

(SD)=0.46 $\frac{1}{4}$ g/L). Concurrent with urine sampling, neuropsychological tests tapping memory, executive function, sustained attention and working memory were combined into a standardized z-score (mean 0, SD 1, 25th and 75th percentiles -0.68 and 0.72, respectively). We used linear models to estimate change in cognition per cadmium interquartile range, incorporating NHANES sampling weights, adjusting for demographic characteristics, diet, lead, and active tobacco use (classified by self-report or serum cotinine levels >10ng/mL). RESULTS/ANTICIPATED RESULTS: A baseline model showed that an IQR (0.38 $\frac{1}{4}$ g/L) increase in urinary cadmium exposure was associated with a 13% standard deviation lower cognitive z-score (95%CI: -0.19, -0.06), after adjusting for sampling weight and urinary creatinine (measure of urine dilution). This association was attenuated to 7% standard deviation lower cognitive z-score (95% CI -0.13, -0.02) after adjusting additionally for demographic characteristic of sex, age, age², race/ethnicity, marital status, education level, and poverty income ratio. Models further adjusted for smoking status (active/former/never), blood lead concentration, and key dietary sources of cadmium showed IQR increase in urinary cadmium exposure associated with 7% standard deviation lower cognitive z-score (95%CI: -0.14, -0.01). DISCUSSION/SIGNIFICANCE: Our findings suggest cadmium exposure is associated with lower cognitive scores even after accounting for confounding influence of diet, tobacco use and lead exposure. Alternate explanations include selection bias due to dropping persons missing needed variables and using concurrent cognitive measures rather than cognitive measures of over time.

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Flavored tobacco sales restrictions and e-cigarette use among high school students in California

Melanie Dove¹, Kevin Gee¹ and Elisa Tong¹

¹University of California, Davis

OBJECTIVES/GOALS: Flavored tobacco sales restrictions (FTSRs) are implemented to reduce access to flavored tobacco products. We examined the association between seven local FTSRs implemented in 2018/2019 and e-cigarette use among high school students in the Bay Area region of California. METHODS/STUDY POPULATION: We analyzed data from the California Healthy Kids Survey using a difference-in-differences (D-I-D) strategy. We compared pre- and post-policy changes one year after implementation in current tobacco use (e-cigarettes and cigarettes) among students exposed (n=20,832) versus unexposed (n=66,126) to a FTSR. Exposed students attended school in a city with a FTSR. Other outcomes included ever use of e-cigarettes, ever marijuana use in an e-cigarette, and ease of access to e-cigarettes. RESULTS/ANTICIPATED RESULTS: Pre- to post-policy, current tobacco use did not change in exposed students (e-cigarette: 10.5% to 11.1%; cigarette 2.6% to 2.5%) and decreased in unexposed students (e-cigarette: 12.8% to 11.4%; cigarette: 2.2% to 1.7%). FTSRs were not associated with a change in odds of current e-cigarette (adjusted D-I-D OR: 1.25, 95% CI: 0.95, 1.65) or cigarette use (adjusted D-I-D OR: 1.24, 95% CI: 0.94, 1.63), relative to unexposed students. For both exposed and unexposed groups, there was a 54-57% increased odds of reporting ease of access to e-cigarettes and a 29-35% increased odds of ever using marijuana in an e-cigarette. No change was detected for ever e-cigarette use. DISCUSSION/SIGNIFICANCE: Local FTSRs in California were not associated with a decrease in e-cigarette or cigarette use one-year post-implementation. Increased ease of access and marijuana use may be explanatory factors.

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Clinical Presentations of Adult and Pediatric SARS-CoV-2-Positive Cases in a Community Cohort

Danielle A Rankin¹, Ahmad Yanis², Harrison Howe², Kailee Fernandez², Rana Talj², James D. Chappell², Andrew Speiker³, Leigh Howard² and Natasha B. Halasa²

¹Vanderbilt University and ²Department of Pediatrics, Vanderbilt University Medical Center and ³Department of Biostatistics, Vanderbilt University Medical Center

OBJECTIVES/GOALS: The spectrum of disease caused by SARS-CoV-2 ranges from asymptomatic detection to severe illness, with varying presentations by age. Therefore, we aimed to compare the clinical characteristics between children and adults with SARS-CoV-2. METHODS/STUDY POPULATION: From March 20, 2020, to August 18, 2021, we conducted SARS-CoV-2 surveillance in individuals from metropolitan Nashville, TN. Children with multi-system inflammatory syndrome were excluded. Analyses were restricted to individuals with SARS-CoV-2 infection confirmed by detection of viral RNA in nasal specimens using reverse-transcription quantitative polymerase chain reaction (RT-qPCR) and/or by detection of serum IgG to the SARS-CoV-2 spike and nucleocapsid proteins using enzyme-linked immunosorbent assay (ELISA). Those with negative RT-qPCR results, but a positive ELISA within 4-6 weeks of symptom onset, were classified as SARS-CoV-2 positive. Clinical characteristics between children and adults were compared with Pearson's chi square. Illness duration was compared using Kaplan Meier estimators. RESULTS/ANTICIPATED RESULTS: Overall, 426/826 (49%) individuals (children: 57 [13%]; adults: 369 [87%]) were SARS-CoV-2 positive, with median ages of 12 and 41 years, respectively. Most individuals were female (54%) and white, non-Hispanic (79%). Compared to adults, children were more likely to be asymptomatic (children: 16% vs. adults: 5%; p=0.001). In contrast, symptomatic adults were more likely to report cough (71% vs. 56%), wheezing (21% vs. 8%), shortness of breath (45% vs. 19%), ageusia (67% vs. 23%), and anosmia (64% vs 27%) than symptomatic children (p<0.05). Mean illness duration was shorter in children than adults: 7 days (95% CI: 5.1, 8.9) vs. 14 days (95% CI: 12.4,15.0), respectively. A total of 5% (18/352) of adults reported symptoms lasting > 4 weeks (range: 31-96 days), whereas all symptoms in children resolved by 31 days. DISCUSSION/SIGNIFICANCE: Overall, children with SARS-CoV-2 present with a shorter and milder disease course compared to adults. Further studies are needed to understand SARS-CoV-2 illness severity across the lifespan.

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Characterizing Physician Suicide in the U.S. (2003-2017)

Daniel Borota¹ and Paul S. Nestadt²

¹Johns Hopkins Bloomberg School of Public Health and ²Department of Psychiatry and Behavioral Sciences, Johns Hopkins Hospital

OBJECTIVES/GOALS: Suicide is a growing public health problem with the rate of suicide increasing 33% since 1999. Physicians are not immune to this growing problem. Physicians represent a unique population that has been understudied with respect to suicide. The aim of the study is to investigate risk factors unique to physicians compared to the general population. METHODS/STUDY POPULATION: Using data from the National Violent Death Reporting System, a nationwide CDC database which aggregates

information on violent deaths, we extracted demographic and circumstantial data on 172,135 suicide decedents \geq 25 years old in participating states from 2003–2017. Of these, we found complete information regarding demographics, occupation, and circumstance for 160,159 suicide decedents. We separated suicide decedents by physician-status and compared 795 physicians to 159,364 non-physician decedents using chi-squared test. We then used multivariate logistic regression to examine differences in suicide method and circumstance by physician-status status, controlling for age, sex, and race. **RESULTS/ANTICIPATED RESULTS:** Compared to non-physicians, physicians were more likely to be male (84.5% vs 77.3%, $p < 0.001$) and older (45.1% \geq 65 vs. 17.8%, $p < 0.001$). Controlling for demographics, physicians were less likely to complete suicide by firearm (aOR=0.60, 95%CI=0.51-0.71) but were more likely to suicide by overdose (aOR=1.41, 95%CI=1.13-1.77) or cutting (aOR=2.81, 95%CI=2.03-3.88). Physicians were more likely to have job related stressors (aOR=2.24, 95%CI=1.83-2.74) and legal problems (aOR=2.34, 95%CI=1.70-3.21). Physicians were also more likely to leave a suicide note (aOR=1.48, 95%CI=1.26-1.73) but were less likely to be intoxicated on alcohol at time of death (aOR=0.76, 95%CI=0.62-0.93). Physicians were no different than non-physicians in terms of financial or relational stressors. **DISCUSSION/SIGNIFICANCE:** Physicians are more likely to be male and older. Given their medical training, overdose and cutting may be more accessible and lethal methods for physicians. Physicians are more likely to leave a suicide note and less likely to be intoxicated, which may imply less impulsivity. Job stressors and legal problems may also contribute to physician suicide.

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Genomic surveillance for SARS-CoV-2 for New Mexico and the Mountain West

Daryl Domman^{1,2}, Valerie Morley¹, Kurt Schwalm³, Jesse Young³, Anastacia Griego⁴, Margaret Siebert⁵, Michael Edwards⁴, Emma Goldberg⁶ and, Darrell Dinwiddie³

¹Center for Global Health, Department of Internal Medicine, University of New Mexico Health Sciences Center, ²Clinical and Translational Science Center, University of New Mexico Health Sciences Center, ³Department of Pediatrics, University of New Mexico Health Sciences Center, ⁴Scientific Laboratory Division, New Mexico Department of Health and ⁵Epidemiology and Response Division, New Mexico Department of Health, ⁶The New Mexico Consortium, Los Alamos, NM

OBJECTIVES/GOALS: Understanding how SARS-CoV-2 is evolving as well as spreading within and between communities is vital for the design of rational, evidence-based control measures. Continuous genomic surveillance is imperative to identify and track variants and can be paired with clinical data, to identify associations with severity or vaccine breakthroughs. **METHODS/STUDY POPULATION:** In June of 2021, we established UNM as a CDC-funded hub for genomic surveillance of SARS-CoV-2 for New Mexico and 3 other Rocky Mountain region states (Wyoming, Idaho, Montana). Through our Rocky Mountain COVID Consortium (RMCC), we have sequenced over 6,000 genomes of SARS-CoV-2 from RMCC partners. For New Mexico we integrate county and zip code data to provide more granular insights into how SARS-CoV-2, and particular variants, are transmitting within the state. We also pair this data with vaccine breakthrough cases identified by the NMDOH, as well as with clinical outcome data. **RESULTS/ANTICIPATED RESULTS:** We sequenced

over 6,000 SARS-CoV-2 genomes from New Mexico (n=3091), Idaho (n=1538), Arkansas (n=1101), Wyoming (n=251), and Montana (n=33). We used this data to infer the transmission dynamics, identify variants, and map the spread of the virus. We identified a novel local variant that spread across New Mexico in early 2021, but was quickly replaced by the Alpha variant. In all RMCC states, the Delta variant overtook Alpha and has become nearly the only variant currently circulating in these states. We identified sequenced isolates from vaccine breakthrough cases in NM and demonstrate their role in onward transmission. We can identify shifts at a county or zip-code level in circulating lineages which may correspond to clinical outcomes or fluctuating case counts. **DISCUSSION/SIGNIFICANCE:** This integrated genomic data can be used by policy and decision makers within the New Mexico Department of Health and our RMCC partners to guide their public health response to the COVID-19 pandemic.

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Identifying Barriers to HPV-Vaccination in the US Veteran Population

Smrithi Chidambaram¹, Angela Mazul², Su-Hsin Chang³ and Jose Zevallos²

¹Washington University in St. Louis, ²Washington University-Department of Otolaryngology and ³Washington University-Department of Public Health Sciences

OBJECTIVES/GOALS: In the United States, oropharyngeal cancer (OPC) is the leading human papilloma-virus (HPV) related malignancy, and OPC rates are increasing among the US veteran population. The purpose of this study is to identify demographic and regional factors that may be associated with low HPV-vaccination rates among the US veteran population. **METHODS/STUDY POPULATION:** This study will use Veterans Health Administration (VHA) administrative data to create a national cross-sectional cohort of veterans ages 18-45 with a VHA primary care visit from 2018-2020. HPV-vaccination status of each subject (initiation of vaccination series, completion of vaccination regimen, and age vaccinated) will be determined. Differences in the prevalence of HPV-vaccination by smoking status, geographic location, socioeconomic status, race/ethnicity, and rural-urban context will be examined in the unadjusted analysis. Factors associated with low HPV-vaccination rates in the VHA will be identified using multivariable logistic regression to model no (vs any) HPV-vaccination, no completion (vs completion) of HPV-vaccination recommendations, and non-routine (vs routine) HPV-vaccination. **RESULTS/ANTICIPATED RESULTS:** In 2019, HPV-vaccination guidelines were expanded to include some adults between the ages of 26-45, making many young veterans in the VHA eligible for vaccination. From this study's recently generated dataset, more than 1.2 million subjects (n=1,219,896) met the study inclusion criteria. Extrapolating from trends in the civilian population, it is anticipated that HPV-vaccination rates will be lower among African Americans compared to non-Hispanic Caucasian Americans, within the South Central and Southeastern regions of the US, and in rural communities. This study will define a veteran's geographic location by their associated Veteran Affairs Integrated Service Network (or VISN), which are groups responsible for healthcare planning and resource allocation in particular regions of the US. **DISCUSSION/SIGNIFICANCE:** Identifying factors associated with low HPV-vaccination rates within the VHA will be the first step to reducing future incidence of HPV-related cancer burden among US veterans.