Background

According to the "fundamental cause theory", emerging knowledge on health-enhancing behaviours and new medical interventions result in persisting and even widening health disparities [1,2]. Those with better access to resources such as knowledge, money, and a strong and beneficial social network, are more likely to use the benefits of these developments to their health advantage [1,3]. Similarly, in recent decades, the knowledge on prevention and treatment of cancer has improved substantially, likely resulting in (widening) disparities.

Study aims and hypotheses

Therefore, the first aim of this study is to unravel educational inequalities in site-specific cancer mortality in Belgian women in the 2000s. Based on the fundamental cause theory, we assume that we will observe educational inequalities in favour of high-educated women for several cancer sites, and that these inequalities will be more expressed for the cancers with well-known risk factors and/or available treatments. Secondly, we want to gain insight in the evolution of educational inequalities in female cancer mortality between the 1990s and the 2000s. We assume that we will observe increasing educational inequalities for the preventable and treatable cancer sites.

Data and methods

Data were derived from record linkage between the Belgian censuses of 1991 and 2001 and register data on mortality and emigration for the follow-up periods 01/03/1991-31/12/1997 and 01/10/2001-31/07/2008. In a first stage, a link was established between the censuses and the register data concerning all deaths and emigrations during the respective observation periods. In a second stage, cause-specific mortality data have been added using anonymous individual linkage with death certificates. The database is a unique source of information containing data on mortality, emigration, causes of death, and background characteristics of all individuals legally residing in Belgium at the time of the 1991 and 2001 census. The study population comprised all Belgian female inhabitants aged between 50 to 79 years during the follow-up period.

All cancer sites representing at least one per cent of total cancer mortality (i.e. more than 1,000 cases) in one of both periods were included in the analyses. The cancer sites were defined following the International Classification of Diseases and Related Health Problems (ICD-9 for the 1990s and ICD-10 for the 2000s). Cancer sites were considered as preventable when the combined population-attributable fraction of mortality due to risk factors such as smoking and alcohol abuse was larger than 50% (e.g. lung cancer), or when the 5-year relative survival rate for Belgian women was larger than 70% (e.g. breast cancer). As measure of socioeconomic position, we used educational attainment, categorized according to the International Standard Classification of Education (ISCED), version 1997: lower secondary education or less (ISCED 0-2; "low"), higher secondary education (ISCED 3-4; "mid"), and tertiary education (ISCED 5-6; "high").

To obtain the full picture of inequality patterns in cancer mortality, both absolute and relative inequality measures were calculated. To gain insight in absolute inequalities, we calculated age-standardized mortality rates (ASMR) by period and educational level, directly standardized to the total Belgian female population in 2001. Furthermore we calculated the difference between the ASMR of low- and high-educated women; the population-attributable fractions of education for mortality; as well as the absolute and proportional mortality decline between the two periods. To calculate relative inequalities, mortality rate ratios (MRRs) were calculated using Poisson regression, adjusted for attained age, region, migrant background and parity. To assess the trend over time and to account for the different educational distribution in both periods, we also calculated the Relative Index of Inequalities.

Results

The results indicate that in the 2000s, from the preventable cancer sites, cancers of the lung, colorectum and stomach are the sites with the highest absolute inequalities. Yet, relative inequalities are much more pronounced. Total cancer mortality as well as the majority of the (preventable) cancer sites show relative inequalities in favour of high-educated women. The largest relative inequalities are observed for stomach, lung, and cervical cancers with MRRs for low-educated women that are respectively 1.9 (95% CI: 1.5-2.5), 1.7 (95% CI: 1.6-1.9), and 1.6 (95% CI: 1.2-2.2) times higher compared with high-educated women. Inequalities are increasing over time for cancers of the head and neck, colorectum, liver, and breast, which are all associated with behavioural risk factors and/or medical interventions.

Conclusions

In general, the preliminary results seem to confirm our first hypothesis. Indeed, we observed persisting educational differences for the majority of cancer sites, and among them the largest relative inequalities were observed for the preventable cancer sites. In contrast, the preliminary results on the trends over time do not confirm the second hypothesis we made.
In any way, reducing social inequalities should remain high on the agenda of a good public health policy. Yet, at the same time we must bear in mind that public health policies aiming at the general population might also entail persisting or even increasing health inequalities [4]. Finally, researchers need to think about the potential role of unidentified risk factors and pathways linking SEP to cancer mortality [5,6].

References

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