

CORRESPONDENCE

Declining Bowel Cancer Incidence and Mortality in Germany—An Analysis of Time Trends in the First Ten Years After the Introduction of Screening Colonoscopy

by Prof. Dr. med. Hermann Brenner, Dr. rer. nat. Petra Schrotz-King, Dr. sc. hum. Bernd Holleczeck, Dr. med. Alexander Katalinic, and Dr. sc. hum. Michael Hoffmeister in issue 7/2016

Science Requires Critical Appraisal

The study authors conclude: “The patterns observed indicate that screening colonoscopy has contributed largely to the reduction of colorectal cancer incidence and mortality in Germany. “(1). While this may reflect the understandable wish of the study authors, it is an uncritical interpretation of the findings. In science, critical appraisal is crucial because otherwise we, as physicians, run the risk of giving wrong advice to patients, with harmful consequences. We should base our life style recommendations for healthy people on strong evidence. Therefore, here an attempt of presenting a sober view:

- The study shows a temporal, but not a causal relationship between screening colonoscopy and the decline in colorectal cancer incidence and mortality. The example of the correlation between stork breeding pairs and birth rates ($p = 0.008$) reminds us that correlation does not imply causality (2). The Saarland cancer registry data represented by Brenner et al. in Figure 2 show already a decline in colorectal cancer mortality 20 years before the introduction of screening colonoscopy. Consequently, the decline in mortality must be explained by other factors.
- Even when accepting the speculative assumption that screening colonoscopy had been responsible for the reduction in colorectal cancer mortality, it is conceivable that the all-cause mortality remains unchanged due to the expected colonoscopy-related deaths: According to Figure 1 of the study, colorectal cancer mortality declined during the study period from 28 to 22 in men and from 18 to 13 in women, which represents a reduction of colorectal cancer mortality of 6 and 5 deaths, respectively, per 100 000 per year. Colonoscopy-related deaths, in contrast, are reported as being 0.007% (3). This means 7 deaths in 100 000 colonoscopies. It might be objected that the mortality with screening colonoscopy is potentially lower due to the younger age and better health condition of those examined. But it is even more dramatic, if a comparatively young healthy person dies.

DOI: 10.3238/arztebl.2016.0507a

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In Reply:

It is conventional wisdom that science requires critical appraisal and that correlation does not imply causality.

In medicine, science also needs the best possible evidence for benefits and risks associated with preventive and curative interventions. With regard to colorectal cancer screening, we have faced this challenge by conducting an extensive and differentiated research program which has been presented in detail elsewhere (for example [1–3]).

The analysis of trends in incidence and mortality, which is cited by Dr. Völzke in a very abbreviated and selective fashion, is just one of many elements of this research program.

Therefore, our statement is based on a differentiated and critical appraisal of the incidence and mortality trends in Germany, which have been discussed against the background of the worldwide evidence on colorectal cancer screening effectiveness.

Dr. Völzke presents the available epidemiological data in extremely misleading way so that it appears as if the screening colonoscopy would at least cause the same number of deaths as it prevents. This incorrect interpretation is the result of very serious errors in reasoning. Yearly mortality rates based on the total population regardless of age are compared with a mortality rate of screening colonoscopy (set by far too high), a procedure which is recommended for and offered once or twice to people age >55 years.

A more appropriate approach yields the following results: With a total population of more than 80 million in Germany, a reduction of colorectal mortality by 6 or 5 deaths per 100 000 cases annually translates into the prevention of more than 4000 colorectal cancer deaths per year. According to data from the German national screening colonoscopy registry, there has been on average one colonoscopy-related death per year in Germany since the introduction of screening colonoscopy. The ratio of potentially prevented and caused deaths is therefore more than 4000:1 and not 1:1.

DOI: 10.3238/arztebl.2016.0507b

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Conflict of interest statement

The authors of both contributions declare that no conflict of interest exists.