

Mortality from motorcycle crashes: The baby-boomer cohort effect

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BACKGROUND/OBJECTIVE

The mileage-based fatality risk for motorcyclists is 31 times that for car occupants. In 2008, motorcyclists made up 14% of the total mortality from motor vehicle crashes, an increase of 132% since 1998. We aimed to assess the cohort effect of the baby-boomer generation in motorcycle crash mortality in the US from 1975 to 2009.

METHODS

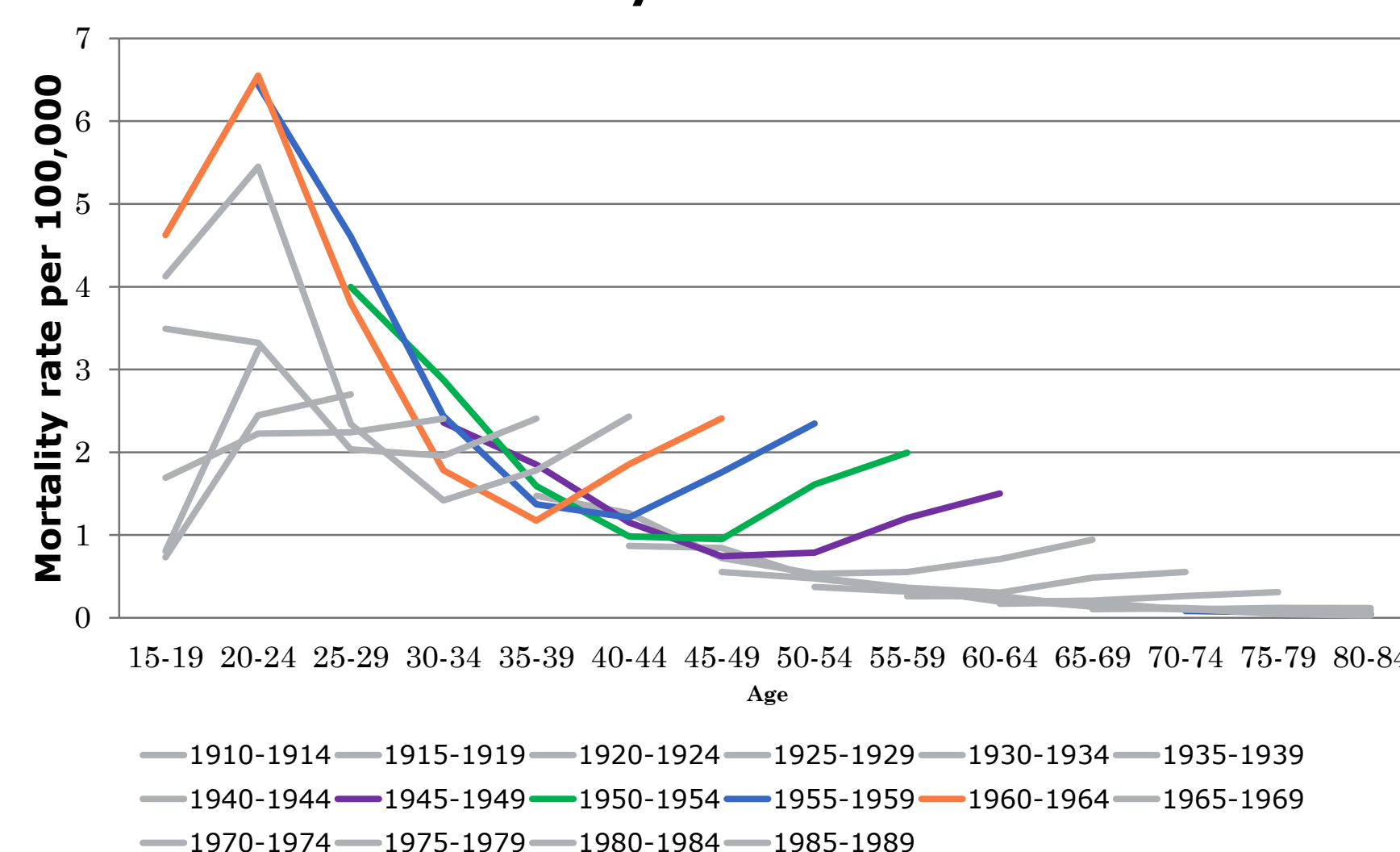
Using data from Fatality Analysis Reporting System (FARS), we performed an age-period-cohort analysis with the three-phase method: 1) a graphical representation and inspection; 2) a median polish to remove the additive components of age and period effects; and 3) a linear regression of median polish residuals to quantify the magnitude of the cohort effect compared to a reference cohort.

Case definition: Motorcycle occupants (riders or passengers) between 15 to 84 years old who died within 30 days from injuries caused by a crash while traveling on a trafficway customarily open to the public in United States from 1975 to 2009.

RESULTS

From 1975 to 2009, annual mortality rates from motorcycle crashes per 100,000 population decreased 6%. Graphical presentation indicated a moderate cohort effect ascribed to the baby boomer generation (i.e., those born between 1955 and 1964, graph 1 & 2). After removing the additive effects of age and period, the estimated mortality risk from motorcycle crashes for "baby boomers" born between 1960 and 1964 was more than three times that for those born between 1940 and 1944 (rate ratio 3.19; 95% CI, 1.56-6.55, graph 3 & table 1).

Graph 1. Age-specific motorcycle mortality rate by birth cohort



Graph 2. Motorcycle mortality rate by age from 1975 to 2009

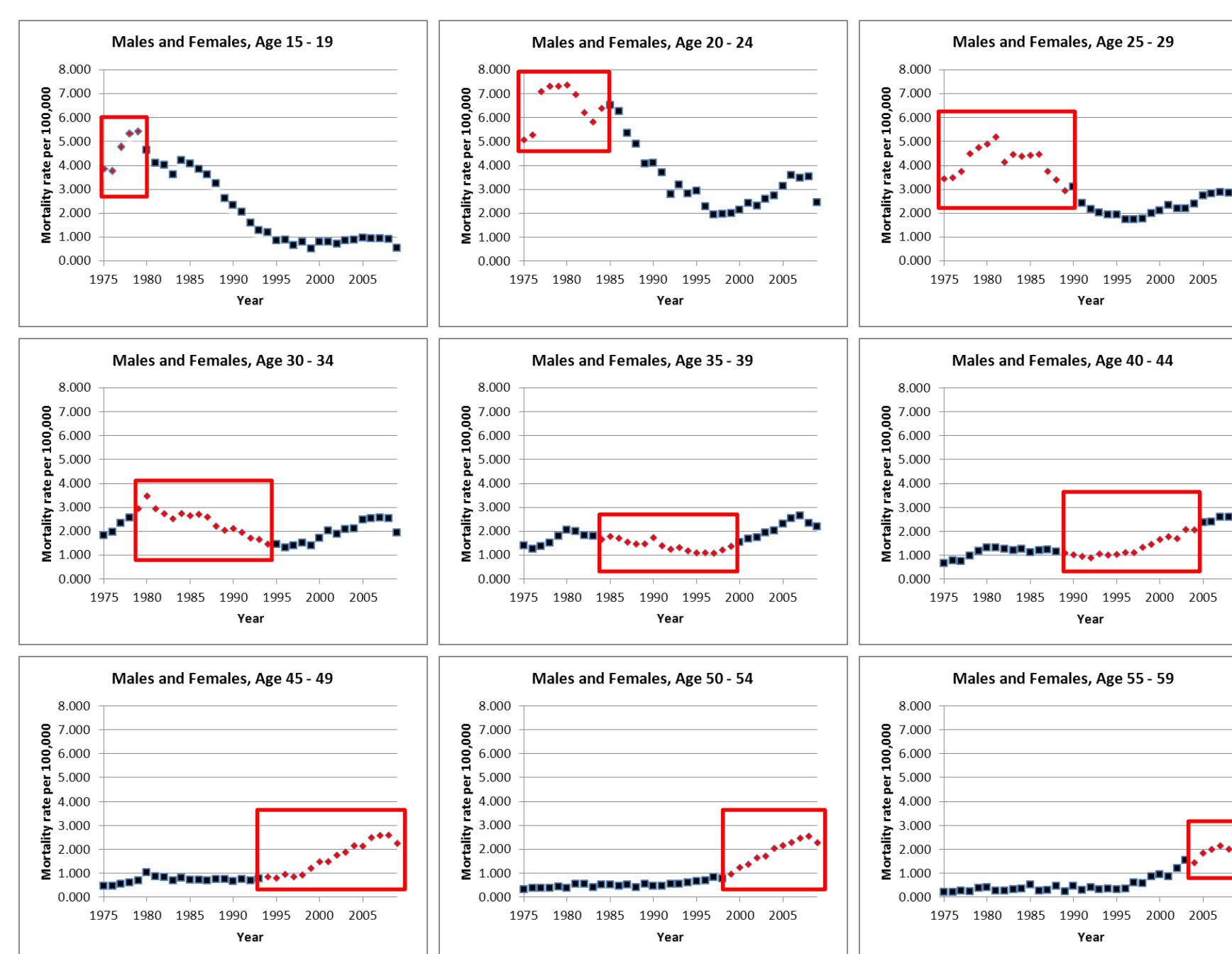
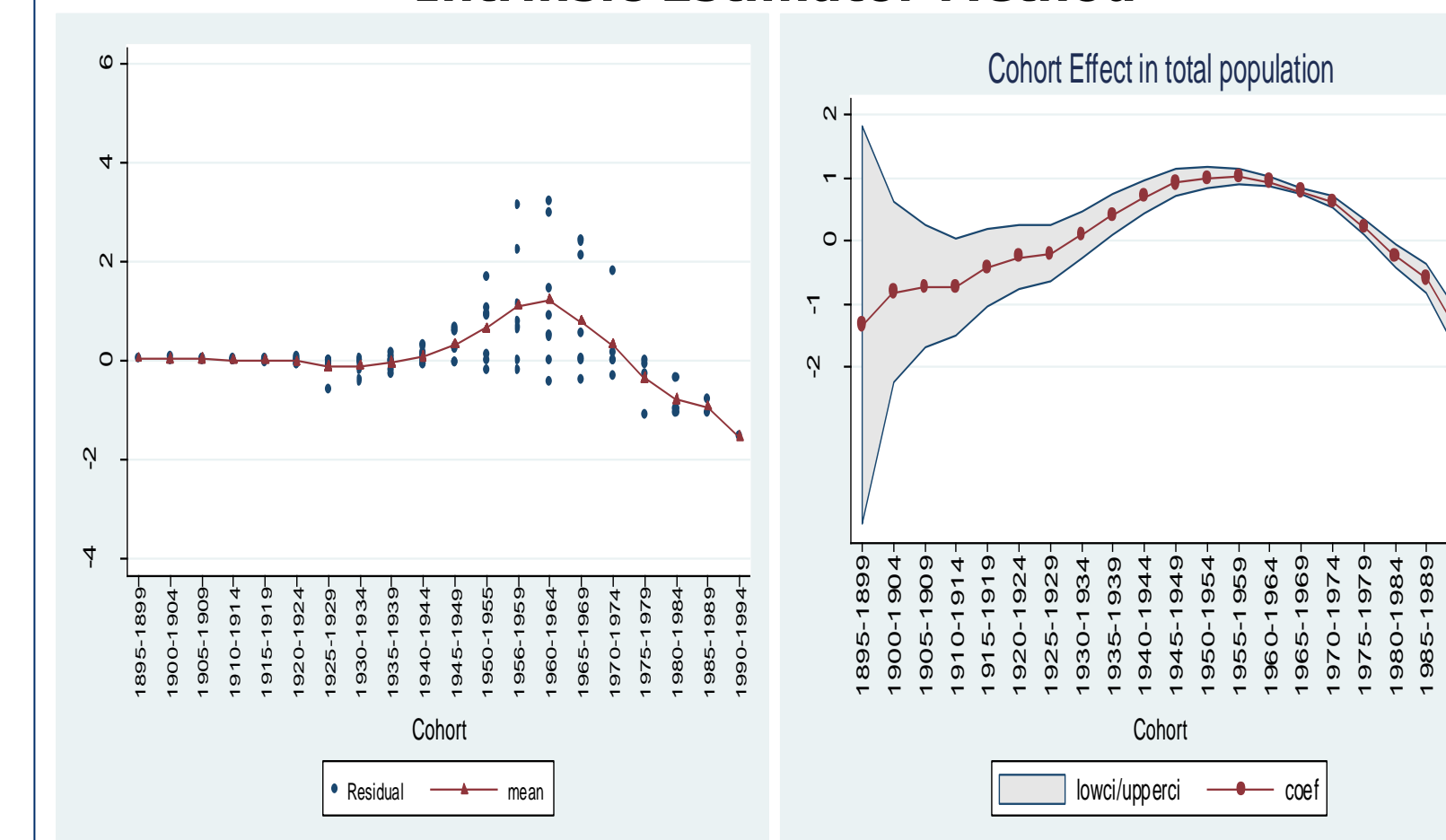


Table 1. Estimated rate ratios and 95% confidence intervals for the effects of birth cohort on motorcycle mortality rate per 100,000 population, United States, 1975-2009

Birth cohort	Rate ratio	95% Confidence interval
1895-1899	0.971	0.231 - 4.084
1900-1904	0.962	0.328 - 2.826
1905-1909	0.959	0.380 - 2.425
1910-1914	0.943	0.406 - 2.189
1915-1919	0.946	0.431 - 2.078
1920-1924	0.919	0.435 - 1.941
1925-1929	0.822	0.401 - 1.686
1930-1934	0.844	0.412 - 1.731
1935-1939	0.894	0.436 - 1.833
1940-1944	1	Reference
1945-1949	1.289	0.628 - 2.643
1950-1954	1.787	0.871 - 3.665
1955-1959	2.826	1.378 - 5.796
1960-1964	3.195	1.558 - 6.552
1965-1969	2.057	0.974 - 4.344
1970-1974	1.287	0.586 - 2.826
1975-1979	0.647	0.279 - 1.503
1980-1984	0.422	0.167 - 1.066
1985-1989	0.369	0.126 - 1.085
1990-1994	0.203	0.048 - 0.853

RESULTS

Graph 3. Median polish residuals plot vs. Intrinsic Estimator Method



CONCLUSIONS

In the U.S. from 1975 to 2009: - 113,065 (91.5%) were male casualties and 10,399 (8.5%) were female casualties. 75% of the females were motorcycle passengers, while 96% of the males were motorcycle drivers. The baby-boomer generation, particularly those born between 1960 and 1964, has experienced significantly higher mortality from motorcycle crashes than the earlier cohort. The median polish method and the intrinsic estimator method found a similar cohort effect. To reduce motorcycle crash mortality, intervention programs specifically tailored for the baby-boomer generation are warranted.

ACKNOWLEDGEMENTS

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