Data Science/Biostatistics/Informatics

31115

Perimetric resilience in the retina: spatial distribution of preserved peripheral visual field loci in retinitis pigmentosa

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ABSTRACT IMPACT: We developed a novel semi-automated computational platform to quantify spatial characteristics of preserved peripheral visual field loci in retinitis pigmentosa. This work may inform future research on therapies to prevent visual field loss in retinitis pigmentosa and related diseases. OBJECTIVES/GOALS: Retinitis pigmentosa (RP) causes progressive and severe peripheral visual field (pVF) loss in some but not all patients. The characteristics of pVF in RP are incompletely understood. We developed a novel semi-automated computational platform to quantify the spatial characteristics of pVF. METHODS/STUDY POPULATION: We analyzed preserved pVF size and location in both eyes of RP patients using the Goldmann V4e isopter. We developed a custom algorithm in MATLAB to align and average the binary V4e isopter segmentations, and generated a two-dimensional probability map of the spatial distribution of preserved pVF loci along the radial and circumferential dimensions. To adjust for disease duration, cases were categorized by the time from self-reported symptom onset. Probability maps of pVF preservation were generated for categories of disease duration using unsupervised K-means clustering. Analyzing cases with longitudinal data, we identified loci of stable pVF over time. RESULTS/ANTICIPATED RESULTS: A total of 152 patients were included (N=304 eyes). The mean age was 46.7 years and 49.3% were male. Disease duration was categorized as <20 years (N=72, 47.4%), 20-40 years (N=60, 39.5%), or >40 years (N=20, 13.2%). Longitudinal data (3.2 -5.7 years of follow-up) were available in 65 patients (42.8%). Probability plots of preserved pVF loci in the cross-sectional dataset showed that the median percentage of preserved pVF loci were located between 50 °and 80 °eccentricity and between the 30 °to 50 °meridians, with highly concordant inter-ocular symmetry. Probability plots in the longitudinal dataset showed that inferotemporal pVF loci were most likely to be preserved over time. DISCUSSION/SIGNIFICANCE OF FINDINGS: Semi-automated quantification of pVF loci is a useful platform to analyze spatial characteristics of the visual field in RP. Certain portions of the pVF may be relatively resistant to functional decline. Understanding the molecular basis of pVF resilience will inform further research on RP therapy.

83649

Modeling COVID-19 infection dynamics and program interventions for K-12 school re-opening

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ABSTRACT IMPACT: This study provides public health and K-12 school districts with a pragmatic, flexible, adaptable model showing COVID-19 transmission dynamics, using local data and program elements that are modifiable and with an online model for easy use, to enable safe and equitable re-opening and maintenance of in-person learning. OBJECTIVES/GOALS: School closures resulting from the COVID-19 pandemic disrupt student education and health and exacerbate inequities. Public health agencies and school districts currently lack pragmatic models to assess the effects of potential strategies for resuming and maintaining in-person learning on outcomes such as transmission and attendance. METHODS/STUDY POPULATION: This study explored how various combinations of transmission-mitigating interventions affect health and learning outcomes in a range of underlying epidemiological conditions. The CTSA science team developed a conceptual framework and an agent-based simulation model with parameters including prevalence, transmission, testing, preventive and responsive actions, infection control, population behavior and awareness, and the potential impact of vaccine adoption and exemption policies. The team partnered with a large school district to ensure relevance of the program components to decision-making. RESULTS/ANTICIPATED RESULTS: The model shows that no single program element or condition ensures safety. Combining interventions can result in synergy in the mitigation efforts. Even without testing, an efficient health screening process with forthcoming risk reporting, combined with on-campus infection control, can reduce on-campus transmission. The resulting model is accessible online to enable exploration of likely scenarios. It is adaptable as COVID-19 science evolves, including for testing and vaccines. DISCUSSION/SIGNIFICANCE OF FINDINGS: This research provides public health agencies and school districts with a model that couples local conditions with programmatic elements to help inform the local COVID-19 response, recognizing that decisions about the school community are often complex politically, technically, and operationally when it comes to addressing a health crisis.

91726

Screening for Obesity related renal damage in adolescent women - Body Surface area matters

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ABSTRACT IMPACT: This change will improve primary care physicians and pediatrics ability to identify, intervene and prevent obesity related renal damage in the vulnerable population of young adults OBJECTIVES/GOALS: Obesity related glomerulopathy has a reversible stage manifested as hyperfiltration. Early intervention depends on the ability to identify hyperfiltration. Hyperfiltration prevalence is underestimated using the currently recommended formula We investigated whether calculating BSA-adjusted GFR will more readily identify hyperfiltration. METHODS/STUDY POPULATION: We extracted data from a large urban, multi-institutional Electronic Health Records (EHR) clinical data research network to construct an EHR data base of 60,549 women and girls ages 12-21 years from the New York metropolitan area. EGFR was calculated in two ways, 1) according to age appropriate formula, and 2) according to age appropriate formula and adjusted to body

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surface area (BSA). BMI-for-age values were classified according to the World Health Organization schema and grouped according to the CDC definitions. BSA was calculated according to the Du-Bois formula. Hyperfiltration was defined by a threshold of 135ml/min. The Bland Altman method assessed the agreement between formulas across the different BMI groups. RESULTS/ANTICIPATED RESULTS: Serum creatinine values were similar across different BMI groups. Comparing eGFR values, hyperfiltration rates were similar across BMI groups, ranging between 4%-6.6%. BSA-adjusted GFR was different across BMI groups: hyperfiltration rates were 0.81% for the underweight group, 2.56% for the normal weight, 12.18% for the overweight and 39% in the obese group. This trend of hyperfiltration paralleled the the rise in urine creatinine across BMI groups. DISCUSSION/SIGNIFICANCE OF FINDINGS: BSA-adjusted GFR more sensitively detects hyperfiltration due to obesity than does eGFR. Calculating BSA-adjusted GFR will improve primary care and pediatric physicians' ability to identify, intervene and prevent early ORG. Changes in body composition may account for the increasing discordance between BSA-adjusted and eGFR as BMI rises.

00001

Demographic disparities in proximity to stroke care in the United States*

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ABSTRACT IMPACT: Given the association between lower time to treatment and better clinical outcomes in stroke patients, identifying factors correlated with reduced proximity and thus greater time to stroke care can aid efforts to reduce disparities in stroke outcomes. OBJECTIVES/GOALS: The objective of this study is to quantify the relationship between distance to the nearest certified stroke hospital and census-derived demographics of age, race/ethnicity, income, and insurance status. METHODS/STUDY POPULATION: This is a cross-sectional study. Population data for all census tracts in the contiguous United States were obtained from the US Census Bureau's 2014-2018 American Community Survey. Stroke hospitals were identified from national or state level certification databases and were required to offer at least IV tPA. The main outcome is driving distance in kilometers from each census tract to the nearest certified stroke center, which was calculated using OSMnx, a Python package to retrieve, model and analyze real-world street networks. Quantile regression analysis was used to compare relationships between distances and tract-level demographics of age, race/ethnicity, income, and insurance status. RESULTS/ANTICIPATED RESULTS: 2,423 stroke centers and 71,929 census tracts containing 316,995,649 individuals were included. 49,918 (69%) tracts were urban. Demographic disparities in proximity to certified stroke care were greater in non-urban areas than in urban areas. Higher representation of individuals with age ≤65 years were associated with increased median distance to a certified stroke center in non-urban areas, but not urban areas. Median distance was greater with greater representation of American Indian or uninsured populations in urban and non-urban census tracts. Higher median income was associated with decreased median distance in non-urban census tracts and greater median distance in urban census tracts. DISCUSSION/SIGNIFICANCE OF FINDINGS: Reduced proximity to stroke care exists in areas with greater representation of elderly, American Indian, or uninsured persons; and low median income. These disparities are magnified in non-urban settings. Such knowledge can aid efforts to address and reduce disparities in stroke outcomes.

Evaluation

10543

Assessing Sexual Health Services at a public university in the Deep South

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ABSTRACT IMPACT: Our work helps show universities that embedding dedicated sexual health clinics within university health and wellness clinics may expand the amount of students they see for sexual health screenings during a time of increased sexual behavior and exploration. OBJECTIVES/GOALS: The National College Health Association reports that college students have frequent, condomless sex. Student health and wellness clinics (SHWC) offer sexual health services, but few have dedicated sexual health clinics (SHC). We evaluated sexual health service use at a university SHWC after implementation of a dedicated SHC two half-days per week. METHODS/STUDY POPULATION: This was a retrospective analysis of data collected from patients receiving sexual health screening at the University of Alabama at Birmingham (UAB) SHWC between January 2015 and June 2019. Demographic variables, sexual behaviors, reason for testing, and rates of STIs were extracted from the electronic medical record and were compared by clinic (SHC vs. SHWC). Data on screening visits of patients over 18 were included in the final analysis. Variables were summarized with frequencies and percentages. Univariate models were fit, and multi-variable models will be fit, selecting variables with p values of 0.1 or less. Odds ratios with corresponding 95% confidence intervals for univariate analysis are presented. The study was approved by the UAB Institutional Review Board. RESULTS/ANTICIPATED RESULTS: A total of 5025 STI screenings were performed. Males (OR 4.13; 3.61-4.72), undergraduates (OR 1.33; 1.15-1.54), and persons reporting sex with the same sex (OR 1.88; 1.56-2.28), were significantly more likely to seek care at the SHC. Students with symptoms were more likely to seek care at the SHWC (OR 0.53; 0.47-0.61), while persons who reported contact with STIs were more likely to seek care at the SHC (OR 2.88; 2.22-3.74). The overall percentage of positive screenings was 9.3% for chlamydia (CT), 3.0% for gonorrhea (GC), 0.8% for trichomoniasis (TV), 0.7% for syphilis, and 0.3% for HIV with higher percentages of positive for CT (OR 1.60; 1.30-1.96) and GC (OR 2.02; 1.44-2.85) in the SHC. A greater percentage of positives for TV (OR 0.37; 0.14-0.96) was found in the SHWC. DISCUSSION/SIGNIFICANCE OF FINDINGS: Based on demographics of persons utilizing services, embedding a dedicated SHC within a university SHWC may expand populations reached for STI screening. With higher percentages of patients testing positive for CT and GC, a SHC may allow for greater diagnosis and treatment of STIs in general screening and persons presenting as contacts.

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