

Prostate cancer mortality in Serbia, 1991–2010: a joinpoint regression analysis

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ABSTRACT

Background: The aim of this descriptive epidemiological study was to analyze the mortality trend of prostate cancer in Serbia (excluding the Kosovo and Metohia) from 1991 to 2010.

Methods: The age-standardized prostate cancer mortality rates (per 100 000) were calculated by direct standardization, using the World Standard Population. Average annual percentage of change (AAPC) and the corresponding 95% confidence interval (CI) was computed for trend using the joinpoint regression analysis.

Results: Significantly increased trend in prostate cancer mortality was recorded in Serbia continuously from 1991 to 2010 (AAPC = +2.2, 95% CI = 1.6–2.9). Mortality rates for prostate cancer showed a significant upward trend in all men aged 50 and over: AAPC (95% CI) was +1.9% (0.1–3.8) in aged 50–59 years, +1.7% (0.9–2.6) in aged 60–69 years, +2.0% (1.2–2.9) in aged 70–79 years and +3.5% (2.4–4.6) in aged 80 years and over. According to comparability test, prostate cancer mortality trends in majority of age groups were parallel (final selected model failed to reject parallelism, $P > 0.05$).

Conclusion: The increasing prostate cancer mortality trend implies the need for more effective measures of prevention, screening and early diagnosis, as well as prostate cancer treatment in Serbia.

Keywords joinpoint regression analysis, mortality, prostate cancer, trend

Introduction

In 2008, prostate cancer accounted for 258 133 deaths, took sixth place and was deemed accountable for 6.1% of all cancers among men worldwide.^{1,2} Although the number of deaths from prostate cancer is almost the same in both developed and developing regions, the death rates from prostate cancer vary by >20 times around the world.³

The death rates from prostate cancer were high in the predominantly black population (Caribbean—26.3 per 100 000 and Southern Africa—18.5).³ In 2008, mortality rates for prostate cancer were very low in Asia (i.e. in Eastern Asia—2.5 per 100 000) and intermediate in Australia/New Zealand and Europe (15.4 and 11.7, respectively).³

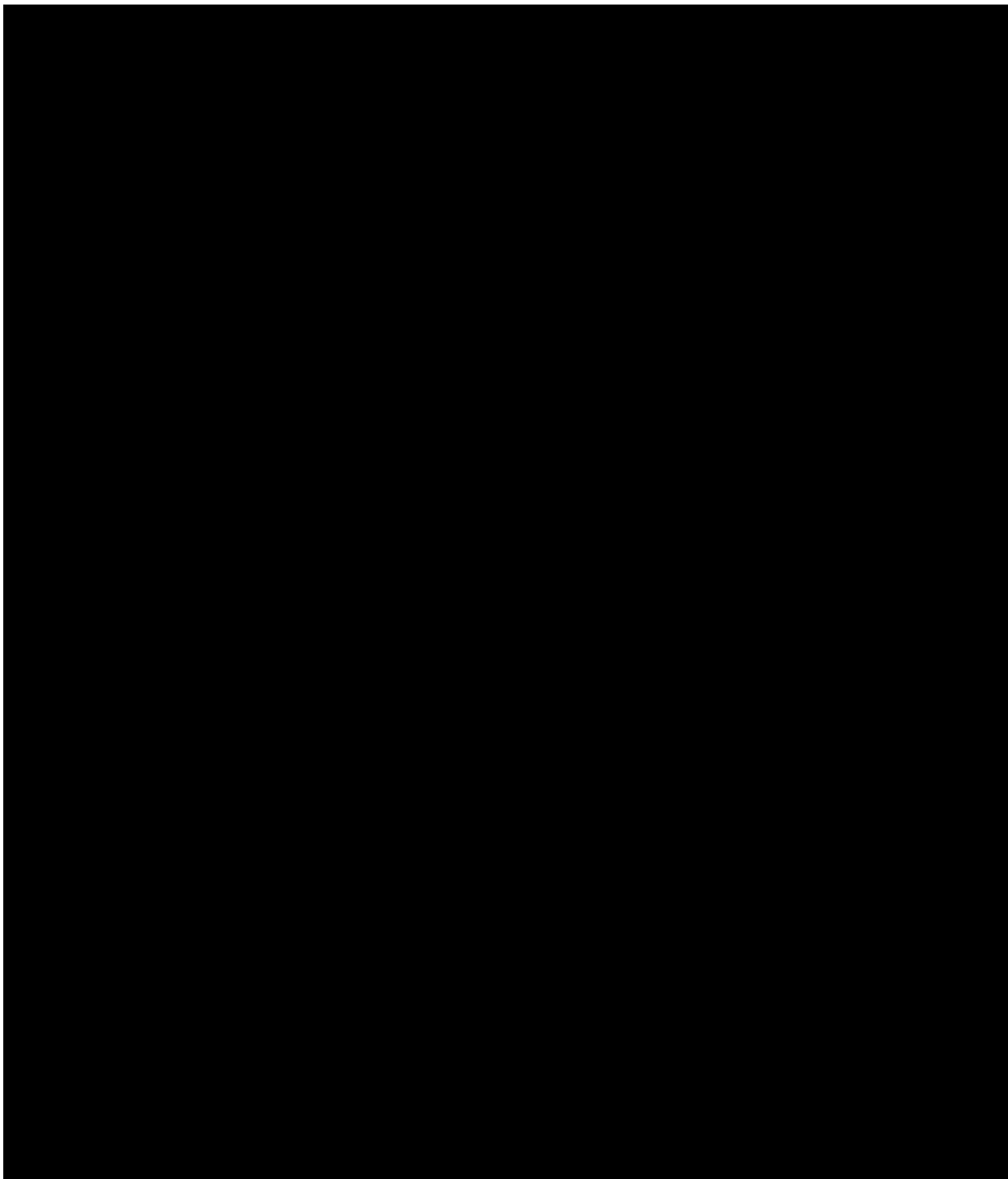
Since the 1990s, prostate cancer mortality rates have been declining in most developed countries (including the USA, the UK, Nordic countries, Western European countries,

Australia).^{4,5} Despite the persistent decline of prostate cancer in males in the USA (–3.3% per year in all races) and in higher resource countries within the European Union (in Luxembourg by –2.5%, Italy –0.8% per year), most countries in Central and Eastern Europe, such as Russia, Croatia and Slovenia, have shown a continuous rise (by +2.6, +1.8 and +1.5% per year, respectively).^{4,5} The decreasing mortality trend for prostate cancer after 1990 may be attributed to the implementation of prostate-specific antigen (PSA) screening and improvements in treatment in developed countries.^{6–9}

Most of the men who died of prostate cancer were aged 65 years or more.⁴ In the oldest, in the age group of 85 years and

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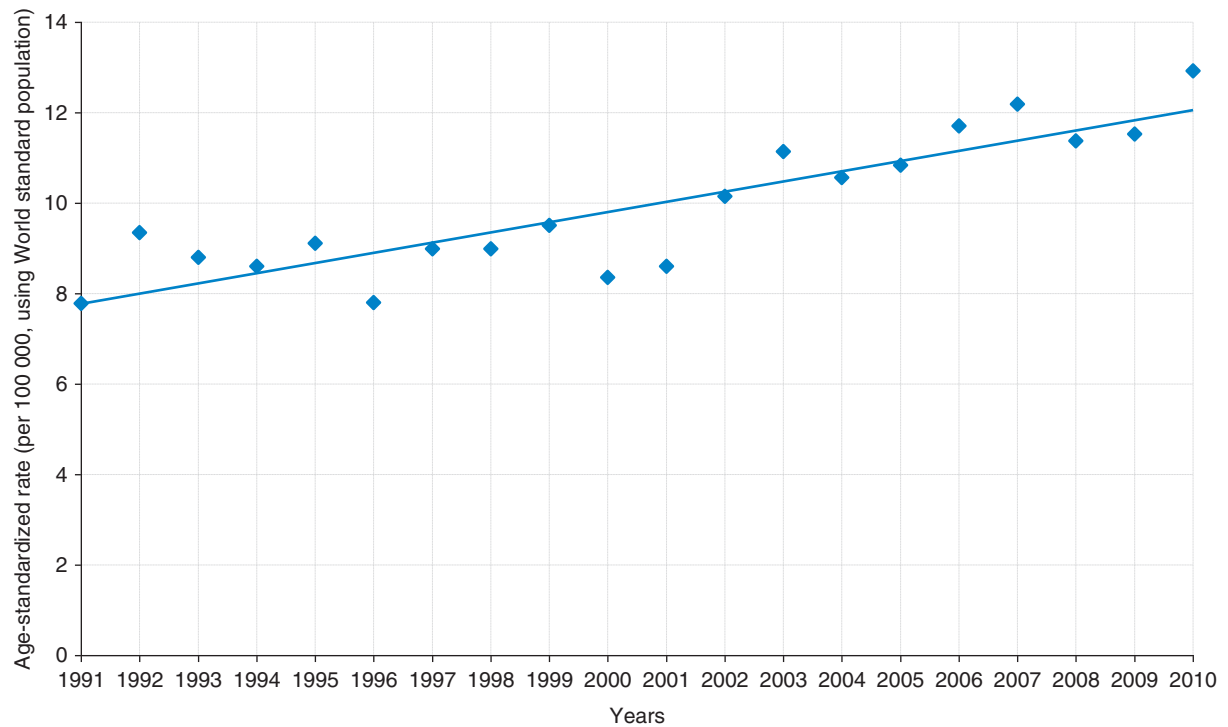


Fig. 1 Joinpoint regression analysis of prostate cancer mortality in Serbia, excluding the Autonomous Province of Kosovo and Metohia, 1991–2010.

Table 1 Joinpoint regression analysis^a of prostate cancer mortality in Serbia, excluding the Autonomous Province of Kosovo and Metohia, by age, 1991–2010.

Age ^b	Year 1991		Year 2010		Number of joinpoints	AAPC ^c	95% CI ^d	
	No of cases	Rates ^e	No of cases	Rates ^e				
Age-specific rates ^e								
Average annual								
50–59	6.04	19	3.57	40	7.21	0	+1.9 ^a	0.1–3.8
60–69	38.70	138	35.49	174	51.13	0	+1.7 ^a	0.9–2.6
70–79	148.32	163	118.89	522	197.91	0	+2.0 ^a	1.2–2.9
80+	269.44	101	169.64	333	345.97	0	+3.5 ^a	2.4–4.6
Age-standardized rates ^e								
Average annual								
All ages	9.92	427	7.78	1071	12.92	0	+2.2 ^a	1.6–2.9

^aStatistically significant trend.

^bJoinpoint results are not shown for the subgroups aged <50 years, because fewer than 10 cases of prostate cancer deaths occurred in each of the decennium in any year.

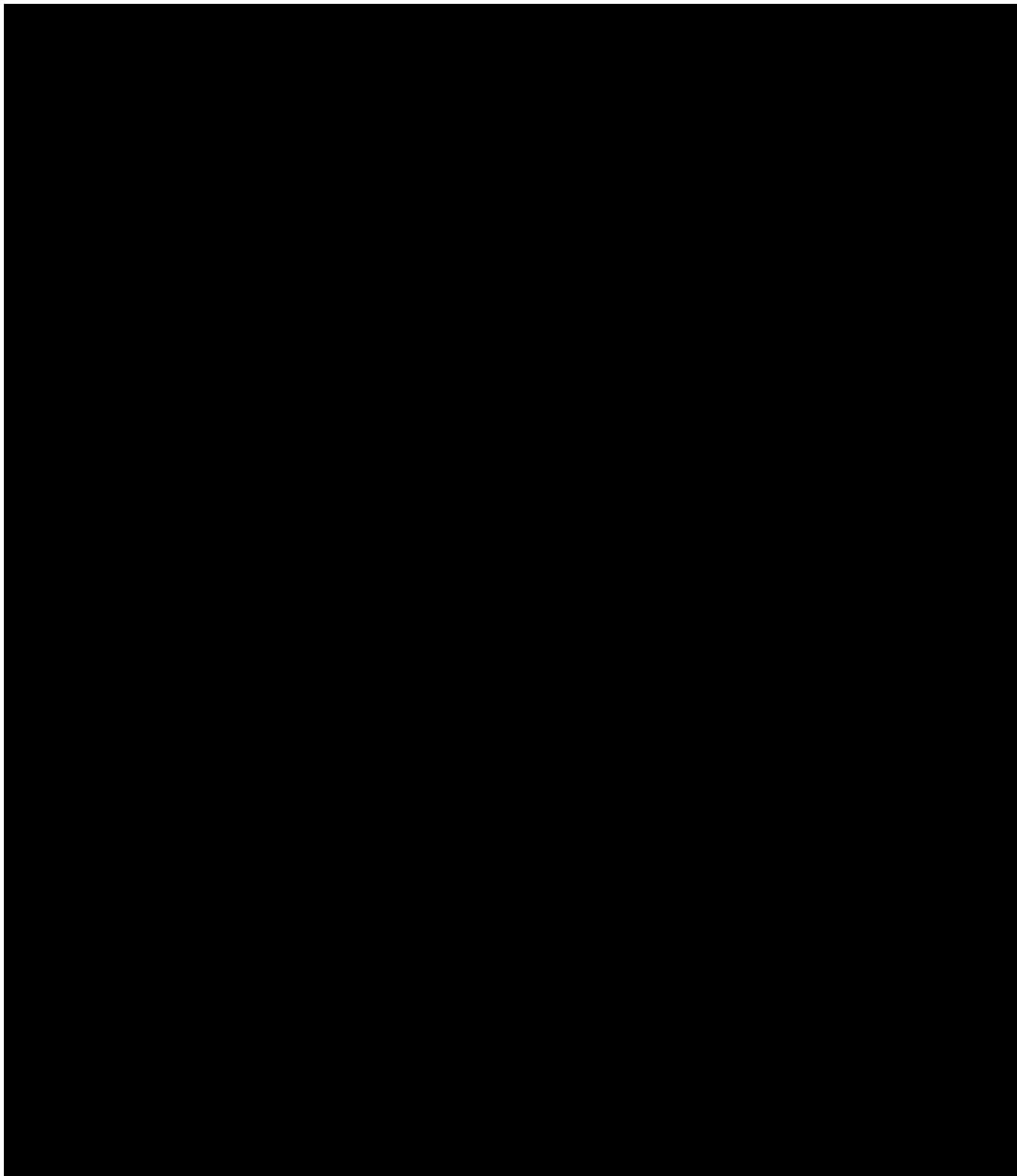
^cAverage Annual Percent Change.

^dCI, confidence interval.

^ePer 100 000.

According to comparability test, only a trend in men aged 80+ years differed significantly from mortality trends in the age group 60–69 years (final selected model rejected

parallelism, $P < 0.05$), while prostate cancer mortality trends in almost all of age groups were parallel (final selected model failed to reject parallelism, $P > 0.05$).



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