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TIME TRENDS IN CANCER MORTALITY IN THE FEDERAL REPUBLIC OF GERMANY: PROGRESS AGAINST CANCER?

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In accordance with a previous analysis of US cancer mortality, this report also indicates that cancer mortality in the FRG over the last 3 decades (1952–1985) has not shown any decline commencing in a given period and prevailing in all age groups. If present, such effects could have been interpreted as a manifestation of improvements associated with cancer treatment. The absence of such an effect, derived by using data up to 1985 and age-specific mortality rates, supports the view expressed in the US analysis that improvements in cancer treatment are unlikely to have an impact on overall cancer mortality statistics and that efforts toward prevention may be more rewarding.

Bailar and Smith (1986) have examined trends in cancer mortality rates in the USA in order to assess whether improvements in cancer treatment may have resulted in corresponding changes in cancer mortality. Their overall result, namely that no such effects could be identified, have generated intensive discussions concerning the data and methods used in their report, as well as their conclusions. Four major objections were made: (1) the observed time period (1950–1982) was too short to detect effects of treatments which had been mainly introduced after 1975; (2) age-adjusted mortality rates are inappropriate for detecting the effects looked for whereas age-specific mortality rates would be more likely to show a pronounced decline; (3) successes in childhood cancer treatment are insufficiently recognized; and (4) even if the findings were correct, the conclusion that efforts should be shifted from research on cancer treatment to research on prevention may be considered unjustified. That report and the discussions which followed its publication illustrate the immediate interest of the scientific community as well as of the general public in the question raised, which indeed touches a major preoccupation concerning funding of cancer research.

The general importance of this question calls for further investigations. We have therefore performed a comparable investigation using data on cancer mortality in the FRG. An additional reason for our investigation was the apparent lack of data on cancer mortality in the FRG that is available to international readership. Data concerning the years 1952–1985 are available for the FRG population, and we used these, thus avoiding objection (1) mentioned above concerning the inadequacy of the time period examined by Bailar and Smith (1986). As far as objection (2) is concerned, we have considered age-specific mortality rates as well as age-adjusted mortality rates. Regarding objection (3), the rate of success in childhood cancer therapy will be recognized in the "Discussion". In addition, the age-adjusted mortality rates do not exclude the very young, but more emphasis should be laid on age groups in which cancers are most likely to occur and concerning which most public funds are spent for diagnosis and treatment. Objection (4) will also be dealt with in the "Discussion".

MATERIAL AND METHODS

In developed countries, mortality data represent the most complete and consistently collected information about the population's health and disease status. In the FRG, national cancer mortality data are derived from death certificates submitted to the local health offices. The validity of the certified cause of death is considered to be high for malignant diseases (Frentzel-Beyme *et al.*, 1980). Major changes in coding cause of death information during the 34-year time period that we have studied include 3 revisions of the International Classification of Diseases (ICD) system as well as improvements in medical techniques regarding *ante-mortem* diagnosis.

The FRG statistics for causes of death for the period 1952–1985 (originally collected by the Federal Office of Statistics) were obtained from the World Health Organization in Geneva. They are produced primarily as a condensed A and B list according to the ICD. Data on certain forms of cancer are thus not available separately. In our analysis, cancers of the small intestine (ICD 152) are considered together with those of the colon (ICD 153) since separate figures were not available until 1968. Mortality figures for cancer of the small intestine contribute only about 1.5% to the combined data of ICD 152 and ICD 153. Tumors of the trachea, bronchus and lung are considered together and exclude pleura for the entire time period, regardless of the ICD coding changes. Corpus uteri (ICD 182) is considered separately from ICD 179 (uterus, NOS).

To review trends in time, mortality figures which are independent of shifts in the age distribution of the population are the most relevant. Therefore, age-adjusted rates using the direct method were calculated in our report based on the European standard (Armitage, 1971). The argumentation proposed by Bailar and Smith (1986) to justify their use of age-adjusted mortality rates remains valid and will not be repeated here. The European standard was chosen because the European model population is internationally used as a reference and is a population which best reflects the age structure in the FRG. The use of an international standard has been preferred to a national census standard in order to allow at least a partial comparison between different countries. In addition, age-specific mortality rates for all malignant diseases, excluding lung cancer, are presented so as to complete the pattern of cancer mortality statistics in order to illustrate the impact of progress in cancer treatment.

RESULTS

Overview

Upon examining either the total number of deaths due to cancer or the crude mortality rate, different patterns are seen than for age-adjusted rates (Table I). These 2 first factors, as well as the total percent change, show a substantial increase in cancer deaths in the period 1955–1985, with higher rates for men than for women. In contrast, the overall age-adjusted cancer mortality rates show an increase of only 21.7% which is less than that suggested by the crude rates. Although they again show a rise for males, from 226.9 to 276.2 per 100,000 between 1955 and 1985, the rates for females during this time period actually dropped from 187.8 to 166.3 per 100,000, representing an 11.5% decrease.

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