

of outpatient providers, and two established continuity of care measures (the usual provider of care index and the Bice-Boxerman continuity of care index) over 12 months. We used latent class analysis to categorize patients into classes based on overall, primary care (PCP)-specific, gastroenterology (GI)-specific, and mental health specific-healthcare continuity patterns. RESULTS/ANTICIPATED RESULTS: The 26,751 Veterans in the analytic cohort had a mean of 13.3 (sd 8.63) office visits and 7.2 (sd 3.83) providers per patient. Patients were classified into five phenotypes: (1) moderate overall use and continuity; (2) low overall continuity of care; (3) high GI- and PCP-specific continuity of care; (4) low overall continuity of care with some mental health use; and (5) high utilization with substantial mental health use. In the subsequent year, 11,259 (42.1%) patients had a hospitalization and 16,167 (60.4%) had an emergency department visit. These groups varied in their sociodemographic and clinical characteristics, and in their risk for hospitalization and emergency department use. DISCUSSION/SIGNIFICANCE OF FINDINGS: Latent class analysis revealed five distinct primary and specialty care utilization patterns. Grouping patients with high intensity specialty care needs based on their propensity for healthcare continuity patterns can inform the development of personalized care navigation interventions.

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### Third trimester electronic cigarette use and the risk of preterm birth, low birthweight, and small-for-gestational age

Lin Ammar<sup>1</sup> and Pingsheng Wu Ph.D.<sup>2</sup>

<sup>1</sup>Vanderbilt University Masters of Public Health Program;

<sup>2</sup>Vanderbilt University Medical Center

ABSTRACT IMPACT: Our study suggests that maternal e-cigarette use may reduce fetal growth and pose harm to newborns. OBJECTIVES/GOALS: Women are motivated to quit smoking during pregnancy. Many view electronic cigarettes (e-cigarettes) as a safer and healthier alternative to traditional tobacco smoke. We aim to determine the effect of third-trimester e-cigarette use on the risk of infant related outcomes. METHODS/STUDY POPULATION: We conducted a cross-sectional survey study using Pregnancy Risk Assessment Monitoring System (PRAMS). Women who gave live singleton births in 2016-2018 and at states that met response rate threshold criteria were included. Women were classified as never smokers, sole e-cigarette smokers, sole traditional cigarette smokers, and dual-users. Logistic regression was conducted to determine the association between third-trimester cigarette use and preterm birth (<37 weeks), low birth weight (<2,500 grams), and small for gestational age births (SGA, weight lower than the tenth percentile of the population). Analyses were weighted to account for the survey design and non-response. RESULTS/ANTICIPATED RESULTS: 94,539 women (weighted population of 4,765,290) were included. Compared with never smokers, third-trimester sole e-cigarette use increased the odds of preterm birth (Adjusted odds ratio [AOR]: 1.61, 95% confidence interval [CI]: 1.05, 2.48), low birthweight (AOR: 1.49, 95%CI: 1.06, 2.09), and SGA (AOR: 1.19, 95%CI: 0.71, 2.00), sole traditional cigarette use increased the odds of preterm birth (AOR: 1.36, 95%CI: 1.21, 1.52), low birthweight (AOR: 1.90, 95%CI: 1.72, 2.10), and SGA (AOR: 2.28, 95%CI: 2.05, 2.53); and dual use increased the odds of preterm birth (AOR: 1.17, 95%CI: 0.82, 1.67), low birthweight (AOR: 2.16, 95%CI: 1.58, 2.96), and SGA (AOR: 2.67, 95%CI:

1.97, 3.64). DISCUSSION/SIGNIFICANCE OF FINDINGS: E-cigarette use, by itself or in combination with traditional cigarettes, increases the risk of preterm birth, low birthweight, and SGA. Our study suggests that maternal e-cigarette use may reduce fetal growth and pose harm to newborns.

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### Using Control Charts to Inform Public Health and Community Engagement during the COVID-19 Pandemic

Moira Inkelas<sup>1</sup>, Vladimir G. Manuel<sup>2</sup>, Iheanacho O. Emerewa<sup>1</sup> and Tony Kuo<sup>3</sup>

<sup>1</sup>Fielding School of Public Health, University of California Los Angeles; <sup>2</sup>David Geffen School of Medicine, University of California Los Angeles; <sup>3</sup>Los Angeles County Department of Public Health and Fielding School of Public Health and David Geffen School of Medicine, University of California Los Angeles

ABSTRACT IMPACT: Demonstrate applicability of an underutilized method for showing variation that enables public health agencies to respond to the COVID-19 pandemic OBJECTIVES/GOALS: Enacting sensible public policies in the coronavirus disease 2019 (COVID-19) pandemic requires real-time data that civic and public health leaders can easily interpret and act on. This collaboration between a CTSA and a local health department sought a novel use of control charts to provide timely and interpretable data. METHODS/STUDY POPULATION: Healthcare and other industries use control charts to understand the behavior of processes and systems so they can intervene on them. The CTSA science team developed statistical process control charts at the neighborhood level to help illustrate their value for decision-making as the pandemic progresses. This method included accounting for congregate populations (skilled nursing facilities, correctional facilities) to produce data for the general public. RESULTS/ANTICIPATED RESULTS: Patterns in COVID-19 vary over time by neighborhood. Juxtaposing control charts with social characteristics of local areas in a dashboard format provides granularity for decision-makers and data for engaging communities in changing behavior. Annotating time series charts in real time connects events and local knowledge with observed data, which can help authorities and people to learn and act based on variations displayed by the control charts about disease outbreaks and cases. School districts are among those that could benefit from control charts with information about the school community and how COVID-19 spread is occurring. DISCUSSION/SIGNIFICANCE OF FINDINGS: Control charts have rarely been used in public health despite their ease of use and interpretability. This study demonstrates a novel approach to providing timely, accurate data that can support real-time decision-making of government and public health as well as school districts, businesses, and others.

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### Association between area deprivation index and long-term diabetic complications in a population of diabetic patients'

Riza C. Li, Kevin Ndura and Claudine T. Jurkowitz  
Value Institute, ChristianaCare Health Systems

ABSTRACT IMPACT: To improve care and services for patients with chronic disease, health systems are focusing on evaluating social