**Table 4 Joinpoint analysis: trends\* in age-specific cancer mortality rates (per 100,000 persons) among males and females in Serbia, 1991–2015**

| Age | Males | | Females | |
|---|---|---|---|---|
| | Period | APC (95% CI) | Period | APC (95% CI) |
| 0–9 | 1991–2015 | − 2.3* (− 3.9 to − 0.6) | 1991–2015 | − 1.4 (− 2.8 to 0.0) |
| 10–19 | 1991–2015 | − 3.5* (− 5.2 to − 1.8) | 1991–2015 | − 2.2* (− 4.1 to − 0.2) |
| 20–29 | 1991–2015 | − 1.6* (− 2.5 to − 0.8) | 1991–2015 | − 1.3* (− 2.4 to − 0.2) |
| 30–39 | 1991–2015 | − 1.6* (− 2.2 to − 1.0) | 1991–2015 | − 1.6* (− 1.8 to − 1.3) |
| 40–49 | 1991–1998 | 2.3* (1.2 to 3.4) | 1991–2002 | 0.9* (0.0 to 1.8) |
| | 1998–2008 | − 1.7* (− 2.5 to − 1.0) | 2002–2015 | − 1.9* (− 2.6 to − 1.2) |
| | 2008–2015 | − 4.2* (− 5.2 to − 3.2) | AAPC | − 0.7* (− 1.1 to − 0.3) |
| | AAPC | − 1.4* (− 1.9 to − 0.9) | | |
| 50–59 | 1991–1994 | − 1.2 (− 3.7 to 1.3) | 1991–2008 | 1.4* (1.0 to 1.8) |
| | 1994–2007 | 1.9* (1.5 to 2.2) | 2008–2015 | − 1.2 (− 2.5 to 0.3) |
| | 2007–2015 | − 2.3* (− 2.8 to − 1.7) | AAPC | 0.8* (0.6 to 1.1) |
| | AAPC | 0.6* (0.2 to 0.9) | | |
| 60–69 | 1991–2015 | 0.7* (0.5 to 0.8) | 1991–2015 | 0.8* (0.7 to 1.0) |
| 70–79 | 1991–2009 | 1.5* (1.2 to 1.8) | 1991–2009 | 1.2* (1.0 to 1.4) |
| | 2009–2015 | − 0.6 (− 2.1 to 0.9) | 2009–2015 | − 0.9 (− 1.9 to 0.0) |
| | AAPC | 1.1* (0.9 to 1.4) | AAPC | 0.8* (0.6 to 1.0) |
| 80+ | 1991–1994 | − 2.5 (− 8.4 to 3.7) | 1991–2015 | 1.4* (1.2 to 1.7) |
| | 1994–2015 | 2.6* (2.3 to 2.9) | | |
| | AAPC | 2.3* (2.0 to 2.6) | | |

AAPC (average annual percent change) presented for full period

*APC* annual percent change; *CI* confidence interval

\* Statistically significant trend

the censuses of 2002 and 2011, the average age of the entire Serbian population increased by 2 years (from 39.0 to 40.9 years in men and from 41.5 to 43.5 years in women, respectively) [21].

Unfortunately, the prolonged effects of war, manifested in collapsed health care infrastructures, lack of medicines and medical supplies, together with a large number of wounded individuals, created circumstances in which cancer prevention, diagnosis and treatment have been a major challenge in medical practice. One recent meta-analysis pointed out that wars around the globe are making the impact of war-related stress on mortality especially important [23]. However, it is difficult to separate the impact of threats caused by wars on health from the impact of economic sanctions against Serbia, similar to those already seen in Nicaragua and Cuba [24].

According to the 2011 Global Report of the United Nations High Commissioner for Refugees, during the study period, Serbia ranked among the top countries in the world by the number of refugees [25]. The wars in the former Yugoslavia during the 1990s ended with the exile and persecution of many people (around 1,000,000). Twenty years after the first war broke out in the former Yugoslavia, Serbia remains at the top of the

list of European countries in terms of forced migration, as well as one of the five countries in the world facing a prolonged refugee crisis [26]. According to the results of the last census in 2011, there are nearly 300,000 forced migrants living in Serbia, equaling 3.9% of the total population. However, neither the age nor sex structure of the refugee population is different from that of the domestic population. Data for refugees were included in the Serbian population in the present study and could not be set apart as a special contingent.

Since the 1980s, mortality rates from all cancers have been falling rapidly for both sexes in North America and many Western European countries [2, 3, 8]. In some countries, however, such as Brazil, Cuba, and Malaysia, the cancer mortality trends have continued to rise in the last decade in both sexes [27]. After two decades of increase, mortality rates for all cancers have been decreasing since 2009 among both males and females in Serbia, similar to its neighbors and many other countries of the former Eastern communist bloc [28]. Reasons for the substantial decline of cancer mortality rates in Serbia since 2009 have not been completely elucidated. Stabilization of the political, social, and economic situation in the country after the 2000s, as well as the implementation