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ROLE OF ADOLESCENT-ADULT CONNECTION IN ASSAULT INJURY PREVENTION AMONG MALE YOUTH IN URBAN LOW-RESOURCE NEIGHBORHOODS

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Purpose: Research examining the role of adult connection in violence prevention among youth in under-resourced urban neighborhoods has relied on self-reported violence exposure and suggests that families struggle to protect youth in these contexts. However, no prior studies have used objective measures of assault injury. This study examines associations between supportive adult connections and objective measures of assault injury among male youth in low-resource neighborhoods.

Methods: We conducted a population-based case-control study among adolescent males, ages 10-24, to study associations between adolescent-adult relationships and assault injury. We recruited victims of gunshot assault injury and non-gun assault injury from two Level I trauma centers in Philadelphia, PA. We recruited adolescent male controls using random digit dial from the same catchment area and matched to gunshot cases on age and race. Adolescent-adult connections were measured through two distinct methods during structured in-person interviews. First, positive adult connection was defined by whether youth answered two interview questions affirmatively. Second, supportive adult familial connections were defined by how youth characterized individual family relationships (all adult family members, parents) during a family genogram exercise. We separately compared gun assault and non-gun assault cases to controls using conditional logistic regression, stratified by prior violence involvement and adjusted for individual and contextual confounders.

Results: We enrolled 135 gun assault victims, 194 non-gun assault victims, and 274 controls. Participants were predominantly African American (95%). Positive adult connection was common in all groups (86% of controls, 86% of gun assault-injured cases, 92% of non-gun assault-injured cases). 33% of controls, 41% of gun-assault cases, and 34% of non-gun assault cases reported high prior violence involvement. There were no significant associations between positive adult connection and either gunshot or non-gun assault injury among youth with high prior violence involvement (GSW OR=2.46,p=0.11;Non-gun OR=1.59,p=0.40) or low prior violence involvement (GSW OR=0.92,p=0.86;Non-gun OR=1.96,p=0.18). In contrast, among youth with high levels of prior violence involvement, reporting at least one supportive adult family member in the family genogram was associated with higher odds of gunshot assault injury (OR=4.01,p=0.01) and non-gun assault injury (OR=4.22,p=0.01). Also, in youth with high prior violence involvement, reporting supportive parents in the family genogram yielded significant direct associations between supportive parents and gunshot assault injury (OR 3.00,p=0.05) and non-gun assault injury (OR 2.86,p=0.05). Among youth with low prior violence involvement, there were no significant associations between reporting supportive relationships with adult family members or parents in family genograms and the odds of gunshot assault injury or non-gun assault injury.

Conclusions: We were unable to demonstrate that positive adult connections protected youth from assault injury in this highly under-resourced environment. However, at the time of injury, assault-injured youth, particularly those with high prior violence involvement, reported high levels of adult connection and family support. We hypothesize that injury triggered families' focused attention and protective mechanisms which enhanced these youths' sense of family connection. This suggests that the post-injury period presents a critical opportunity for intervention resources to recognize, enhance, and sustain these connections in efforts to explore how they can better safeguard youth.

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SCREENING ADOLESCENTS AND YOUNG ADULTS FOR HIV IN THE UNITED STATES: A COST-EFFECTIVENESS ANALYSIS

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Purpose: Of new HIV diagnoses in the US, 22% occur in adolescents and young adults (AYA) aged 13-24. Despite 2006 CDC guidelines for one-time HIV screening, few AYA are screened. We projected the clinical impact, cost, and cost-effectiveness of HIV screening for US AYA without identified HIV risk factors.

Methods: We simulated a cohort of HIV-uninfected 12 year-olds in the US who faced age-specific risks of HIV infection, ranging between 0.6 and 71.3 per 100,000 person-years, peaking at age 24. We examined a one-time screen ($36) at age 15, 18, 21, 25, or 30, each in addition to current US screening practices (13% ever screened by age 18, 30% by age 24). We used published data on the HIV care continuum: screen acceptance (80%); linkage to care and antiretroviral therapy (ART) initiation (76%); and disease progression; ART response; and HIV care costs. Model outcomes included mean CD4 count at diagnosis; HIV continuum of care outcomes (proportions HIV-diagnosed, linked to care, retained in care, and virally suppressed), life expectancy and per-person lifetime costs; and incremental cost-effectiveness ratios (ICERs) in $/year of life saved (YLS). In sensitivity analyses, we varied HIV incidence, current practice screening rates, linkage rates, and screen cost.

Results: All one-time screens detected only a small proportion (0.1-10.3%) of lifetime infections, most of which occurred after age 24. An additional one-time screen at age 25 provided the greatest clinical benefit. Compared to current US screening practice, one-time screening at 25 only modestly reduced the proportions of all HIV-infected persons (regardless of age of infection) diagnosed after opportunistic infection (35% versus 39%) and never diagnosed during their lifetime (11% versus 12%). Screening at 25 also led to the most favorable continuum of care outcomes at age 25, compared to current US screening practice, for proportion diagnosed (77% versus 51%), linked to care (71% versus 50%), retained in care

(61% versus 34%) and virally suppressed (49% versus 32%). Screening at 25 led to the longest life expectancy and was cost-effective (ICER $61,900/YLS) by US standards (<$100,000/YLS) compared to the next most effective screen. In sensitivity analyses, this finding was robust to wide ranges of HIV incidence, current practice screening rates, linkage rates, and screen cost; it was most sensitive to peak age of incidence.

Conclusions: For AYA in the US general population, a one-time routine HIV screen at age 25, after the peak of incidence, will optimize clinical outcomes and be cost-effective. Screening at or before age 18 is a less efficient use of a one-time screen among AYA without identified HIV risk factors.

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EPIDEMIOLOGIC TRENDS IN NON-VACCINE-TYPE HPV AFTER VACCINE INTRODUCTION: NO EVIDENCE FOR TYPE REPLACEMENT BUT EVIDENCE FOR CROSS-PROTECTION

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Purpose: The introduction of HPV vaccines has led to a substantial decline in the prevalence of vaccine-type HPV in community settings. However, the impact of vaccination on non-vaccine-type HPV is not well understood. An absolute increase in non-vaccine HPV types after vaccine introduction may suggest type replacement (gradual elimination of vaccine-type HPV creating an ecological niche other types could occupy) which could adversely affect vaccine effectiveness. Conversely, a decrease in non-vaccine HPV types that are genetically related to vaccine-type HPV suggests cross-protection, which would enhance vaccine effectiveness. Our objective was to examine trends in non-vaccine-type HPV prevalence in a community during the eight years after vaccine introduction.

Methods: Three cross-sectional HPV surveillance studies were conducted in 2006-2007 (N=371), 2009-2010 (N=409) and 2013-2014 (N=400). Participants were sexually active 13-26 year-old young women who completed a survey and underwent cervicovaginal HPV DNA testing. We determined trends in non-vaccine-type HPV prevalence across the three waves, using logistic regression with propensity score inverse probability weighting (IPW) to balance differences in participant characteristics across waves. Outcome variables were: 1) prevalence of all 28 non-vaccine-type HPVs and 2) prevalence of HPV types genetically related to HPV16 (HPV31, 33, 35, 52, 58, 67) and HPV18 (HPV39, 45, 59, 68, 70).

Results: Vaccination rates increased from 0% to 71.3% across the three waves. Logistic regression models with IPW demonstrated that from waves 1 to 3, there was no significant increase in non-vaccine-type HPV among all women (AOR 1.17, 95% CI 0.87-1.58) or vaccinated women (AOR 1.02, 95% CI 0.73-

1.42), but there was a significant increase among unvaccinated women (AOR 1.88, 95% CI 1.16-3.04). Conversely, from waves 1 to 3, there was a significant decrease in HPV types genetically related to HPV16 among all women (AOR 0.62, 95% CI 0.43-0.90) and vaccinated women (AOR 0.57, 95% CI 0.38-0.88) but not among unvaccinated women (AOR 1.33, 95% CI 0.81-2.17). Genetically-related types decreased 36.1% among vaccinated women. There was no decrease from waves 1 to 3 in HPV types genetically related to HPV18.

Conclusions: We did not find evidence of type replacement in this community. However, the decrease in the prevalence of HPV types genetically related to HPV16 among vaccinated (but not unvaccinated) women suggests cross-protection against these types.

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GROUP-BASED TRAJECTORIES OF PARENTAL MONITORING COMPONENTS BETWEEN SEXUAL MINORITY AND HETEROSEXUAL GIRLS AND THEIR ASSOCIATIONS WITH SUBSTANCE USE

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Purpose: Sexual minority girls (SMGs, girls who identify as lesbian or bisexual, have same sex attractions, or have same sex partners) are at high risk for substance use. Parental monitoring, a set of behaviors that allows parents to be aware of their child's whereabouts and behaviors, may mitigate this risk, but studies indicate that it may operate differently for SMGs than for heterosexual girls. Previous studies have demonstrated that parental monitoring changes over time differently for SMGs compared to heterosexual girls. These models assume that all SMGs follow the same trajectory. However, there may be parental monitoring trajectories that are associated with reduced substance use compared to other trajectories. The purpose of this study is to identify those trajectories and to determine if SMGs tend to belong to less protective trajectories.

Methods: This is a secondary data analysis of the Pittsburgh Girls Study, a longitudinal study of a large, urban community sample of 2,457 preadolescent girls that track behavior changes over time. About 17% of the sample were SMGs (by identity, attraction, or behavior). This analysis used data from both SMGs and heterosexual girls starting at age 12 and followed for 5 years. We used growth mixture models to generate group trajectories of two parental monitoring components: (a) adolescent disclosure and (b) parental knowledge. We next used logistic regression models to test the association between group membership and substance use indicators at age 17 (alcohol use, cigarette smoking, or marijuana use) and to calculate the likelihood a SMG would belong to a group trajectory.

Results: We identified three group trajectories for adolescent disclosure: (a) rapidly decreasing, (b) linear increasing, and (c) high stable. Members of the high stable group were less likely to smoke cigarettes compared to the other two groups (OR 0.61, CI: 0.41, 0.92). Additionally, SMGs were more likely than were heterosexual girls to belong to the rapidly decreasing group (OR 1.54, CI: 1.02, 2.29) and

less likely to belong to the high stable group (OR 0.70, CI: 0.54, 0.90). We also identified three group trajectories for parental knowledge: (a) low and rapidly decreasing, (b) high and rapidly decreasing, and (c) rapidly increasing. Belonging to the rapidly increasing group compared to the other groups was associated with a reduced likelihood of drinking alcohol (OR 0.48, CI: 0.38, 0.61), smoking cigarettes (OR 0.43, CI: 0.33, 0.57), and marijuana use (OR 0.40, CI: 0.31, 0.51) at age 17. SMGs compared to heterosexual girls were more likely to belong to the low and rapidly decreasing group (OR 1.62, CI: 1.27, 2.07) and less likely to belong to the rapidly increasing group (OR 0.58, CI: 0.44, 0.75).

Conclusions: High adolescent disclosure and perceived parental knowledge trajectories appear to be more protective against substance use. Additionally, SMGs were less likely to belong to these protective groups. Future studies should examine why SMGs tend to disclose less to their parents and perceive that their parents know less about them over time. Addressing those reasons may inform interventions to reduce substance use in this vulnerable population.

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SOCIAL RELATIONSHIPS AND ASSOCIATED HEALTH EFFECTS AMONG ADOLESCENTS WITH AND WITHOUT CHRONIC MEDICAL CONDITIONS

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Purpose: Social relationships have been shown to exert short- and long-term effects on health; while these effects often emerge in childhood, extra-familial relationships become increasingly important, and dynamic, in adolescence. As youth with chronic conditions (YCC) may struggle with behavior and adjustment problems or activity limitations that inhibit their social engagement, their social relationships may suffer, contributing to poor health. We sought to quantify disparities in various domains of peer relationships for YCC compared to their healthy peers, and evaluate how each domain contributes to subsequent health.

Methods: Data are from 2721 adolescents (ages 8-19 years) interviewed for the 2002 and/or 2007 Child Development Supplement of the Panel Study of Income Dynamics, a nationally representative survey. We utilized multivariate-adjusted generalized linear mixed models to assess the relationship between having a chronic condition and each of seven scales measuring various domains of social relationships. Models included natural cubic splines (to model non-linear effects of age) and evaluated interactions between splines for age and chronic conditions to determine if age-trends differed for YCC compared to their healthy peers.

Results: Compared to their healthy peers, YCC (58% of sample) reported experiencing significantly more bullying (mean:1.46 vs 1.34, p<0.01), less closeness to friends (mean:2.59 vs 2.66, p=0.01), greater negative peer influence (e.g., friends encouraged them to disobey their parents; mean:1.55 vs 1.46, p<0.01), and lower best-friend relationship quality (mean:2.50 vs. 2.59, p<0.01); these disparities persisted after adjustment for confounders. Adjusted analyses revealed non-linear age-trends in closeness to friends, negative peer influence, and best-friend relationship quality; however, bullying was shown to decrease linearly with age, with YCC reporting significantly higher levels of bullying across all

ages (β=0.15, p<0.01). YCC reported similar closeness to friends at younger ages yet disparities appeared in middle adolescence (e.g., predicted scores: 2.58 vs 2.61 at age 13; 2.71 vs 2.86 at age 16). YCC had consistently higher levels of negative peer influence (β=0.06, p=0.03), peaking around age 17. Disparities in relationship quality diminished in middle adolescence for YCC (e.g., 2.46 vs 2.56 at age 13; 2.52 vs 2.54 at age 16). YCC experienced worse general health than their healthy peers (fair/poor: 9.7% vs 5.1%, p<0.01); this difference remained statistically significant after adjustment for sociodemographics and peer relationships. Bullying (OR:1.32, 95%CI:1.12-1.55) was associated with worse subsequent health among younger children, while positive peer influence (OR:0.82, 95%CI:0.68-0.99) and best-friend relationship quality (OR:0.67, 95%CI:0.47-0.96) were associated with better subsequent health among older adolescents.

Conclusions: Compared to their healthy adolescent peers, YCC report experiencing poorer social relationships and more bullying. Reports of poor social relationships contribute to worse future health, while reports of strong social relationships contribute to better future health. It may be important for providers to assess social well-being as part of overall health, both to better understand disease burden and to improve health outcomes; yet, additional work is needed to benchmark these measures against clinical metrics to guide clinician evaluation and interpretation of social health.