

## **ADJACENT SOUTHEASTERN VIRGINIA CITIES WITH DISSIMILAR HIGH SCHOOL START TIMES MANIFEST DIFFERENT TEENAGE CAR CRASH RATES**

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**Introduction:** Insufficient sleep in teens is linked to academic difficulties, mood disorders and increased car crashes. Delaying high school (HS) start times by one hour in Lexington, Kentucky associated with decreased car crash rates (16.5% decline) over the following 2 years (Danner, Phillips 2008). Virginia Beach (VB) and Chesapeake are adjoining, demographically similar Southeastern Virginia cities. Per 2000 US Census data, VB's and Chesapeake's racial compositions respectively were 71% and 67% Caucasian; and 19% and 28% African-American. Respective per capita incomes were \$22,365 and \$20,949. VB HS begins at 0720-0725 with 1400-1414 dismissal. Chesapeake HS begins at 0840-0845 with 1538-1543 dismissal. We hypothesized that among 16-18 year olds, earlier HS start times in VB versus Chesapeake would cause sleep restriction, interfere with delayed circadian rhythms and associate with increased car crashes.

**Methods:** Virginia Department of Motor Vehicles supplied de-identified data for numbers of drivers ages 16,17,18 years in VB and Chesapeake for 2008, and for number and time of automobile crashes. Crash rates between cities were compared overall, and by time of day to explore circadian propensities.

**Results:** In 2008, VB had 12,916 and Chesapeake 8459 drivers aged 16- 18 years. There were 850 crashes in VB and 394 in Chesapeake. Crash rates were 65.4/1000 and 46.2/1000 respectively (ratio 1.41). Peak morning crash rates in VB were 4.5/1000 from 0700-0759 and 3.8/1000 from 0800-0859 in Chesapeake. Peak afternoon crash rates were 7.1 from 1400-1800 (VB) and 5.8 from 1600-1700 (Chesapeake). 6 hour analysis bins indicated highest car crash rates in the afternoon in both cities, with VB demonstrating the greater rate (35.2 vs. 20.6).

**Conclusion:** In demographically/geographically similar, adjacent cities earlier school start time associated with increased teenage car crash rates, probably reflecting both sleep deprivation and circadian rhythm disruption. Findings support limited data that later high school start times benefit teens.

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