducted relative survival analyses, adjusting for population mortality among the incident cancer cases in 1994–2003 with follow-up through 2006.¹⁰ Population mortality rates were stratified by age, period and the respective indicator. Except for the analyses of ethnicity, all analyses included only residents born in Denmark to at least one Danish-born parent with Danish citizenship.¹⁰

3. Results

3.1. Cervical cancer

The study population consisted of 3007 women born in 1924–1974 in whom cervical cancer was diagnosed during 1994–2003. These represented 70% of all cervical cancers in that period. Among Danish women, the age- and period-standardised incidence rate was 23 per 100,000 women-years.

3.2. Incidence of cervical cancer

The age- and period-standardised incidence rate for cervical cancer decreased with increasing education. The incidence rate difference between women with basic schooling and higher education was 8 per 100,000 person-years, and the incidence rate difference between those with vocational and higher education was 3 per 100,000 person-years (Fig. 1).

The IRRs for cervical cancer according to socioeconomic, demographic and health-related variables are shown in

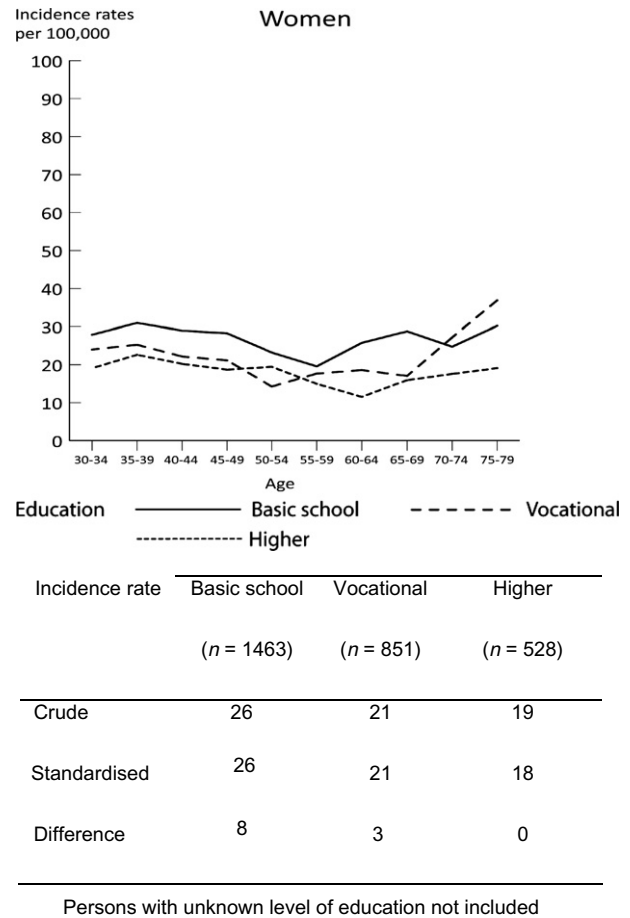


Fig. 1 – Age-specific incidence rates per 100,000 person-years for cervical cancer by education among persons born in 1925–1973, Denmark, 1994–2003. Supplementary table shows the crude incidence rate and the incidence rate standardised by age (5-year age groups) and period (two 5-year periods) with the total study population as the standard and the incidence rate difference with higher education as the reference.

Table 1. The IRRs, adjusted for age, period, education and income, increased with decreasing level of education, disposable income, affiliation to the work market, housing tenure and size of dwelling and decreased with decreasing urbanity. In comparison with married women, all other groups had higher IRRs for cervical cancer, the difference being most pronounced for divorced women. The social class variable showed no clear pattern in relation to cervical cancer; however, women in the agricultural class had a lower IRR of cervical cancer than women in the manual class. Based on small numbers immigrants and descendants from non-western countries had a lower IRR than Danish women, whereas a diagnosis of schizophrenia or other psychoses increased the IRR.

3.3. Relative survival from cervical cancer

For patients with cervical cancer diagnosed in 1994–2003, the 1-year relative survival was 89% and the 5-year relative survival was 71%.

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