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HIV Risk, Prevention and Intervention Among Criminal Justice involved Black men who have sex with men: A Systematic Review

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Methods: Chart reviews were done for 95 out of 149 Tuberculosis cases diagnosed in Shelby County, Tennessee from 2013 to 2015. These case's self-identified contacts and other contacts identified were abstracted using a standardized chart abstraction tool and organized in a dataset of $n=1,327$. Statistical analysis was done to identify the proportion of contacts were offered preventive treatment, proportion that completed treatment and determinants of whether adequate preventive therapy measures were taken. **Results:** It is estimated that for every 100 people who went through preventive therapy, 1.5 cases of Tuberculosis may be prevented. Approximately 15% of the Tuberculosis cases in Shelby County for this study had been named as contacts of previous cases meaning that they represent missed opportunities for prevention. Preventive therapy using 3HP had a completion rate of 67%; a 20% higher completion rate than standard INH therapy. **Conclusions:** There is a need for a more rigorous approach of preventive therapy in Shelby County, Tennessee. The use of 3HP is a dramatic new opportunity for treatment of latent Tuberculosis infection to prevent developing Tuberculosis disease. Based on analysis, there is chance to reduce the Shelby County Tuberculosis epidemic by at least 15% annually if we ensure adequate preventive therapy with 3HP for every contact at risk. Results from this study can be used by the Tuberculosis Elimination Program at the Shelby County Health Department to decrease Tuberculosis incidence in Shelby County.

P63. Healthy People 2020 Sexually Transmitted Diseases Objectives: Progress towards National Targets and Elimination of Disparities



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Purpose: Healthy People is a national initiative to promote health and reduce disease through the setting and tracking of objectives and targets. One of the four overarching goals of Healthy People 2020 (HP2020) the latest iteration, calls for achieving health equity, eliminating health disparities, and improving the health of all population groups.

HP2020 is composed of approximately 1,300 objectives organized into 42 topic areas. The HP2020 Sexually Transmitted Diseases (STD) topic area contains 18 objectives, 14 of which have national targets, 3 with no national baseline value and target, and 1 of which has been archived.

Methods: An evaluation of progress towards the HP2020 STD objectives targets and towards eliminating disparities among population-based STD objectives was conducted. For objectives moving towards targets, progress was measured using the percentage of targeted change achieved. For objectives moving away from their targets, the magnitude of the percent change from baseline was used to measure movement.

Disparities were assessed among population groups within specified demographic characteristics. Most favorable and least favorable group rates were identified and summary disparity ratios for selected characteristics were calculated.

Results: The evaluation of progress towards the targets shows that 14.3% of the 14 objectives with tracking data have met/exceeded their targets, 28.6% are moving towards their targets, 28.6% were moving in the wrong direction, and 28.6% showed little or no detectable change.

The evaluation of disparities shows that disparities persist across racial/ethnic groups, sex, education, income, disability, and geographic location. Asians and White, non-Hispanics had the most favorable rates among racial/ethnic groups, for example.

Conclusions: The assessment of Healthy People STD progress and disparities show that progress in meeting targets is mixed and that disparities persist.

P64. CDC's Zika Response — Role of Epidemic Intelligence Service Officers in 2016–2017



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Purpose: The Epidemic Intelligence Service (EIS) is CDC's 2-year post-graduate fellowship in applied epidemiology. Since 1951, EIS officers have supported CDC's mission by deploying rapidly in response to outbreaks and public health emergencies, such as Reye's syndrome, toxic shock syndrome, HIV/AIDS, H1N1, and Ebola. During the past 2 years, CDC has been part of a

coordinated, global response effort to support response activities related to the ongoing Zika virus (Zika) outbreak. Zika raised international concern recently as the number and geographic distribution of cases increased and evidence of increased birth defects and Guillain-Barre Syndrome (GBS) emerged. As an example of how EIS officers contribute to CDC's large-scale deployments, we document and describe EIS officers' contributions to Zika response activities.

Methods: We reviewed CDC response records from January 2016 to April 2017 to identify EIS officers who deployed for Zika-related response investigations to determine number, duration, and geographic location of deployments. Preliminary reports were reviewed to identify initial outcomes and impact of deployments.

Results: Between January 2016 and April 2017, 70 of 229 EIS officers from EIS classes 2014, 2015 and 2016, participated in 99 Zika deployments to 8 countries, 7 states, 2 U.S. territories, and CDC's Emergency Operations Center. EIS officers were among the first to deploy and lead Zika-related investigations and contributed 2,812 total days (nearly 8 years) to the Zika response. These deployments contributed to establishing surveillance for GBS and Zika, characterizing the epidemic, identifying risk factors, enhancing prevention and control efforts, and developing clinical guidance and recommendations.

Conclusion: Although EIS officers represent a small amount of CDC's deployable workforce, they contributed substantially to CDC's Zika response activities and investigations that have enhanced our understanding of the epidemiology and risk factors for Zika virus infection. EIS officers are an integral component of CDC's front-line public health responders.

P65. Predicting Pneumonia in Acute Stroke Patients Using the Glasgow Coma Scale Score



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Purpose: In stroke patients, the Glasgow Coma Scale (GCS) is utilized to assess consciousness and brain injury. In this analysis, we aim to determine if GCS score at presentation predicts post-stroke pneumonia and mortality.

Methods: Data of 9792 acute stroke patients extracted from the National Neurology Registry of Malaysia were analyzed. Severity of post-stroke brain injury was categorized as severe, moderate or minor based of GCS score of 8 and less, 9 to 12 and 13 and greater, respectively. Logistic regression was used to assess the association between post-stroke brain injury with pneumonia and post-stroke mortality. All models were adjusted for age, gender, marital status, education level, race, stroke type and stroke severity.

Results: Mean age of participants was 62.5 ± 12.6 years, 45.9% ($n=4444$) were females, 86.1% ($n=8429$) were married and 50.2% ($n=4915$) had 6 or less years of formal education. 21.0% ($n=2059$) individuals had recurrent stroke and 73.7% ($n=7219$) of the strokes were ischemic strokes. Individuals categorized with lower GCS score and thus more severe brain injury had a higher likelihood of developing post-stroke pneumonia after adjusting for potential confounders (OR 3.31; 95% CI 2.74-3.99, $p<0.01$). Similarly, individuals with lower GCS score had a higher likelihood of post-stroke mortality (OR 6.35; 95% CI 5.29-7.64, $p<0.01$).

Conclusion: In our analysis, we find that Glasgow Coma Scale assessment at initial patient presentation predicts development of pneumonia in acute stroke patients. This finding supports the importance of evaluating the GCS score at initial patient presentation in post-stroke patient management.

P66. HIV Risk, Prevention and Intervention Among Criminal Justice Involved Black men who have sex with men: A Systematic Review



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Disproportionate detention of young Black men has a significant impact on their health and well-being and that of their communities and sexual partners. A sub-group of young Black men with criminal justice involvement (CJI)

identify as gay, bisexual, or are non-identified men who have sex with men (hereafter MSM). According to the CDC, Black MSM, with and without, CJI experience HIV incidences that exceed any other race/transmission group in the US. This systematic review focuses interventions that address epidemiologic risk factors associated with HIV and sexually transmitted infection (STI) in CJI populations and their potential relevance to Black MSM with CJI. We conducted electronic searches of Medline, PsycINFO, CINAHL, and the Cochrane Review of Clinical Trials databases. Studies published before January 1, 2017 that included over 30 Black men, HIV or STI as an outcome measure, and participants who were arrested, detained, or on parole/probation were included. Reviewers independently and systematically extracted and reviewed all studies using Downs and Black checklist for intervention studies. Authors cross-checked 20% of extractions for consistency, and used PRISMA guidelines for reporting findings. A total of 40 studies were included in the final analysis. Reporting on MSM as a distinct population was evident in just 36% of studies and subgroup analyses specific to Black MSM was rare. Interventions included HIV/STI education and screening, condom provision, linkage to HIV care and treatment, and mental health and substance misuse interventions. None of the interventions included biomedical HIV prevention (e.g., pre-exposure prophylaxis) beyond treatment as prevention. This analysis identifies both promising interventions for widescale adoption and key gaps in research on at-risk and HIV-infected CJI populations. Future research in CJI populations should allow for detailed subgroup analyses of Black MSM so that the effects on key health and social outcomes relevant to this highly impacted population are carefully assessed.

P67. Assessing Risk of Influenza Infection on a College Campus: An Emphasis on Housing Arrangement



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Background: Each year, millions of cases of influenza are reported in the United States. The virus can spread rapidly on college campuses, partially due to housing arrangements and social activities. The purpose of this study was to determine if housing arrangements were associated with increased influenza or influenza-like-illnesses (ILIs) infection rates at Liberty University.

Methods: Electronic surveys were administered and completed by 405 undergraduate and graduate students during October 2016. Data were analyzed to identify relative risk and assess correlation between housing arrangements and student illness. Geographic Information System (GIS) maps were created to display flu vaccination prevalence and self-reported flu symptoms by housing arrangement and location.

Results: Of the 405 participants 182 (44.9%) reported having an illness with flu-like symptoms. The residential annex had the highest rate of self-reported flu symptoms (56%) and commuter students had the lowest (40%). Of those surveyed 51 (12.6%) had received the 2016–2017 flu vaccination. The highest percentage of flu vaccination was in the Residential Annex (22%) and lowest in the Quads (0%). Risk of illness increased slightly with shared living spaces: bedroom (RR=1.06), bathroom (RR=1.19), kitchens (RR=1.03), and common spaces (RR=1.06). A Chi Square Test for Independence revealed no statistically significant relationship between housing arrangement and reported student illness ($p=0.68$, $\alpha=0.05$). A second Chi Square Test for Independence was run to determine if a relationship existed between class status and reported illness; again, no statistically significant relationship was found ($p=0.16$, $\alpha=0.05$).

Conclusions: The findings suggest that housing type has no statistically significant effect on the development of ILIs. Influenza vaccination rates were lower than the national average. However, they were still found to be a protective factor. Further studies should be conducted to better understanding how other risk factors contribute to influenza outbreaks on college campus and aid in development better public health interventions.

P68. Causal Variable Importance of Elixhauser Comorbidity Groups for In-hospital Mortality in Patients with Bloodstream Infection



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Purpose: The importance of the Elixhauser comorbidity system in patients who develop bloodstream infection (BSI) is uncertain. The purpose of this work was to quantify the contribution of Elixhauser comorbidity groups to in-hospital mortality in the population of patients who are diagnosed with BSI. **Methods:** We examined 4008 hospitalizations in 3495 patients (≥ 18 years old), who developed BSI at a 1250-bed tertiary-care center in St. Louis, Missouri, between 2011–2012. We identified a BSI case by a positive blood culture result with a known pathogen. We estimated a variable importance measure, population attributable fraction (AF_p), using targeted maximum likelihood estimation with super learning for a data-adaptive estimation of AF_p , which is defined as the fraction of all in-hospital mortality that would not have occurred if a specific comorbidity group had not existed.

Results: In-hospital mortality occurred in 16% of patients who developed BSI. Estimates of AF_p identified comorbidity groups that significantly contributed to in-hospital mortality after controlling for demographics and all other comorbidity groups, which included cardiac arrhythmias ($AF_p = 0.0259$), neurological disorders ($AF_p = 0.0195$), liver disease ($AF_p = 0.0247$), coagulopathy ($AF_p = 0.0185$), and fluid and electrolyte disorders ($AF_p = 0.0368$).

Conclusions: Several Elixhauser comorbidity groups are significantly contributing to in-hospital mortality in the population of patients diagnosed with BSI.

P69. Predicting Incidence of Norovirus Epidemiology in Oyster Harvesting Areas along Louisiana Gulf Coast



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Purpose: Tools for prediction of viral pathogens are crucial for securing the public health from risks of the associated illnesses. Norovirus (family Calciviridae) is the leading cause of epidemic gastroenteritis and outbreaks that frequently detected in oysters harvested from sewage-contaminated waters. A key priority in addressing the ongoing risk of norovirus outbreaks is identifying the environmental predictors and conditions controlling epidemics in coastal waters. The objective of this study is to apply machine learning techniques first to determine environmental factors governing outbreaks and then to develop prediction models for Louisiana Coast, which is highly prone to epidemics.

Method: Environmental data, along with various combinations of the explanatory variables were analyzed through Random Forests (RF) method to select final model input variables. The genetic programming (GP) algorithm was further used to predict norovirus outbreaks. Furthermore, the importance of the input variables to the model output was evaluated by global sensitivity analysis.

Result: Findings indicated that gage height, water temperature, and solar radiation were the most sensitive parameters influencing norovirus outbreaks, respectively. Moreover, GP managed successfully to predict norovirus outbreaks in the study area with the reasonable accuracy.

Conclusion: The machine learning approach, presented in this study, provided reliable tools for predicting potential norovirus outbreaks and preventing or at least reducing risks to the human health. This work contributes to the growing body of literature on norovirus epidemiology in terms of source, sink, and predictors.

Methods

P70. Peer-Reviewed Manuscript to Infographic: The Millennium Cohort Program's Method for Disseminating Evidence-Based Research



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Purpose: The Millennium Cohort Program, consisting of both the largest longitudinal cohort of U.S. Service members and a dyadic cohort of Service