

generalized estimation equation model for panel data.

Results: Partnership (OR 0.93; 95% CI 0.89, 0.97), higher income (>\$50K 0.84; 0.77, 0.91), and White (0.95; 0.91, 1.10) or “other” race (0.84; 0.73, 0.97) were protective against food insecurity over a 5-year time frame post-disaster. Respondents who are female (1.05; 1.01, 1.10), with poor physical (1.08; 1.03, 1.13) or mental health (1.13; 1.09, 1.18), and low social support (1.14; 1.08, 1.20) were more likely to report food insecurity over time.

Conclusions: Improved policies and programs to ensure access to food supplies for vulnerable households are needed to reduce adverse health consequences following disaster.

P85. Trends in Severe Obesity Among 23 Million U.S. Children Aged 2–4 Years Who Enrolled in WIC — United States, 2000–2014



Liping Pan, Sohyun Park, Kelley S. Scanlon, Renata Slayton, Alyson B. Goodman, Heidi M. Blanck. Centers for Disease Control and Prevention, Atlanta, GA, USA

Purpose: To examine trends in prevalence of severe obesity by age, sex, and race/ethnicity (non-Hispanic [NH] white, NH black, Hispanic, American Indian/Alaska Native [AIAN], and Asian/Pacific Islander [PI]) among U.S. children aged 2–4 years who enrolled in WIC during 2000–2014.

Methods: A cross-sectional study used data of 22.6 million young children enrolled in WIC from 50 states, DC, and 5 U.S. territories. Children's weights and heights were measured. Severe obesity was defined as sex-specific BMI-for-age $\geq 120\%$ of the 95th percentile. Children whose sex, weight, height, or BMI were missing or biologically implausible were excluded. Joinpoint regression was used to identify best fitting points where statistically significant changes in overall trend occurred. Log binomial regression adjusted for age, sex, and race/ethnicity was used to estimate prevalence ratios between two inflection years. Adjusted prevalence differences (APD) were calculated based on prevalence at beginning of period and prevalence ratios.

Results: During 2000–2004, prevalence of severe obesity increased significantly overall (from 1.80% to 2.11%, APD=0.26%) and among all the age, sex, and racial/ethnic groups except for Asian/PI (APD ranged from 0.05% to 0.54% across groups with increases). The largest increases occurred in AIANs and 4-year-olds. During 2004–2010, prevalence decreased significantly overall (APD= -0.05%), among boys, 2- and 3-year olds, NH blacks, and Asians/PIs (APD ranged from -0.05% to -0.18%). During 2010–2014, prevalence decreased significantly overall (from 2.12% to 1.96%, APD= -0.14) and among all demographic groups (APD ranged from -0.04% to -0.30%). The largest average relative annual decreases occurred in AIANs and Asians/PIs.

Conclusions: This study provides updated prevalence and trends of severe obesity among young children enrolled in WIC and reports recent modest declines in severe obesity in all subgroups. Ongoing surveillance is needed to assess whether declines continue into the future among low-income children.

Occupation

P86. Associations between Shiftwork and 25-hydroxy Vitamin D3 Levels among Police Officers



Anna Mnatsakanova,^a Luenda E. Charles,^a Cathy A. Tinney-Zara,^a Desta Fekedulegn,^a Ja K. Gu,^a Michael E. Andrew,^a John M. Violanti^b.

^a Biostatistics and Epidemiology Branch, Health Effects Laboratory Division, National Institute for Occupational Safety and Health, Morgantown, WV, ^b University at Buffalo, State University of New York, Buffalo, NY

Purpose: Policing is an occupation that requires shift work. Individuals working at night may develop vitamin D deficiency, which may lead to various health problems.

The aims of this cross-sectional study were to examine the association between shiftwork and 25-hydroxy vitamin D3 (25(OH)D3) levels among police officers and to assess whether seasons modified this relationship.

Methods: Participants were 222 police officers from the Buffalo Cardio-Metabolic Occupational Police Stress study (2011–2014). Shiftwork data were obtained from City of Buffalo, NY daily payroll records. Officers were assigned a dominant shift (day, afternoon, or night) based on the shift in which they worked the highest percentage of hours. The shift worked during the past month was used. 25(OH)D3 was measured by a liquid-phase radioimmunoassay technique. Analysis of

variance/covariance were used to examine the mean levels of 25(OH)D3 across two categories of shiftwork, day and afternoon/night. Seasons specific to the Buffalo, NY climate were defined as Summer (June–August), Fall (September–October), Winter (November through March), and Spring (April–May).

Results: The mean age of officers was 46 years, 28% were female, 52% worked day and 9% worked the night shift. Associations were adjusted for age, sex, race/ethnicity, and multivitamin intake. Mean levels of 25(OH)D3 did not differ significantly across shifts before stratification by seasons. However, after stratification, levels of 25(OH)D3 were significantly higher among officers on the afternoon/night shift compared to those on the day shift (Mean[SE]: 28.5[2.3] vs. 21.8[1.8], respectively, $p=0.033$) for Spring only. During winter, 25(OH)D3 levels were higher among day shift officers compared to afternoon/night shift officers (Mean[SE]: 28.8[1.4] vs. 25.0[1.6], respectively, $p=0.083$). No significant associations were observed during the other seasons.

Conclusion: Results suggest that 25(OH)D3 levels differed significantly by shiftwork status only during the Spring. Future research may investigate the structural or, biological correlates which may explain these findings.

P87. Associations between Shiftwork and Biomarkers of Subclinical Cardiovascular Disease: The BCOPS Study



Cathy Tinney-Zara,^a Anna Mnatsakanova,^a Luenda E. Charles,^a Tara A. Hartley,^a Desta Fekedulegn,^a John M. Violanti,^b Michael E. Andrew^a.

^a Biostatistics and Epidemiology Branch, Health Effects Laboratory Division, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Morgantown, West Virginia, ^b School of Public Health and Health Professions, The State University of New York at Buffalo, Buffalo, New York

Purpose: Police officers work shift schedules and are known to have a higher prevalence of cardiovascular disease (CVD) compared to the general population. Our objective was to investigate associations between shiftwork and select subclinical CVD biomarkers.

Methods: Participants were officers examined in the Buffalo Cardio-Metabolic Occupational Police Stress (BCOPS) study during 2004–2009. Daily electronic payroll records from the City of Buffalo, NY were used to assess dominant shift schedule as day, afternoon, or night. Dominant shift was the shift on which the highest percentage of hours was worked. Fasting blood specimens were collected and analyzed for white blood cell count (WBC), C-reactive protein (hsCRP), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF α) using a standard protocol. Analysis of variance/covariance were used to examine mean levels of all biomarkers across categories of shiftwork. Results were adjusted for age, sex, race/ethnicity, smoking status, body mass index (BMI), total cholesterol, HDL cholesterol, and triglycerides.

Results: The mean age of officers ($n=360$; 74% male) was 41.4 years ($SD=6.4$); 50.3% worked day shift and 22.8% night shift. Among men only, officers on night shift had significantly higher mean WBC count compared with those on day shift [$5.90 \times 10^9/L$ (95% CI=5.62–6.19) vs. $5.45 \times 10^9/L$ (5.23–5.67)]; $p=0.017$. Among officers with BMI ≥ 25 kg/m², those on afternoon shift had significantly higher mean levels of IL-6 compared with those on day shift [2.01 ng/mL (1.77–2.27) vs. 1.54 ng/mL (1.39–1.71)]; $p=0.002$. Also, officers on night shift had significantly higher mean levels of TNF α compared with those on day shift [5.23 pg/mL (4.80–5.70) vs. 4.52 pg/mL (4.25–4.81)]; $p=0.010$. Shiftwork was not significantly associated with hsCRP.

Conclusion: The higher WBC count, IL-6, and TNF α observed among officers working afternoon and night shifts may indicate that they are at increased risk for developing CVD. Further research is warranted.

P88. Influence of Work Characteristics on the Association Between Perceived Police Stress Severity and Sleep Quality



Claudia C. Ma,^a Tara A. Hartley,^a Khachatur Sarkisian,^a Anna Mnatsakanova,^a Desta Fekedulegn,^a John M. Violanti,^b Ja Kook Gu,^a Cathy Tinney-Zara,^a Michael E. Andrew^a.

^a Biostatistics and Epidemiology Branch, Health Effects Laboratory Division, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Morgantown, West Virginia, ^b Department of Epidemiology and Environmental Health, School of Public Health and Health Professions, The State University of New York at Buffalo, Buffalo, New York