COVID-19, Community Firearm Violence, and Youth Depression and Suicide Risk in Philadelphia

J. Min[1,2,3], V. Tam[3], S. Jacoby[1], C. McDonald[1,2,3], S. Mayne[2,3]

1 University of Pennsylvania School of Nursing, 2 University of Pennsylvania Perelman School of Medicine, 3 Children's Hospital of Philadelphia, PA

INTRODUCTION

- Adolescent depression and suicide deaths increased during the COVID-19 pandemic.
- Community firearm violence also rose during the pandemic and has since declined to pre-pandemic levels.
- However, whether these declines in violence have translated into improvements in youth mental health remains unknown.

AIMS

- Assess whether youth mental health risk declined as community firearm violence decreased in the post-pandemic period.
- Examine whether community firearm violence moderated post-pandemic trajectories in youth mental health.

METHODS

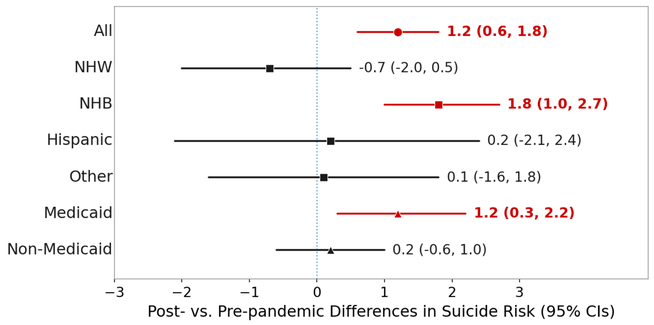
- **Design**: Cross-sectional study using 2017–2024 EHR data from a 31-clinic pediatric primary care network in Philadelphia
- **Sample**: 35,137 patients (ages 12–18) with 71,663 well visits completing the Patient Health Questionnaire, modified for teens (PHQ-9-M)
- **Exposure**:
  1) Pre-pandemic (11.1.2017-3.22.2020), Pandemic (6.1.2020-5.4.2023) and Post-pandemic (through 12.31.2024). The early pandemic period was excluded.
  2) **Clusters of community firearm violence:** Census tract-level cumulative rates (2017-2024); clusters identified within each periods.
- **Mental health screening outcomes using PHQ-9-M**:
  1) Depressive symptoms
  2) Suicide risk (EHR flagged either lifetime attempt or recent suicidality)
- **Analyses**:
  1) Getis-Ord Gi* hotspot analysis
  2) Logistic regression models with clustered robust standard errors for patient clustering
  3) Interaction terms to assess moderation (3 firearm violence clusters X 3 pandemic period)

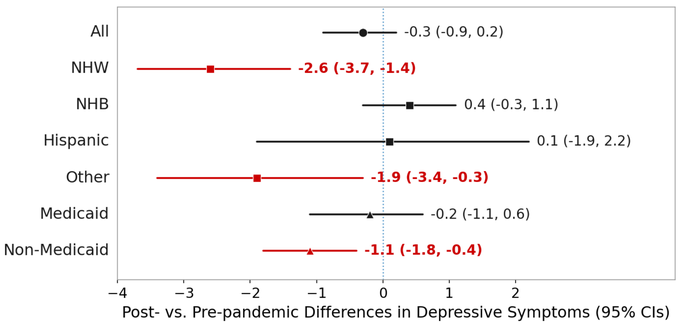
CONCLUSIONS

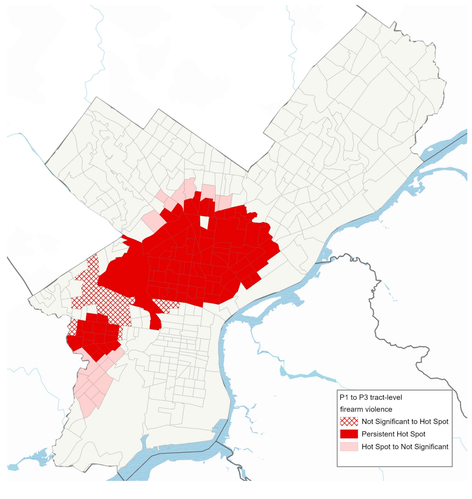
- Non-Hispanic Black youth, Medicaid-insured youth, and youth residing in high firearm violence areas maintained elevated suicide risk, whereas those in low-violence areas experienced declines.
- Community firearm violence moderated youth suicide risk, even after accounting for neighborhood socioeconomic resources and conditions in the models.

RESULTS

Pre–during–post pandemic changes in Mental health outcomes (%):
- Suicide risk: 10 → 12 → 11 %
- Depressive symptoms: 8 → 9 → 7 %

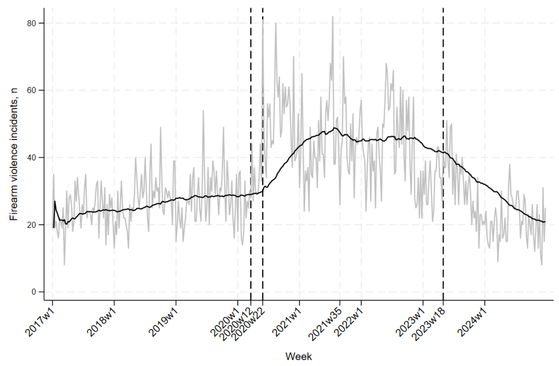




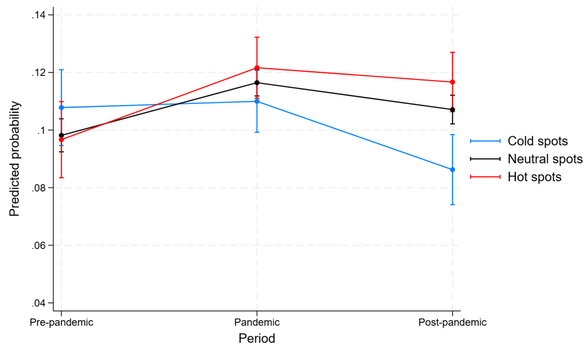


Consistent clusters of firearm violence 2017-2024

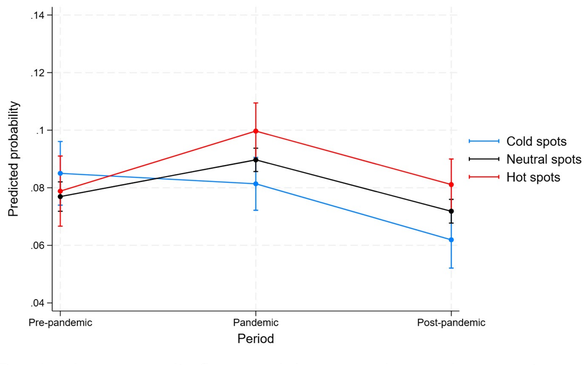
Sample characteristics:
- 50% female, 67% non-Hispanic Black
- 57% Medicaid insured, 52% living in very-low COI areas
- 13% living in high firearm violence areas



Community firearm violence incidents in 2017-2024



Pandemic-community firearm violence on suicide risk



Pandemic-community firearm violence on depressive symptoms

IMPLICATIONS

Incorporating community-level context into universal depression and suicide risk screening in pediatric primary care is critical for informing follow-up and referral decisions.

CONTACT

Jungwon Min, PhD, MS
Research Professor
University of Pennsylvania School of Nursing
minj1@upenn.edu