

Conclusion: Among a nationally representative sample of U.S. adolescents, we found a dose-response association between VOC and cardiometabolic dysfunction. This association was driven by high poverty areas, no association was observed in low poverty areas.

Infectious Disease

Association of neighborhood characteristics with pertussis diagnosis in a retrospective cohort of children born in Philadelphia, Pennsylvania



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Purpose: For decades, Hispanic/Latino infants have experienced higher rates of pertussis than infants from other racial/ethnic groups, yet evidence to explain this disparity is inconclusive. Sociodemographic disparities in pertussis vaccination coverage and delay have also been recognized. Understanding contextual risk factors may provide insights into the mechanisms underlying observed disparities. We investigate neighborhood-level, individual-level, and cross-level effects on disease risk to optimize immunization program outreach. We hypothesize that neighborhood-level characteristics will be associated with pertussis diagnosis.

Methods: A retrospective cohort study of children born January 1, 2010–December 31, 2017 was conducted to evaluate the association between neighborhood disadvantage score and percent Hispanic/Latino residents, and the dependent variable of pertussis diagnosis. We utilized generalized estimating equations accounting for correlated neighborhood-level errors to estimate the adjusted odds of pertussis. Covariates included child, maternal, and neighborhood characteristics. We evaluated pre-specified neighborhood- by individual-level interactions.

Results: Among 174,986 children, there were 235 pertussis cases. We detected an association between neighborhood disadvantage and pertussis in bivariable models (OR=1.15; 95% CI 1.01–1.30), but we did not observe an association in multivariable models adjusting for child and maternal sociodemographic characteristics and child vaccination status (aOR=0.83; 95% CI 0.59–1.17). We did not detect an association between neighborhood-level percent Hispanic/Latino residents and pertussis (OR=1.00; 95% CI 0.99–1.01), nor did we observe cross-level interactions.

Conclusion: Child and maternal characteristics were the primary drivers of pertussis in our cohort, suggesting neighborhood characteristics are not predictive of disease. Future work should continue to investigate the Hispanic/Latino disparity to inform immunization program planning.

Real world incidence estimation methodologies used for surveillance of HIV in repeat blood donors



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Purpose: Retrospective incidence estimates (IR) for transfusion-transmitted infections (TTI) in repeat blood donors is a standard method to assess safety of the blood supply and often influences policy decisions. These rates should be comparable across jurisdictions, but epidemiologists within the blood community have adapted traditional IR calculation methods in multiple ways to address challenges of measuring IR where there is no control over the time of donor presentations. Caution must be taken when comparing study results if different IR methods were used. Here we evaluate HIV IR using two common methods.

Methods: In the “Conventional” method (CM), a donor contributes to person-time if at least two blood donations exist within a specified estimation interval (EI). With the “Extended Lookback” method (ELM), the history of each repeat donor is traced back the same length of time as the EI to look for prior negative donations; their previous negative can occur before the EI.

Results: While ELM captures more incident donors than CM (n=398 versus n=225) during this 12-year study, we see no appreciable differences in IR between the two Methods.

Both show a significant decreasing trend in HIV IR (CM: $R^2=0.85$, $p=0.01$; ELM: $R^2=0.74$, $p=0.03$).

Conclusions: Estimating TTI incidence in blood donor populations is uniquely challenging. Though the estimates from these two methods were approximately equal, there are other methods in use. When choosing a preferred method, it is important to apply various methods to real data to identify possible bias that may influence real-world policy.

The effect of neighborhood concentrated disadvantage on the association between hospital-associated infections and survival in people living with HIV



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Purpose: Louisiana has an overwhelmingly large number of neighborhoods with high concentrated disadvantage (CDI), which may be affecting the number of hospital-associated infections (HAIs) and the mortality among people living with HIV (PLWH). This study aimed to determine the association between HAIs and mortality in PLWH while considering the potential confounding effects of neighborhood CDI.

Methods: This retrospective cohort study used the 7,207 records of the PLWH patients in the Louisiana Hospital Inpatient Discharge Database (LAHIDD) from 2011–2015. The main exposure was diagnosis with a HAI during their hospital stay, the main confounder of interest was neighborhood CDI and the main outcome was vital status by the end of the study period. The data was analyzed using generalized linear mixed models with a binary distribution and a random intercept, Cox proportional hazards mixed models, and geographically weighted least squares regressions.

Results: Results of the any-cause of death model showed that the factor most strongly associated with death was having a comorbidity (OR=4.51; CI:3.14, 6.49). The cause of death model predicting HIV-associated mortality indicated that CDI displays a stronger and significant effect on HIV-associated mortality (OR=1.18; CI:1.05, 1.33). The spatial mapping indicated that a greater number of deaths were occurring in census tracts with higher levels of disadvantage. The spatial regressions showed that an increase in HAIs results in a significant increase in deaths in any given census tract (0.83; CI:0.45, 1.20).

Conclusions: Although HAIs are not statistically significant in the mixed models, higher CDI is significantly associated with HIV-associated mortality.

Patterns of consistent retention in HIV care and viral suppression among cis-gender women living with HIV in Florida, 2014–2017: a latent class analysis



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Purpose: The objective was to identify patterns of consistent retention in HIV care and viral suppression among women newly diagnosed with HIV and factors associated with these patterns.

Methods: Surveillance data from the Florida Department of Health’s electronic HIV/AIDS Reporting System on women diagnosed with HIV in 2014 and living in Florida through 2017, were retrospectively analyzed. Latent class analysis was used to classify women by patterns of change in retention in HIV care (greater than or equal to 2 HIV care visits at least 3 months apart) and viral suppression (less than or equal to 200 copies/ml) over three years. Multinomial regression was used to examine factors associated with class memberships.

Results: Data from 809 women were analyzed. Four classes were selected based on model fit parameters: (Class 1) consistently retained and suppressed (greater than 90% probability of being retained and suppressed), (Class 2) not consistently retained or suppressed (less than 20% probability of

being retained and suppressed), (Class 3) increasingly retained and suppressed, and (Class 4) decreasingly retained and suppressed. The proportion of women in each class was 54%, 18%, 15%, and 13%, respectively. Higher odds of belonging to Class 3 was observed among ages 13–24 (adjusted Odds Ratio-1.89; 95% Confidence Interval-1.07–3.30), history of injection drug use (4.06; 1.95–8.41), US-born (1.62; 1.10–2.38), having an AIDS diagnosis (1.74; 1.13–2.68), and non-linkage to care 3-months post-diagnosis (3.46; 1.96–6.09), compared to Class 1.

Conclusion: These patterns should be considered in tailoring interventions to improve retention in HIV care outcomes.

Syphilis surveillance in Fulton County, GA 2013–2015: selective participation in case interviews and implications for control efforts



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Purpose: Fulton County, Georgia ranks third nationally for syphilis rates. Disease Intervention Specialists interview case-patients for risk factor and partner information, and have noted that interviewees differ from non-interviewees, with implications for data interpretation and syphilis control. We describe factors associated with interview completion.

Methods: Using surveillance data, we identified primary and secondary syphilis cases in Fulton County with a first diagnosis in 2013–2015. The distribution of demographic (age, sex, race) and clinical (syphilis, gonorrhea, chlamydia, and HIV status) characteristics were compared between those interviewed and not interviewed using chi-squared tests for proportions and t-tests for means.

Results: There were 1,067 first syphilis diagnoses. Overall, the mean age was 32 years (SD=9.8), 94.5% were male, 73.9% were black; 4.9% and 3.8%, respectively, had recent gonorrhea and chlamydia infections, 55.1% were HIV-positive, and 12.2% had a repeat syphilis infection within 2 years. Compared to non-interviewees (n=369), interviewees (n=698) were younger (mean age: 31 vs. 34 years, $p<0.001$), and more likely to be female (7.0% vs. 2.7%, $p=0.003$) and black (78.7% vs. 64.8%, $p<0.001$). Interviewees were less likely to have a recent chlamydia diagnosis (2.7% vs. 5.7%, $p=0.015$). Proportions with gonorrhea (5.4% vs. 3.8%, $p=0.234$), repeat syphilis infection (11.3% vs. 13.8%, $p=0.235$ all men), and HIV (55.0% vs. 55.3%, $p=0.932$) were similar.

Conclusions: Interviewees differed notably from non-interviewees. While men comprised the majority of cases—including all repeat infections—they were less likely to interview. We encourage other health departments to conduct similar assessments to improve interview participation by high-risk patients.

Prevalence of *Escherichia coli*, *Salmonella*, and *Campylobacter* spp. on retail chicken, turkey, pork, and beef in the United States: a literature review



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Purpose: *Escherichia coli* (*E. coli*), *Salmonella*, and *Campylobacter* species are common bacteria that contaminate animal meats and cause human food-borne illnesses in the United States. This literature review summarizes and compares studies and federal reports to provide an overview of existing research of bacterial prevalence on retail meat in the U.S.

Methods: We selected articles on PubMed, MEDLINE, Elsevier, Ovid, Cochrane Library, and Google Scholar that reported the prevalence of *E. coli*, *Salmonella*, and *Campylobacter* spp. on fresh retail chicken, turkey, pork, and beef in the U.S. We compared prevalence estimates to those published by the National Antibiotic Resistance Monitoring System (NARMS).

Results: Twenty-six articles published between 1983–2018 were included in this study. On poultry meat, the pooled *E. coli* prevalence was 26.7% (95% CI: 25.5–27.8%) and *Campylobacter* was 38.9% (95% CI: 35.9–41.9%). *Campylobacter* prevalence was lower for pork (0.37%; 95% CI: 0.23–0.51%) and beef

(1.3%; 95% CI: 0.05–0.20%). *Salmonella* prevalence was low on beef (0.69%; 95% CI: 0.39–0.98%) and pork (4.7%; 95% CI: 3.14–6.3%), which was roughly consistent with the NARMS range of 0.5–2.1%. Studies differed in collection and laboratory methods, such as utilizing culture and/or amplification techniques.

Conclusion: This is the first extensive comparison of studies that delineates bacterial prevalence on retail meat across the U.S. These findings build upon growing public health concerns regarding food safety, environmental practices, and food animal ethics that may help in developing future policy interventions. Furthermore, our paper advances the field by facilitating access to information comparing various articles for future studies.

National estimates of antibiotic availability for treatment of gonorrhea and primary and secondary syphilis in US physician offices



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Purpose: Reported cases of gonorrhea and primary and secondary syphilis are on the rise. Recommended treatments for uncomplicated gonorrhea and primary and secondary syphilis include two injectable medications, Ceftriaxone 250 mg IM, and Penicillin G benzathine (Bicillin L-A®) 2.4 million units IM, respectively which should be readily accessible for point of care treatment.

Methods: The 2016 National Ambulatory Medical Care Survey (NAMCS) was used to identify physicians who regularly evaluate and treat patients for sexually transmitted infections (STI) in their practice, and the on-site availability of Ceftriaxone and “bicillin” in their offices. Percentage estimates of drug availability were reported and multiple logistic regression models were used to determine office characteristics that were predictive of no availability of these medications.

Results: An estimated 45.2% (149,483; 95% CI 138,850 – 160,116) of the weighted office-based physicians indicated that they evaluate patients for STIs in their office. Of those, 77.9%, (116,479; 95% CI 105,360–127,598), and 56.1% (83,827; 95% CI 73,709 – 93,945) indicated that they do not have bicillin and Ceftriaxone on site, respectively. Physicians were more likely to report lacking on-site access to both Ceftriaxone (2.03 OR; 95% CI 1.15 – 3.57) and bicillin (3.20 OR; 95% CI 1.63–6.29) if the office was not designated as a Patient Centered Medical Home (PCMH) compared to physicians in offices that were designated as a PCMH.

Conclusion: These nationally-representative analyses demonstrate that the majority of physicians who provide STI services do not have on-site access to medications recommended for the treatment of gonorrhea and syphilis.

Injury and Substance Use

Rheumatoid arthritis, osteoporosis screening, and fracture



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Purpose: Rheumatoid arthritis (RA) is a systemic autoimmune disease affecting the joints. RA and its treatment with steroids can induce bone loss, making screening for osteoporosis important. Within a cohort of patients with RA, we evaluated predictors associated with osteoporosis screening by dual-energy x-ray absorptiometry, described the distribution of osteopenia/osteoporosis in the screened population, and assessed predictors of fracture.

Methods: This retrospective cohort study conducted within Kaiser Permanente Southern California included enrollees aged ≥ 50 years with ≥ 1 RA diagnosis code during 2008–2017. Predictors obtained from the electronic health record included age at cohort entry, sex, race/ethnicity, body mass index (BMI), height, weight, screening results, fracture outcomes, and use of RA medications and steroids. Cox proportional hazards models were used to estimate the associations between predictors and screening, osteopenia/osteoporosis diagnoses, and fracture.

Results: Of 26,921 patients identified with RA, 16,209 patients (60.2%) had their first DXA scan after cohort entry. Asians were more likely to have been screened (HR 1.2; CI: 1.1–1.3) and diagnosed with osteoporosis (HR 1.6; 95%