OVERDOSE MORTALITY IN CANADA: LONG-TERM TRENDS, AGE AND SEX DISPARITIES, AND REGIONAL VARIATIONS

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Background: Overdose mortality rates have increased in Canada over five decades, yet long-term epidemiological trajectories and regional disparities remain underexplored. This study examines national and provincial overdose mortality trends (1974–2023), identifies key inflection points, and quantifies demographic and geographic disparities.

Methods: A retrospective analysis of the Canadian Vital Statistics Death Database (1974–2023) was conducted. Crude mortality rates (CMR) per 100,000 population were calculated. Segmented regression was used to identify trend shifts and estimate average annual percent change (AAPC). Analyses were stratified by age, sex, and province.

Results: Between 1974 and 2023, 86,750 overdose deaths were recorded nationally. Segmented regression of CMR identified three distinct periods: a gradual increase (1974–2004; AAPC: 1.61%, 95% CI: 1.53–1.69%), followed by two accelerations (2004–2012; AAPC: 6.2%, 95% CI: 5.3–7.0%; and 2013–2023; AAPC: 15.2%, 95% CI: 10.7–19.6%). Recent trends revealed notable demographic differences; mortality among males surged earlier (2012–2023; AAPC: 17.0%, 95% CI: 12.06–21.98%) compared to females (2014–2023; AAPC: 12.7%, 95% CI: 10.09–15.39%). Age-group analyses showed the steepest increases among adults aged 25–44 (AAPC: 16.7%, 95% CI: 11.99–21.39%; 2014–2023) and ≥65 years (AAPC: 18.4%, 95% CI: 14.90–22.00%; 2018–2023). A West-to-East gradient was observed in overdose mortality. Western provinces (British Columbia, Alberta, Saskatchewan) had the highest rates, with steep increases post-2012, particularly in Saskatchewan and. Central Canada (Ontario and Quebec) saw moderate increases, while Atlantic provinces exhibited more variability, with Newfoundland and Labrador rising sharply before declining, and Nova Scotia showing a more gradual increase.

Conclusion: Overdose mortality in Canada accelerated during two distinct periods: first linked to opioid prescribing (2004–2012) and subsequently driven by fentanyl and potent synthetic drugs (2013–2023). Addressing structural factors like housing instability, economic inequality, and healthcare barriers is crucial alongside immediate drug-related risks.

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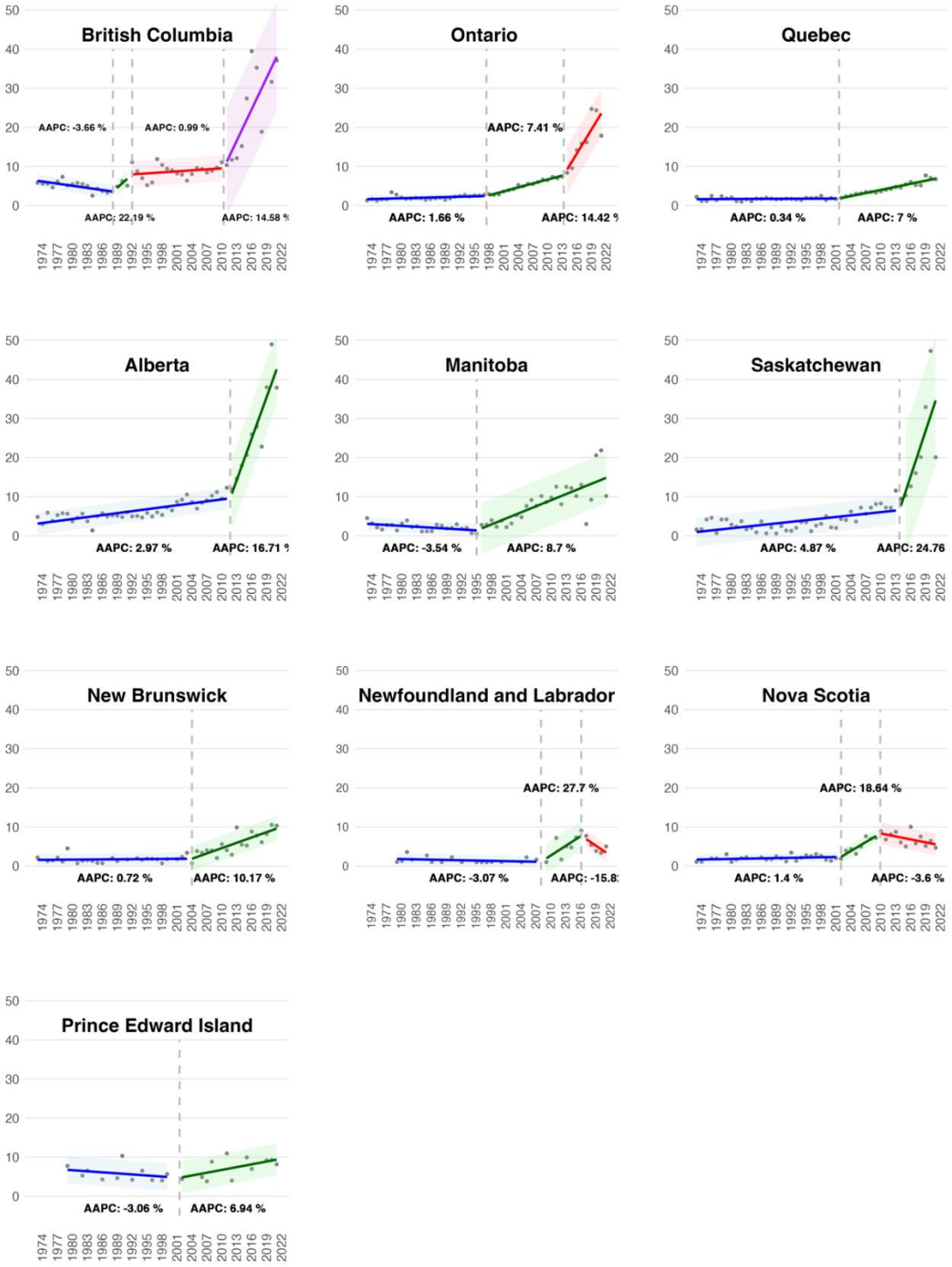
Provincial Trends in Crude Mortality Rates for Overdose Deaths in Canada,1974–2022



Each panel shows mortality rates for overdose deaths in a province, with distinct average annual percent change values for different periods identified by Joinpoint regression. Vertical grey dotted lines mark significant trend shifts, while shaded regions represent 95% confidence intervals. The x-axis shows the year from 1974 to 2022, and the y-axis shows mortality rate per 100,000 population.