



## FORGING A PATH TOWARD CHILD HEALTH EQUITY



## THE CENTER FOR CHILD HEALTH EQUITY AND OUTCOMES RESEARCH



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*Vice President, Health  
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Led by Deena J. Chisolm, PhD, the Center for Child Health Equity and Outcomes Research aims to advance child health, equity and well-being and reduce disparities through research in and across clinical care, health services, health policy and community initiatives.

The Center – with a faculty of more than 15 investigators and affiliate members – uses advanced large data analytics, clinical expertise, qualitative methods and community engagement to conduct research that leads to reduced health disparities, flourishing families, vibrant communities and best outcomes for all children.

The following compendium offers a snapshot of the vital research in progress at the Center for Child Health Equity and Outcomes Research.

Learn more at [NationwideChildrens.org/center-for-child-health-equity-and-outcomes-research](https://NationwideChildrens.org/center-for-child-health-equity-and-outcomes-research).

### OUR MISSION:

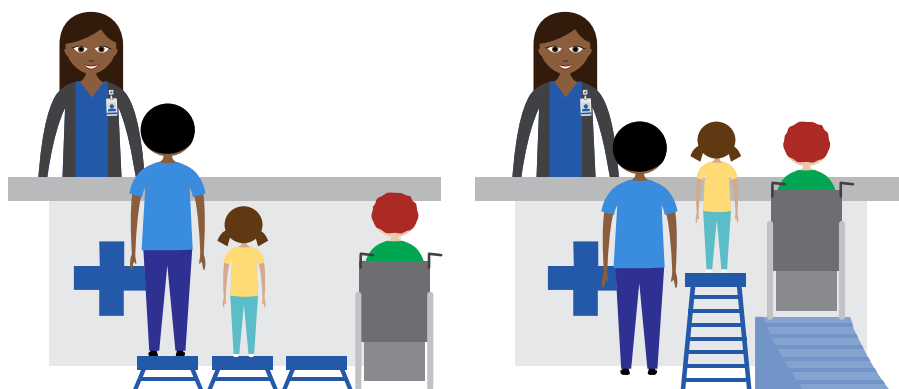
To advance child health, equity and well-being and reduce health disparities through research in and across clinical care, health services, health policy and community initiatives



## UNDERSTANDING EQUITY IN HEALTH CARE DELIVERY AND OUTCOMES

Creary SE, Chisolm DJ, Wrona SK, Cooper JN. Opioid Prescription Filling Trends Among Children with Sickle Cell Disease After the Release of State-Issued Guidelines on Pain Management. *Pain Medicine*. 2020 Oct 1;21(10):2583-2592.

**Objective:** To assess the impact of Ohio's 2012, 2013 and 2016 opioid prescribing guidelines on opioid and nonsteroidal anti-inflammatory drug (NSAID) prescription filling and health care utilization for pain among children with sickle cell disease (SCD). **Design:** Quasi-experimental retrospective cohort study. **Setting:** Ohio Medicaid claims data from August 2011 to August 2016. **Subjects:** Medicaid beneficiaries under age 19 years with SCD. **Methods:** Interrupted time series analyses comparing population-level rates of opioids and NSAID prescriptions filled, standardized amounts of opioids dispensed, and acute health care utilization for pain before and after release of each guideline. **Results:** In our cohort of 1,505 children with SCD, there was a temporary but significant decrease in the opioid filling rate (-2.96 prescriptions per 100 children,  $P = 0.01$ ) and in the amount of opioids dispensed (-31.39 milligram morphine equivalents per filled prescription,  $P < 0.001$ ) after the 2013 guideline but a temporary but significant increase in the opioid filling rate (7.44 prescriptions per 100 children,  $P < 0.001$ ) and in the amount of opioids dispensed (72.73 mg morphine equivalents per filled prescription,  $P < 0.001$ ) after the 2016 guideline. The NSAID filling rate did not significantly change after any of the guidelines. Acute health care utilization rates for pain after the 2016 guideline were similar to those before the 2013 guideline (rate ratio = 1.04,  $P = 0.63$ ). **Conclusions:** Our results suggest that Ohio's 2013 and 2016 guidelines were associated with significant but nonsustained changes in opioid prescription filling among children with SCD. Additional studies are needed to confirm that opioid guidelines have a sustained impact on excessive opioid prescribing, filling and misuse.



Equality/Equity



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## UNDERSTANDING EQUITY IN HEALTH CARE DELIVERY AND OUTCOMES

Cooper JN, Koppera S, Boss EF, Lind MN. **Differences in Tonsillectomy Utilization by Race/Ethnicity, Type of Health Insurance, and Rurality.** *Academic Pediatrics*. 2020 Nov 15:S1876-2859(20)30582-9.

**Objective:** Tonsillectomy is one of the most common pediatric surgical procedures. In previous decades, large geographic variation and racial disparities in its use have been reported. We aimed to compare contemporary rates of pediatric tonsillectomy utilization in the United States by child race/ethnicity, type of health insurance, and metropolitan/non-metropolitan residence. **Methods:** We performed a cross-sectional study using the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project State Ambulatory Surgery and Services Databases and State Inpatient Databases of eight U.S. states. We included all children aged <15 years who underwent tonsillectomy in 2013 to 2017. Annual population-level tonsillectomy rates across states and sociodemographic groups overall and by surgical indication were calculated using U.S. Census data. Negative binomial regression models were used to compare rates between groups. **Results:** In all states evaluated, tonsillectomy utilization was higher in non-Hispanic white children than non-Hispanic black or Hispanic children, higher in publicly insured than privately insured children, and higher in children residing in nonmetropolitan areas as compared to metropolitan areas (all  $P < .05$ ). Tonsillectomy use was highest among white children from nonmetropolitan areas, both overall and for each indication (all  $P < .05$ ). **Conclusions:** Tonsillectomy utilization is higher in U.S. children who are white, publicly insured, and who live in nonmetropolitan areas. Future research should identify multilevel factors, such as those at the patient, family, primary care provider, otolaryngologist, health care delivery system, interpersonal and community levels, that explain these differences in utilization in order to improve the appropriateness and equity of tonsillectomy use in children.



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## EXPLORING SOCIAL FACTORS AND HEALTH

Hardy RY, Liu GC, Kelleher K. **Contribution of Social Determinant of Health Factors to Rural-Urban Preventive Care Differences Among Medicaid Enrollees.** *Academic Pediatrics*. 2021 Jan-Feb;21(1):93-100. doi: 10.1016/j.acap.2020.08.022. Epub 2020 Sep 3.

**Objective:** 1) Assess whether rural-urban disparities are present in pediatric preventive health care utilization; and 2) use regression decomposition to measure the contribution of social determinants of health (SDH) to those disparities. **Methods:** With an Ohio Medicaid population served by a pediatric Accountable Care Organization, Partners For Kids, between 2017 and 2019, we used regression decomposition (a nonlinear multivariate regression decomposition model) to analyze the contribution of patient, provider, and SDH factors to the rural-urban well-child visit gap among children in Ohio. **Results:** Among the 453,519 eligible Medicaid enrollees, 61.2% of urban children received a well-child visit. Well-child visit receipt among children from large rural cities/towns and small/isolated towns was 58.2% and 55.5%, respectively. Comparing large rural towns to urban centers, 55.8% of the 3.0 percentage-point difference was explained by patient, provider, and community-level SDH factors. In comparing small/isolated town to urban centers, 89.8% of the 5.7 percentage-point difference was explained by these characteristics. Of provider characteristics, pediatrician providers were associated with increased well visit receipt. Of the SDH factors, unemployment and education contributed the most to the explained difference in large rural towns while unemployment, education, and food deserts contributed significantly to the small/isolated town difference. **Conclusions:** The receipt of pediatric preventive care is slightly lower in rural communities. While modest, the largest part of the rural-urban preventive care gap can be explained by differences in provider type, poverty, unemployment and education levels. More could be done to improve pediatric preventive care in all communities.



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## EXPLORING SOCIAL FACTORS AND HEALTH

Boch SJ, Taylor DM, Danielson ML, Chisolm DJ, Kelleher KJ. 'Home is where the health is': Housing quality and adult health outcomes in the Survey of Income and Program Participation. *Preventive Medicine*. 2020 Mar;132:105990. doi: 10.1016/j.ypmed.2020.105990. Epub 2020 Jan 15.

Nearly a quarter of the homes in the United States were considered unhealthy or inadequate, but whether these housing characteristics have direct effects on health or whether they are driven by other contextual housing and neighborhood characteristics remains unclear. The purpose of this study was to quantify the independent associations between poor housing quality and adult health outcomes, adjusting for socioeconomic factors (e.g. income to poverty ratio, food insecurity) and other contextual housing characteristics (e.g. rental status, number of people per household, unsafe neighborhood). Using in-person household interview data from wave 1 of the 2014 Survey of Income and Program Participation (SIPP), a secondary analysis was performed using a series of logistic regression models. The 2014 SIPP sample is a multistage stratified sample of 53,070 housing units designed to represent the civilian, noninstitutionalized population of the United States (N = 55,281 adults ages 18 and older). Our results indicate that each additional poor housing characteristic was associated with poorer health status (OR: 1.17, CI [1.11, 1.23]), higher medical utilization (OR: 1.11 CI: [1.06, 1.16]), and a higher likelihood of hospitalization (OR: 1.07, CI [1.02, 1.12]). Non-housing-related government assistance, food security and safe neighborhoods only partially explained associations between housing quality and health outcomes. Evaluating current local, state and federal policy on housing quality standards may help determine if these standards decrease the number of Americans residing in inadequate homes or result in improvements in health and reductions in health care costs. Simply put, the home is where [we suggest] the health is.



## AFFORDABLE QUALITY HOUSING



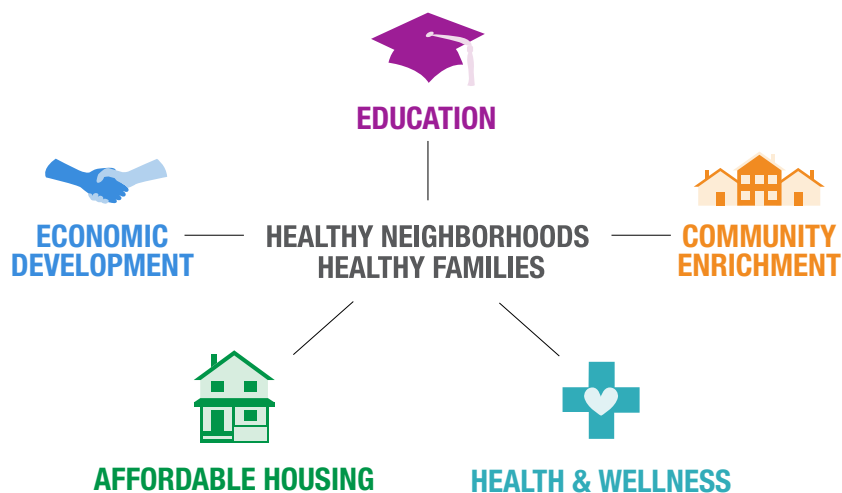
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## BEYOND HEALTH CARE

Chisolm DJ, Jones C, Root ED, Dolce M, Kelleher KJ. A Community Development Program and Reduction in High-Cost Health Care Use. *Pediatrics*. 2020 Aug;146(2):e20194053. doi: 10.1542/peds.2019-4053. Epub 2020 Jul 7.

Adverse housing and neighborhood conditions influence child health. The Healthy Neighborhoods Healthy Families community development initiative was established in 2008 to address housing, education, employment, and other neighborhood-level, child health-influencing factors on the south side of Columbus, Ohio, with the goal of improving child health and well-being. In this article, we discuss the path from advocacy to outcomes analysis in this initiative and assess changes in high-cost health care use by children in the target area over the first decade of implementation. Change in health care use was measured by using a difference-in-differences approach comparing emergency department visits, inpatient stays, and inpatient length of stay in the intervention neighborhood and a propensity score-matched, pooled comparator neighborhood in the same city. The baseline and follow-up periods were August 2008 to July 2010 and August 2015 to July 2017, respectively. Findings from this analysis reveal that compared to two pooled comparison neighborhoods, the intervention neighborhood trended, nonsignificantly, toward greater decreases in inpatient stays and emergency department visits and smaller increases in length of stays. These results suggest that our community development activities may be influencing health care use outcomes, but in the early years of the intervention relative changes are modest and are variable based on the definition of the intervention and comparator neighborhoods. Lessons learned in expanding from advocacy to analysis include the importance of building multidisciplinary teams that can apply novel approaches to analysis, moderating expectations and retaining focus on the broader social context.



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## BEYOND HEALTH CARE

Chavez LJ, Kelleher K, Slesnick N, Holowacz E, Luthy E, Moore L, Ford J. **Virtual Reality Meditation Among Youth Experiencing Homelessness: Pilot Randomized Controlled Trial of Feasibility.** *Journal of Medical Internet Research Mental Health*. 2020 Sep 24;7(9):e18244.

**Background:** Homelessness among youth is devastating, with high rates of substance use disorders and mental health comorbidity. Mindfulness-based interventions that include meditation and mindfulness skills training reduce stress and symptoms of anxiety or depression. However, engaging high-risk youth in interventions is challenging. Virtual reality is a more flexible platform for delivering meditation and may be appealing to youth. **Objective:** The study objectives were to evaluate the feasibility of delivering virtual reality meditation and of collecting outcome measures, including anxiety and physiologic stress. **Methods:** A sample of 30 youth experiencing homelessness was enrolled in the study. Youth were randomized to receive 10 minutes of one of three interventions: (1) virtual reality meditation, (2) audio meditation (through a web-based platform), or (3) virtual reality imagery of historical pictures and text. Subjects who consented to the study attended two research visits. The first visit collected survey measures of demographics, mental health, and substance use, and oriented subjects to the intervention platforms. The second visit (one to three days later) delivered the intervention and collected pre and post outcome measures of anxiety and physiologic stress (salivary cortisol). Changes in anxiety and cortisol at the second visit were compared across groups using a linear regression model in which the primary analysis compared virtual reality meditation to audio meditation and secondary analyses compared virtual reality meditation to virtual reality imagery. **Results:** Anxiety scores decreased in all groups, with a larger reduction among the virtual reality meditation group (difference=10.8) compared to the web-based meditation or virtual reality images groups (difference=5.8 and 5.0, respectively). After controlling for baseline values, there were no significant group differences in changes in anxiety scores or cortisol levels. In comparing virtual reality meditation and audio meditation, the effect size for anxiety was moderate (Cohen  $d=0.58$ ) while the effect size for cortisol was small (Cohen  $d=0.08$ ). **Conclusions:** Preliminary results suggest that virtual reality meditation has a moderate benefit for anxiety but not physiologic stress. Future research is needed to confirm these results in a larger sample and to investigate whether the effects are sustained or increase with repeated use of virtual reality mediation. Virtual reality meditation appears feasible to deliver among homeless youth and merits further study.





## COMMENTARIES: LEADING THE DISCUSSION

Perrin JM, Duncan G, Diaz A, Kelleher K. **Principles And Policies To Strengthen Child And Adolescent Health And Well-Being.** *Health Affairs* (Millwood). 2020 Oct;39(10):1677-1683.

Four recent reports from the National Academies of Sciences, Engineering, and Medicine framed around the issues of poverty; mental, emotional and behavioral health; adolescence; and young family health and education build on extensive recent evidence of what can be done to improve the health and well-being of children, youth, and families. We describe the process of generating the reports, briefly summarize each report's content, and identify crosscutting themes and recommendations. We also note how the coronavirus disease 2019 (COVID-19) pandemic highlights major disparities and systemic problems addressed in the reports and heightens the relevance of their policy recommendations. The reports issue a unified, urgent call for measures with the potential to change the trajectory and outcomes for children and youth. Among these are basic income supports, other family supports, universal health care structured to meet family needs, and a broad national policy that prioritizes children and youth.

Kemper AR, Kelleher KJ, Allen S, Sander C, Brill R. **Improving the Health of All Children in Our Community: The Nationwide Children's Hospital and Franklin County, Ohio, Pediatric Vital Signs Project.** *Journal of Pediatrics*. 2020 Jul;222:227-230

**Description:** The Pediatric Vital Signs program is a first-of-its-kind community-based initiative designed to meaningfully measure and improve the health of all children, both patients and non-patients, in Franklin County, Ohio. The initiative seeks to address the issues facing area youth that fundamentally affect their health, as well as the health of the entire community.

The Pediatric Vital Signs are eight metrics that span childhood: infant mortality, kindergarten readiness, high school graduation, obesity, teenage pregnancy, suicide, all-cause child mortality and a hybrid measure called preventive services delivery. All impact a child's life and health, even if they are not strictly health care related. All have elements of racial and ethnic disparity. All need a broad coalition of stakeholders, including public health officials, schools, non-profit agencies, civic organizations and local governments, to join together to improve the health of all children.



## MORE CITATIONS

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Chavez LJ, Cooper JN, Deans KJ, Wrona S, Zaim H, Sebastião Y, Chisolm DJ. Evaluation of racial disparities in postoperative opioid prescription filling after common pediatric surgical procedures. *Journal of Pediatric Surgery*. 2020 Dec;55(12):2575-2583. doi: 10.1016/j.jpedsurg.2020.07.024. Epub 2020 Jul 29. PMID: 32829884.

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Khalsa AS, Copeland KA, Misik L, Brown CL, Kharofa RY, Ollberding NJ. Maternal Body Dissatisfaction and Accuracy of Infant Weight Perception in Families From Low-Income Backgrounds. *Academic Pediatrics*. 2020 Aug;20(6):793-800. doi: 10.1016/j.acap.2020.03.009. Epub 2020 Apr 2. PMID: 32247669.

