Emergency Department Visits, Survey Results, Administrative Data: Leveraging Local Data Sources to Understand Trends in Adolescent Mental Health

Abstract

As rates of depression and anxiety continue to rise, prevention and treatment of poor mental health in young adults is a major challenge for population health. Within the US context, adolescents spend much of their days in a school environment, and a growing body of literature is examining the relationship between school climate and student mental health. In this study, we extend the notion of school climate by creating a novel indirect summary measure related to both prevalence of depressive symptoms and school policy and resources: emergency department visit intensity. We then link the ED intensity measure to three years of the New York City Youth Risk and Behavior Survey (2015, 2017, 2019) and test the intensity measure in a series of sequential models with district-level fixed effects. We find strong evidence for a relationship between known school climate indicators and prevalence of depressive symptoms. While we do not find evidence of an association between district level ED visit intensity and prevalence of depressive symptoms, we do identify additional variation within school districts that has yet to be explored and propose several avenues for further research.

1 Introduction

Recent studies continue to reveal rising rates of depression and suicide ideation in adolescents across the United States (Keyes et al., 2019; Ivey-Stephenson, 2020; Pontes et al., 2020; Daly, 2022; Gaylor, 2023). Estimates from the National Survey on Drug Use and Health suggest that prevalence of a major depressive episode increased by 7.7% between 2009 and 2019 (Daly, 2022, p. 497). Evidence from the national Youth Risk Behavior Survey indicates that suicide ideation has increased from 6.3% in 2009 to 18.8% in 2019 (Ivey-Stephenson, 2020; Gaylor, 2023). Trends from the Monitoring the Future yearly surveys have found that depression trends, while decreasing from 1991-2011, have rebounded since and continue to increase (Keyes et al., 2019).

The increasing prevalence is not evenly distributed across subgroups; adolescent girls seem to be particularly affected and report higher rates of depression, suicide ideation, and suicide attempts across a range of surveys (Alhajji et al., 2019; Keyes et al., 2019; Mojtabai & Olfson, 2020; Pontes et al., 2020; Daly, 2022; King et al., 2022; Jacobs et al., 2023; Nicholson et al., 2023). At the same time, estimates of care provision for mental health over the same period have remained steady at 19.7% (or one in five), while the composition has shifted to more visits by adolescent girls, more visits for suicide ideation and depressive symptoms, and a decrease in care provided by school counselors nationally (Mojtabai & Olfson, 2020). These trends paint a worrying picture for mental health among adolescents.

A growing body of research suggests that elements of the psychosocial environment of the school may be associated with rates of depression in the adolescent populations (Seil et al., 2014; Aldridge & McChesney, 2018; Colvin et al., 2019; Ancheta et al., 2021; Raniti et al., 2022; Welty et al., 2024). These elements may include measures of bullying/victimization, perceptions of belonging, perceptions of school safety, having a trusted adult at school, and disciplinary structures among others (Suldo et al., 2012; Seil et al., 2014; Aldridge & McChesney, 2018; Grazia & Molinari, 2021; Raniti et al., 2022). Together, these elements are often enveloped into measures of "school climate," or "the

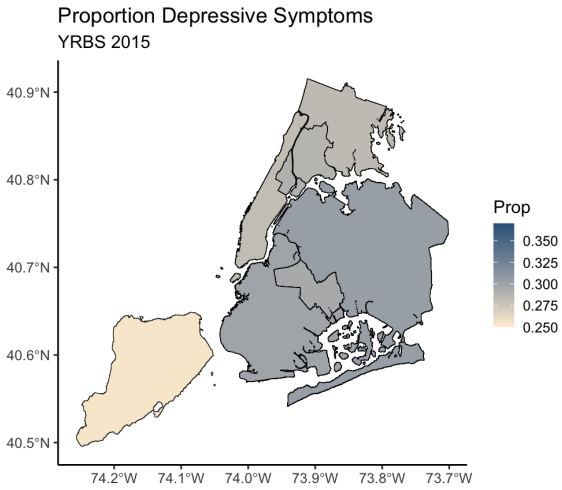
quality and character of school life" (National School Climate Center, 2021). Per the 2007 National School Climate Council, "school climate is based on patterns of students', parents' and school personnel's experience of school life; it also reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures" (Suldo et al., 2012; Aldridge & McChesney, 2018; National School Climate Center, 2021).

In this paper, we extend the notion of school climate by creating a summary measure related to both prevalence of depressive symptoms and school policy and resources: emergency department visit intensity. Constructed at the district-level, this measure combines data from a statewide syndromic surveillance system and school-level demographic data to capture the rate at which students enter into a hospital emergency department with a mental-health related visit. The construction of the district ED intensity aims to capture students that enter into the hospital system within school hours and the academic year with the assumption that a sizeable portion of these students are being sent directly from school, and the expectation is that there is likely some variation in district-level ED visit intensities. This variation could be coming from differences in student compositions, differences in school capacity, as well as differences in district policy or resources allocation. Similarly, rates of depression could be influenced by these district-level policies. We then test this ED intensity measure in the context of other individual and school climate characteristics to see if there is evidence of an association with individual depression rates.

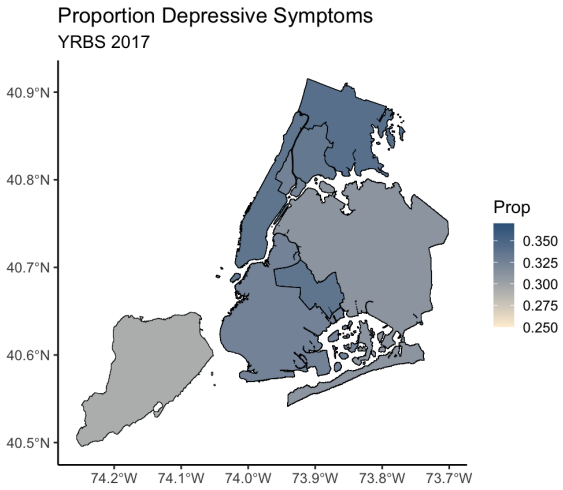
2 Preliminary Results

Overall the estimated mean proportion of students reporting depressive symptoms increased over the period. In 2015, 29.5% (95%CI [27.5,31.0]) were estimated to have experienced depressive symptoms, in 2017 31.6% (95%CI [30.1,33.0]) and in 2019 35.9% (95% CI [34.3, 39.0]). Figure 1 shows the point estimates disaggregated to the Neighborhood Health Action Centers by borough. Across all years, the proportion of students reporting depressive symptoms is above 15%. The ED visits for mental health related reasons are falling from 2014-2021 (even prior to COVID-19), the modeled ED intensities per district are shown in Figure 2. The decline is particularly prevalent among male adolescents.

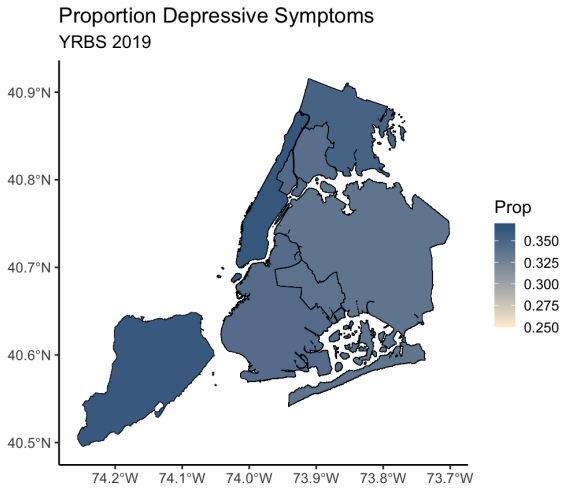
After linking the ED intensity to the YRBS by year, sex and district of school, we assess the association between likelihood of reporting depressive symptoms (LHS) and district ED intensity, individual characteristics, and other school climate perceptions (RHS). Unadjusted models suggest a strong association between district ED intensity and reporting depressive symptoms. Models including individual and school climate perceptions attenuate the association, but significant district fixed effects suggests unexplained variation at the district level.



((a)) YRBS 2017



((b)) YRBS 2015



((c)) YRBS 2019

Figure 1: The maps here display the proportion of students from each Neighborhood Health Action Centers (by borough) reporting depressive symptoms in the past year for the Youth Risk and Behavior Survey.

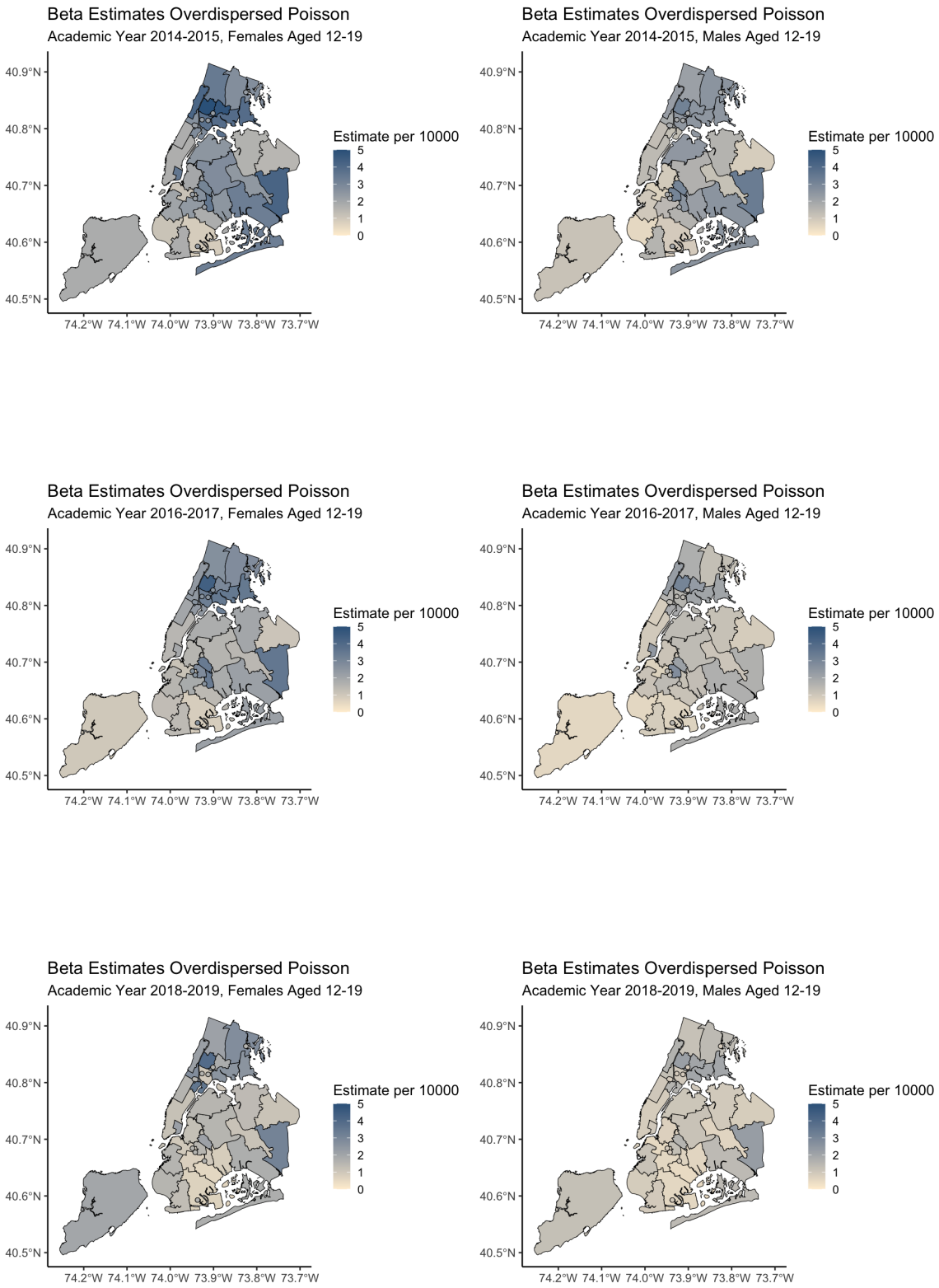


Figure 2: The ED intensities from the overdispersed Poisson model estimates by district and sex and year. The estimates are presented per 10,000 students for easier interpretation.

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