| Thursday, November 1, 2018	
7:15 - 8:00am	Registration will be held in the Manchester Pre-Function (Lower/Garden Level)
8:00 - 8:15am Rockwell Room	**Welcoming Remarks** - Patsy Kelso, State Epidemiologist for Infectious Disease, Vermont Department of Health
8:15 - 9:30am Rockwell Room	**Plenary Session - 100 Years Since 1918: Are We Ready for the Next Pandemic?** - Carrie Reed, DSc, MPH, Team Lead, Applied Research and Modeling, Influenza Division, Centers for Disease Control and Prevention In 1918, a new influenza virus emerged causing a pandemic that killed an estimated 675,000 Americans and ~50 million people worldwide. The flu pandemic of 1918 infected an estimated 500 million people worldwide—about one-third of the world's population, causing the greatest influenza death total in recorded history. The vulnerability of healthy young adults and the lack of vaccines and treatments created an unprecedented public health crisis. The global engagement in World War I contributed to the transmission of virus through troop movement and crowding in military camps. Pandemic influenza illness was notable for the speed of disease, leading to high numbers of rapid onset pneumonia and death. Typically, seasonal influenza mortality is greatest among the youngest and oldest in a population. During the 1918 pandemic, the virus also affected young adults between 20 and 40 years of age. The average age of death was 28 years old. The world has had three other pandemics in the last 100 years caused by influenza viruses having less severe illness. CDC monitors avian and swine influenza viruses that infect people; if a new pandemic virus were to emerge with severe characteristics, the impact of that pandemic could be devastating. Improvements and innovations in preparedness and response to pandemics have been made in recent years; however, further advances in vaccines, antivirals, and supportive healthcare are needed to fully mitigate the impact of severe, 1918-like pandemic.

9:30 - 10:15am Rockwell Room	**Plenary Session - The Ecology of Emerging Tick-borne Diseases in a Changing World** - Richard S. Ostfeld, PhD, Distinguished Senior Scientist, Cary Institute of Ecosystem Studies
	Infectious diseases of humans are emerging at an accelerating pace. To what extent is this acceleration facilitated by anthropogenic environmental changes? In this presentation, Ostfeld will explore a set of principles that might apply broadly to emerging infectious diseases and will apply these principles to three tick-borne zoonoses (diseases transmitted from non-human vertebrates to people) that are highly prevalent in the temperate zone worldwide. He will demonstrate that the vertebrates responsible for disease transmission (the "reservoirs") are species, frequently rodents, that thrive when natural habitats are fragmented and biodiversity is lost. In contrast, the species that inhibit transmission are vulnerable to anthropogenic disturbances. As a result, risk and incidence of tick-borne diseases increase when vertebrate diversity declines. The status of small rodents as natural reservoirs for multiple tick-borne pathogens increases the rate at which tick acquire multiple infections (co-infections) and consequently the potential for people to be exposed to coinfection. Population size of these rodents increases following pulses of their food supply (acorns) and decreases where their predators (foxes and bobcats) are abundant. Considering ticks and their zoonotic pathogens as parts of forest food webs allows us to predict the places and times of high risk of human exposure. Accurate predictions in turn allow tick-control, educational, and other preventative measures to be targeted to high-risk situations. This body of ecological research suggests that understanding how pathogen-vector-host interactions are regulated in nature can help guide environmental policy to reduce risk as well as public health policy to prevent exposure.
10:15 - 10:30am	**Break in the Rockwell Foyer and Manchester Pre-Function (Lower/Garden Level)**

| 10:30 - 12:00pm	**Rockwell A/B** Maternal Child Health / Injury	10:30	**Epidemiology Overview from the Maine-Vermont Violent Death Reporting System, 2015-2016** - Marcella Sorg, Research Professor, University of Maine, Margaret Chase Smith Policy Center Co-Researchers: Jamie Wren, Caitlin Jelinek The bi-state Maine-Vermont Violent Death Reporting System covers two rural states with small populations and collects in-depth data on homicides, suicides, deaths of undetermined manner, and all firearm deaths. This presentation provides an overview of patterns covering 834 violent deaths that occurred in both states during 2015-2016. We will consider similarities and differences between the two states in the context of rural sociodemographic characteristics.
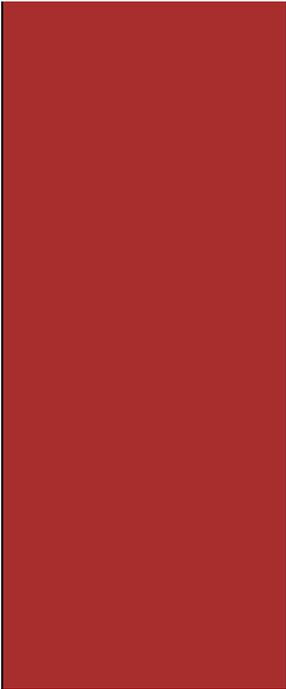
| 10:43 | **Epidemiological Profile of Suicides in Rural States of Northern New England, 2015-2016: Combining NVDRS Data for Maine, New Hampshire and Vermont** - Marcella Sorg, Research Professor, University of Maine, Margaret Chase Smith Policy Center
Co-Researchers: Djelloul Fourar-Laidi, Caitlin Jelinek, Jamie Wren

This presentation will profile the demographic and epidemiological characteristics of persons completing suicides in northern New England over the time period 2015-16. Maine, New Hampshire and Vermont are all rural states with older median ages than other states, as well as other sociocultural similarities, yet their small populations often limit statistical analysis of violent deaths. Aggregating the rich data from the Maine-Vermont Violent Death Reporting System and the New Hampshire Violent Death Reporting System provides a larger sample size and an opportunity for more analytical depth on rural suicides. Using this larger sample of 1156 suicide deaths (458 from Maine, 465 from New Hampshire, 233 from Vermont), we will take a closer look at suicides in general in the region, with more detail regarding elders and veterans specifically. |

10:56

Primary Care Providers' Screening and Management of Youth Depression and Suicidality in a Rural Northeastern State - Tom Delaney, Research Associate, Department of Pediatrics, Larner College of Medicine, Vermont Child Health Improvement Program, The University of Vermont
Co-Researchers: Alyssa Consigli, Barbara Frankowski, Eliot Nelson

Background. Young people in Vermont report high rates of depression and suicidality. Primary Care Providers (PCPs) are well positioned to screen for and initiate treatment (including making referrals) for these problems during office visits with youth. Recent healthcare improvement initiatives have focused on increasing depression and suicide screening by Vermont PCPs who see youth. However, actual screening practices of PCPs for these conditions is largely unknown. Similarly, how providers work with young people and their families to manage these conditions in Vermont primary care settings has not been described. Research Aims. We will present results from a survey conducted in two phases. In the first phase, we surveyed PCPs who were involved in a Quality Improvement (QI) initiative; in the second phase we expanded the target to include all family practice and pediatric providers in the state. The aims of the survey were to 1) characterize the current state of primary care practice in Vermont regarding detection and management of depression and suicide risk in adolescents, and 2) assess clinicians' perceptions of access to mental health care for their youth patients. Additional aims included examining the effects of practice type (family medicine versus pediatrics) and rural versus non rural practice sites. Methods. Surveys were sent by email to lists of pediatric and family medicine PCPs in Vermont. Follow-up emails were sent to non-responders. Data from both surveys were merged in order to present as complete a view of Vermont PCPs as possible. Data analyses were primarily descriptive and used SPSS. Results. 133 surveys were completed. 98% of PCPs involved in the QI initiative responded; the response rate for second (expanded) phase of the survey could not be reliably determined because of possible inaccuracies in the lists of email addresses for this group. Overall, 88% of PCPs reported always or usually screening for depression in health supervision visits with youth. Screening for suicide risk appeared to be less frequent (74%). A large majority of PCPs (72%) perceived access to Crisis Care Mental Health services as excellent or good – although there was a trend towards Family Medicine providers being less likely to report this than Pediatricians. In contrast to perceptions of crisis care, most (62%) clinicians perceived access to routine or follow-up mental health care services to be only fair or poor for their adolescent patients with depression. One question asked about training and support regarding depression and suicide screening and management, and 70% of respondents answered that this was a need. Comparing the responses of providers who practice in rural versus non-rural areas revealed trends towards increased rates of *regularly* screening for depression (98% versus 86%) and suicidality (85% versus 67%) in non-rural settings. A large majority (93%) of PCPs ask follow-up questions about suicide risk when patients screen positive for depression, and counseling on access to lethal means was usually (94%) performed when suicidality was detected. Conclusions. PCPs who care for youth report overall high rates of screening for depression but lower rates of screening for suicidality. Increased screening for these issues should lead to greater detection and (hopefully) initiation of treatment for young people. Evidence from earlier projects with PCPs suggests that screening practices can be increased as a result of participation
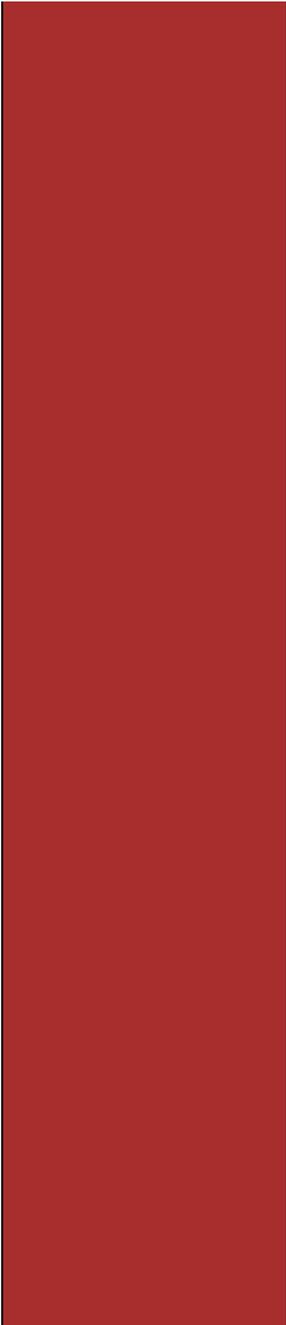
in collaborative QI projects that include screening for depression and suicidality as focus areas for improvement. Results from the current report suggest there is a need and a willingness among PCPs who care for youth to make improvements in their screening practices in these areas.

11:09

Suicidal Ideation, Self-directed Violence, and Accidental Poisoning among Vermont Youth and Young Adults - Laurin Kasehagen, MCH Epidemiologist, CDC Assignee to Vermont, CDC, Vermont Department of Health
Co-Researchers: Barbara Carroll, Tracy Dolan, Patsy Tassler Kelso, Alison Krompf, Laurel Omland, Julia Howland, Kristin Rankin, Charlan Kroelinger

Objectives. Although suicide is the third leading cause of death nationally among individuals 10-14 years and second among individuals 15-24 years, suicide attempts are more common with an estimated 100-200 suicide attempts occur for each suicide in these age groups. We used Vermont hospital emergency department (ED) data to estimate population rates of suicidal ideation, suicidal and undetermined self-directed violence (SDV), and accidental poisoning among Vermont residents aged 10-24 years. Methods. We identified International Classification of Diseases, Ninth and Tenth Revisions, Clinical Modification diagnosis and external-cause-of-injury codes for suicidal ideation, SDV, and accidental poisoning among ED visits of Vermonters aged 10-24 years. We conducted a descriptive analysis of Vermont Uniform Hospital Discharge Data Sets, and report rates and percentages of Vermonters with suicidal ideation, SDV, and accidental poisoning. We conducted Cochran-Armitage Trend Tests to assess changes across years. Results. During 2010-2016, there were 9,128 ED visits with any one or any combination of diagnosis codes for suicidal ideation, SDV, and accidental poisoning. Crude rates of suicidal ideation and SDV significantly increased from 236.9 to 333.8 (p<0.0001) and 208.6 to 345.1 (p<0.0001) per 100,000 individuals 10-24 years, respectively. Accidental poisoning rate changes were not statistically significant. Conclusions. The increases in suicidal ideation and SDV among Vermonters are a growing public health concern. The integration of behavioral health into primary and urgent care systems can support a public health framework and approach. Self-harming behaviors and self-destructive thoughts could be addressed, in part, through early identification, and development of coping skills.

11:22	**Using Maine and New Hampshire PCRs to Create a Gold Standard Injury Dataset in Agriculture, Forestry, and Fishing** - Erika Scott, Deputy Director, NEC, New York Center for Agricultural Medicine and Health (NYCAMH) / Bassett Healthcare Network Co-Researcher: Liane Hirabayashi

Background: Access to free text in existing administrative databases has proved useful in identifying and characterizing agricultural, forestry, and fishing (AFF) related injuries. Particularly, narratives from pre-hospital care reports (PCRs) provide specific details of the injury event directly from the scene and from interviewing the patient. These narratives, which are retained by a number of states, are systematically searched for AFF specific keywords and verified for AFF relatedness. The Occupational Injury and Illness Classification System (OIICS) is then applied to the dataset by a team of coders. To enhance this process, researchers are applying machine-learning methodologies to speed up text review and ultimately, reduce the cost of the surveillance system. Methods: This process described above has been applied to PCRs from Maine and New Hampshire for a three year period to create a confirmed injury dataset. Agriculture, forestry and fishing records were identified by industry, and by the certainty of the injury report (e.g. true case, suspected case). This dataset was further refined using stemmers and lemmatization in the Natural Language Toolkit. Results: Maine and New Hampshire had 882,580 pre-hospital care report records for 2008-2010. Of these, 28,341 contained one or more of 161 AFF keywords (searched either by character string or exact word). Of the keyword containing records, 1,203 were determined to be AFF related. Results of the stemming and lemmatization are currently being testing and will be presented at the conference. Conclusions: Pre-hospital care reports are a rich source of occupational injury data, especially for agriculture, forestry and fishing. These injuries are able to be identified and coded using the OIICS classification scheme, making them comparable to other industries. Pre-hospital care reports have the potential to be a useful source of research data, beyond AFF, but for other industries and for public health in general. Conclusions on the success of using varying methods to enhance coding of AFF cases will be discussed at the conference.

11:35   **Quality Improvement for Clinical Management of Pediatric Asthma in Primary Care** - Valerie Harder, Assistant Professor, Departments of Pediatrics and Psychiatry, UVM

Introduction. Pediatric asthma is a common, relapsing-remitting, chronic inflammatory airway disease that when uncontrolled often leads to substantial patient and health care system burden. Improving primary care office systems to manage asthma can help clinical management outcomes for patients with asthma. Methods. The Vermont Child Health Improvement Program (VCHIP) developed a maintenance of certification (MOC) quality improvement (QI) project to improve primary care office systems and supports for clinical management of pediatric patients with asthma. Seven months of medical record review data were submitted to VCHIP by physicians and evaluated for improvements on eight clinical asthma management measures. Pre and post office systems inventory (OSI) detailing adherence to improvement strategies were analyzed for improvement. Regressions were run to test for associations between OSI strategies and clinical asthma management measures at the end of the QI project. Results. This study found significant improvement from baseline to month seven on seven of the eight clinical asthma management measures, and between pre and post OSI for seven of the nine strategies assessed. Additionally, one point higher average scores on the asthma assessment and monitoring of asthma severity, asthma control, and asthma action plan OSI strategies were associated with significantly greater odds of their respective clinical asthma management measures being fulfilled. Conclusion. This seven month, practice-based, QI project on pediatric asthma suggested that office system improvements in primary care can impact the clinical management of pediatric asthma. Specifically, improving office systems around asthma documentation, assessment and control, and reviewing/updating an asthma action plan may yield measurable improvement on clinical management measures.

11:48

The Interplay of the Effect of Interpregnancy Interval and Previous Adverse Birth Outcomes on Subsequent Birth Outcomes - Angela Heisey, Research Scientist, New York Department of Health, Bureau of Women, Infant & Adolescent Health
Co-Researcher: Erica Stupp

Background: The literature shows that short interpregnancy intervals (IPI) of less than 18 months are associated with adverse birth outcomes in subsequent births, including low birth weight, preterm birth, and small size for gestational age. However, a recent editorial in Obstetrics & Gynecology asserted that these studies are often cross-sectional analyses and do not account for other risk factors present, as would be evident in the birth outcomes of previous pregnancies (Klebanoff 2017). More longitudinal studies are needed to isolate the impact of IPI, independent of other risk factors. Short birth spacing has been identified as a public health priority in New York State (NYS) Department of Health initiatives, including NYS's Prevention Agenda, the Maternal and Child Health Services Block Grant, and the National Infant Mortality Collaborative Improvement & Innovation Network. Objective: Identify if and to what extent previous adverse birth outcomes (preterm birth and low birth weight) moderate the impact of interpregnancy interval length on those same adverse birth outcomes in the subsequent birth. Methods: NYS Vital Statistics birth certificate data for subsequent live births from 2010-2014 were analyzed. Absent a live birth data file matched across birth cohorts, previous preterm birth and previous low birth weight responses recorded in the birth certificate were used to identify birth outcomes for the birth preceding the birth of analysis. The analysis included singleton birth records with a complete date for the previous live birth, and a response to previous preterm birth or previous low birth weight. The interpregnancy interval was calculated as the time between the previous live birth and the conception date of the subsequent birth, calculated using the obstetrical estimate for gestational age and infant date of birth. Small for gestational age was defined for singletons as birthweight < 10th percentile based on gestational age and sex. Preterm birth was defined as delivery before 37 completed weeks of gestation. Low birth weight was defined as birthweight < 2,500 g in pregnancies with ≥ 37 complete weeks gestation. Sensitivity analysis and log-binomial regression analysis were utilized to determine the association between adverse pregnancy outcomes and interpregnancy interval, adjusted for previous adverse outcomes and maternal characteristics including maternal age, race/ethnicity, Medicaid status, and pregnancy intention. Results: There were 476,527 birth records with complete data for a previous live birth during the study period. The proportions of low birth weight, preterm birth, and small for gestational age were 1.8%, 6.46%, and 7.74% in the study population respectively. A sensitivity analysis showed that risk remained elevated for all three outcomes when considering a previous poor outcome of low birth weight or preterm birth for short interpregnancy intervals. Regression analysis adjusting for maternal characteristics and previous poor outcomes diminished the elevated risk associated with short interpregnancy intervals, but some effect of IPI on subsequent preterm birth is preserved. Discussion: In this first attempt to respond to Klebanoff's critique of existing IPI research, IPI does not have a significant impact on subsequent small for gestational age or subsequent low birth

weight when considered with maternal characteristics and occurrence of previous low birth weight. IPI does impact subsequent preterm birth after maternal characteristics and previous preterm birth are controlled. This conclusion is limited by incompleteness and limited validity of some data elements used (e.g., missing previous date of birth or underreported previous preterm birth or low birth weight). This analysis is also limited by only considering outcomes for the newborn, not maternal mortality/ morbidity or birth complications, and does not account for other poor outcomes associated with short IPI (e.g., child maltreatment, child development). More research is needed to identify the true impact of short IPI. A next step will be to create a matched birth file to conduct a more complete analysis.

Rockwell C Environmental Health	10:30	**Assessment of and Response to Perfluorooctanoic Acid in Drinking Water, Bennington, Vermont** - Lori Cragin, Director, Division of Environmental Health; State Epidemiologist for Environmental Health, Vermont Department of Health Co-Researchers: Lauren Prinzing, Brianna Moore, David Grass, Sarah Vose, Jenna Voigt, Harry Chen Description of Vermont's efforts to assess how people in the Bennington community were exposed to PFOA; to ensure no additional actions were needed to prevent continued exposure; and to inform the public of their PFOA blood concentrations and how those concentrations compared to background levels in the U.S. population.

	10:40	**Developing an Indicator of Cyanobacteria Bloom Prevalence for Lake Champlain** - Lauren Prinzing, Epidemiologist, Vermont Department of Health Co-Researchers: David Grass, Jared Ulmer, Bridget O'Brien, Sarah Vose, Angela Shambaugh, Lori Fisher
		Discussion of Vermont's efforts to develop an indicator of cyanobacteria bloom prevalence on Lake Champlain. Challenges were encountered because the number of reports and number of monitoring sites have changed over time. Existing data products do not adequately answer two questions: How bad are conditions right now (compared to this time in prior years? And, is it getting worse?
	11:00	**Increasing Public Health Awareness Through Tracking** - Christine Hahn, Epidemiologist, Connecticut Department of Public Health
		Discussion of Connecticut's efforts to increase awareness and use of their Environmental Public Health Tracking data explorer. Specifically to increase public awareness of the full array of available data and increase use of the state data explorer.
Manchester Infectious Disease Epidemiology - Vaccine Preventable Diseases	10:30	**Hepatitis A Outbreak Among Persons Experiencing Homelessness and Using Drugs in Massachusetts** - Lindsay Bouton, Epidemiologist, Massachusetts Department of Public Health Co-Researcher: Daniel Church
		Background: Starting in April 2018, there has been an increase in reported cases of hepatitis A virus (HAV) infection in individuals experiencing homelessness and using drugs in Massachusetts. Similar outbreaks have been reported in other states, with case counts in the hundreds and high hospitalization and mortality rates. Our objective was to characterize reported cases to target prevention efforts and prevent additional cases. Methods: Laboratory results indicating acute infection with HAV are reportable to the Massachusetts Department of Public Health (MDPH) and routinely investigated by local health departments using the Massachusetts Virtual Epidemiologic Network (MAVEN), a surveillance and case management system. MAVEN was queried for confirmed HAV cases reported from January 1, 2013 – September 12, 2018. We selected cases reported from January 1, 2018 – September 12, 2018 and defined an outbreak case as any case with reported homelessness or unstable housing, history of illicit drug use, or coinfection with hepatitis C virus (HCV). Coinfection with HCV was included as a proxy for illicit drug use. Results: Between 2013 and 2017, the average annual number of confirmed HAV cases reported was 48, with 26% of cases reporting international travel. The hospitalization rate in 2013-2017 was 54%. One percent of cases were experiencing homelessness and 5% reported illicit drug use. Between January 1, 2018 and September 12, 2018, 72 confirmed HAV cases were reported, with 7% of cases reporting international travel. The hospitalization rate in 2018 was 79%. Thirty-six percent of cases were experiencing homelessness and 56% reported illicit drug use. Forty-one (57%) of the 72 cases were linked epidemiologically to the outbreak. There were 29 males (71%) and 12 females (29%), with a median age of 32 (range 21-53). (The non-outbreak cases from 2018 were 19 males (61%) and 12 females (39%), with a median age of 58 (range 23-90).) Twenty-one of the outbreak cases (51%) were residents of Suffolk County. Twenty-seven cases (66%) were experiencing

homelessness or unstable housing. Drug use was reported for 38 cases (93%), and injection drug use specifically for 31 cases (76%). Five cases (12%) had been recently incarcerated. The rate of coinfection with HCV was 66% with confirmed HCV and 12% with probable HCV and the rate of HIV co-infection was 10%. Thirty-eight cases (93%) were hospitalized and there was one reported death. Conclusion: MDPH identified an outbreak of HAV infection among individuals experiencing homelessness and using drugs in the context of similar outbreaks occurring across the country. The Massachusetts outbreak is notable for its high hospitalization rate, likely due both to under-identification of less severe cases and to the high prevalence of underlying liver damage in this particularly vulnerable population. The HIV coinfection rate is also notable given Massachusetts' HIV/AIDS prevalence rate of 317.6 per 100,000 population. MDPH has released two clinical advisories recommending vaccination of high-risk individuals and is working with local boards of health, homeless shelters, jails, community health centers, and other organizations serving at-risk individuals to increase vaccination rates.

10:45	**Implementing Third Dose MMR Vaccine Recommendations During a College Mumps Outbreak** - Laura Ann Nicolai, Deputy State Epidemiologist, Vermont Department of Health
11:00	**An Outbreak of Serogroup B Invasive Meningococcal Disease at the Five College Consortium in Massachusetts, 2017-2018** - Marija Popstenfanija, Epidemiologist, Massachusetts Department of Public Health

11:15

Factors Associated with HPV Vaccination Status Among Vaccine-Eligible Women with High Grade Cervical Lesions: New Haven County, CT 2008-2015 - Savanah Russ, Student Research Assistant, Connecticut Emerging Infections Program

Background: Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States, with an estimated 79 million persons currently infected. In March 2007, the Advisory Committee on Immunization Practices (ACIP) recommended a quadrivalent vaccine that protects against high risk HPV types (16/18) responsible for causing 70% of cervical cancers. While the introduction of the vaccine has resulted in the decline of high-grade cervical lesion (HGCL) incidence, sub-optimal vaccine coverage has allowed for the persistence of HGCL in women who were of the FDA recommended age to receive the vaccine (vaccine-eligible).   Objective: To determine the prevalence of patient-reported and sociodemographic barriers to HPV vaccination in vaccine-eligible women diagnosed with high-grade cervical intraepithelial neoplasia grades 2, 2/3, 3 and adenocarcinoma in situ (CIN2+).   Methods: Since 2008, high-grade cervical intraepithelial neoplasia has been a reportable condition in the state of Connecticut. Enhanced surveillance data were collected on women with CIN2+ residing in New Haven County, Connecticut, including HPV vaccine history and demographics. We identified women diagnosed with CIN2+ between 2008-2015 who were unvaccinated and vaccine-eligible. We evaluated trends in patient-reported reasons for not receiving the vaccine from 2008-2015 using a two-sided Cochran Armitage trend test. A logistic regression analysis was used to assess associations between sociodemographic characteristics and vaccination status among vaccine-eligible women.   Results: Between 2008-2015, 882 (54.3%) vaccine-eligible women diagnosed with CIN2+ reported never receiving the HPV vaccine. The prevalence of these women did not significantly change across the study time period (p≥0.05). The most commonly patient-reported barrier to vaccination was age/too old, followed by previous HPV diagnosis and no provider recommendation to receive the vaccine. The number of women reporting age/too old significantly increased from 2008-2015 (p=0.027, 23%-38%). The adjusted logistic regression determined women who were publicly insured or uninsured were significantly more likely than those privately insured to report no history of vaccination (p<0.5). Discussion: Sub-optimal HPV vaccination rates and continual diagnoses of CIN2+ in vaccine-eligible women reflect the persistence of these barriers to vaccination in vaccine-eligible women. Efforts to improve HPV vaccination rates should focus on correcting misperceptions of vaccine ineligibility due to age, and emphasize the importance of strong and consistent provider recommendations for HPV vaccination.

		11:30	**Impact of 13-Valent Pneumococcal Conjugate Vaccine (PCV13) on Invasive Pneumococcal Disease in Connecticut** - Summer Shore, Epidemiologist, Connecticut Department of Public Health Co-Researchers: S. Petit, C. Marquez, D. Santoro, M. Cartter Background: Invasive pneumococcal disease (IPD) is a leading cause of pneumonia, sepsis, and meningitis. Incidence of IPD has dramatically decreased since the introduction of the 7-valent pneumococcal conjugate vaccine (PCV7) in 2000. Routine immunization with PCV13 was recommended for children <5 years of age in 2010 and for adults aged ≥65 years in late 2014, in series with the 23-valent polysaccharide vaccine (PPSV23). We evaluated PCV13 impact on IPD in Connecticut. Methods: IPD cases (sterile site isolates) were identified through Active Bacterial Core Surveillance (ABCs). Isolates were serotyped and classified as PCV13 (including type 6C due to cross-reactivity), PPSV11 (serotypes unique to PPSV23), or non-vaccine types (non-PCV13 or NVT (<5 and ≥65 years of age, respectively)). To assess effects attributable to vaccination we examined trends from 2008 to 2017 overall and for high risk age groups (<5 and ≥65 years of age). Results: From 2008 through 2017, 3,268 cases of IPD were identified of which 2,976 (91%) had an isolate available for serotyping. Incidence (cases per 100,000) decreased by 44% overall (13.3 in 2008 to 7.4 in 2017), by 60% in cases <5 years of age (17.6 to 7.1), and by 46% in cases ≥65 years of age (38.8 to 21.1) (p<0.01 for each trend). Incidence of PCV13-type disease decreased by 70% overall (7.2 in 2008 to 2.17 in 2017), by 86% in cases <5 years of age (11.1 to 1.6), and by 70% in cases ≥65 years of age (20.9 to 6.3) (p<0.01 for each trend). From 2008 to 2017, incidence of non-PCV13-type and NVT IPD remained stable overall and in cases <5 and ≥65 years of age. Incidence of type 35B IPD increased by 94% (0.17 in 2008 to 0.33 in 2017; p<0.01), with most of the increase in cases ≥65 years of age. Increases in other individual serotypes were not significant. Conclusions: In Connecticut, routine pediatric immunization with PCV13 has significantly reduced rates of IPD in children and unvaccinated adults, indicating rapid direct and indirect vaccine effects. Continued routine administration of PCV13 to adults ≥65 years of age has the potential to directly decrease IPD even further. Continued observation of IPD is needed to monitor potential changes in disease burden that may emerge in PCV13 and non-PCV13 serotypes.
Bennington BRFSS & YRBS		10:30	**Innovative Survey Methodologies in 2017 Connecticut Risk Behaviors Factor Surveillance (CT BRFSS)** - Xi Zheng, Epidemiologist, Connecticut Department of Public Health Discussion of results and effectiveness of two innovative survey methodologies with the CT BRFSS.
		10:48	**Something Old, Something New: Shifting How We Use Routine BRFSS Analyses to Promote Health Equity in Maine** - Caitlin Pizzonia, Research Associate and Epidemiologist, University of Southern Maine Co-Researchers: Nancy Birkhimer, and Erika Lichter Discussion of how Maine currently uses BRFSS analyses alongside other public health surveillance data in new products that encourage statewide conversations about social determinants of health and promoting health equity in populations of need

		11:06	**The Relationship Between the Risk and Protective Factors Associated with Bullying among Vermont High School Students** - Jillian Leikauskas, Public Health Specialist, Vermont Department of Health

Discussion of results from the YRBS to examine how risk behaviors and protective factors differ among Vermont high school students who are bullied electronically or in-person.

11:24 **Using Text Messaging to Follow up with BRFSS Respondents: a Discussion of Methodology and Results** - Samantha Vincent, Senior Associate, ICF

The Vermont BRFSS utilized text messaging to follow-up with respondents to the 2018 BRFSS about marijuana use and perceptions around its use. The presentation will include a discussion for the methodology used, as well as initial results from the project.

11:42 **Gender Expression and Health among Rhode Island High School Students: Data from the 2017 YRBS** - Tracey Jackson, Senior Public Health Epidemiologist, Rhode Island Department of Health

Discussion of results from the YRBS looking at gender expression and its relationship to health among Rhode Island high school students.

12:00 - 1:00pm	**Lunch is served in the Colonnade (First Floor)** **State Epidemiologists Lunch Meeting in Battenkill Room**

1:00 - 2:30p	**Rockwell A/B** Neonatal Abstinence Syndrome / Opioids	1:00	**Homelessness and its Association with Injection Drug Use and HIV in Massachusetts Emergency Departments** - Stefanie Albert, Senior Research Analyst, Massachusetts Department of Health Co-Researchers: R Ergas, S Smith, G Haney, M Klevens
		1:13	**Can Syndromic Surveillance Contribute to Fatal Overdose Prevention Efforts in Massachusetts** - Stefanie Albert, Senior Research Analyst, Massachusetts Department of Health Co-Researchers: Anna Agan, Rosa Ergas, Lauren Larochelle, Jeffrey Yu

1:26

Underutilization of Medication for Addiction Treatment among Admissions to State-licensed Drug Treatment Facilities in Northeast States - Cody Colon-Berezin, Research and Surveillance Coordinator, New York City Department of Health and Mental Hygiene, Bureau of Alcohol and Drug Use Prevention, Care, and Treatment
Co-Researchers: Michelle Nolan, Denise Paone

Background: The United States is in the midst of an opioid overdose epidemic. On average, 115 Americans die every day from an opioid overdose, and more than 630,000 people have died from a drug overdose from 1999 to 2016. In 2016, the number of overdose deaths involving opioids (including prescription opioids, heroin, and illicitly manufactured fentanyl) was five times higher than in 1999. Medication for addiction treatment (MAT) is the most effective treatment for opioid use disorder (OUD). Treatment with opioid agonist medications methadone or buprenorphine is proven to reduce the risk of overdose death and improve social functioning and retention in care. Despite being recognized as the first-line treatment for OUD, MAT remains underutilized for treating OUD in many jurisdictions, with access varying considerably by state. Given recent increases in rates of overdose deaths among Northeast states, particularly those involving fentanyl, it is important to take a closer look at utilization of MAT at the state level. Research Question: What is the prevalence of MAT use among admissions to state-licensed, specialty drug treatment facilities in the Northeast where opioids were listed as the primary substance? Methods: Using 2015 data from Treatment Episode Data Set-Admissions (TEDS-A) – a national data system of annual admissions to substance abuse treatment facilities – we identified admissions to state-licensed, specialty drug treatment facilities for which opioids were cited as the primary substance. We restricted our analysis to eight Northeast states (Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York and New Jersey). To assess utilization of MAT, we calculated the percent of admissions treated with an opioid agonist medication (either methadone or buprenorphine). The analysis was repeated, excluding treatment admissions where benzodiazepines or alcohol were listed as either a secondary or tertiary substance, as these represent admissions where treatment with methadone or buprenorphine may be contraindicated. We present findings disaggregated by state.
 Results: During 2015, there were 545,929 admissions to drug treatment in 8 Northeast states. Of these admissions, 234,870 (43%) had opioids as the primary substance involved. Among admissions with opioids as the primary substance, 67,112 (28.6%) received treatment with methadone or buprenorphine. There was considerable variation in the utilization of MAT for primary opioid admissions between states: 68.4% of admissions in Maine received MAT, followed by Rhode Island (44.3%), Vermont (42.5%), New Jersey (37%), New York (30.3%), Connecticut (29.7%), Massachusetts (12.8%) and New Hampshire (11.4%). After
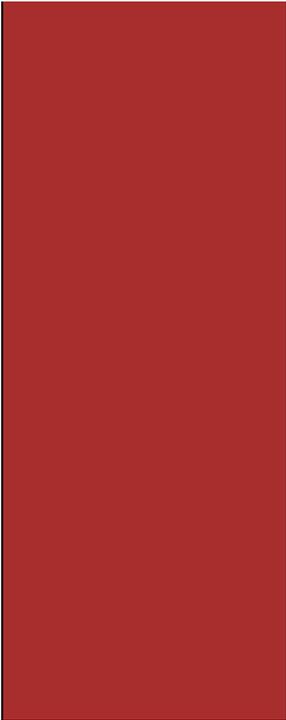
excluding admissions where treatment with buprenorphine or methadone may be contraindicated (n = 68,409), variation in MAT utilization persisted across states: 70.5% of admission in Maine received MAT, followed by Rhode Island (45.7%), Vermont (43.0%), New Jersey (39.0%), New York (33.8%), Connecticut (29.2%), Massachusetts (12.5%) and New Hampshire (10.8%). Conclusion: In 2015, less than one third of eligible patients admitted to state licensed facilities in Northeast states received treatment with methadone or buprenorphine. A similar level of MAT utilization for treatment of primary opioid admissions was observed after excluding admissions where MAT may be contraindicated. States should consider using their authority to promote the utilization of MAT through various strategies within their respective regulatory structures. This analysis is limited by the absence of information on the proportion of patients offered MAT, or patients who were offered but declined to receive MAT. In addition, some admissions to state-licensed treatment programs may receive MAT from an outside provider. As a result, these data may underestimate the true prevalence of MAT utilization among the states included.

1:39

Estimating Exposure to Fentanyl and Adoption of Harm Reduction Techniques in New York City Syringe Exchange Participants - Jonathan McAteer, Evaluation Associate, New York City Department of Health and Mental Hygiene, Bureau of Alcohol and Drug Use Prevention, Care, and Treatment
Co-Researchers: Michelle Nolan, Jaclyn Blachman-Forshay, Denise Paone

Background: Since 2010, rates of unintentional drug poisoning (overdose) deaths have increased annually in New York City (NYC). In 2016, there were 1,425 overdose deaths compared to 942 in 2015. Prior to 2015, fewer than 4% of overdose deaths each year involved fentanyl. In 2016, fentanyl was present in nearly half of all overdose deaths. Although the presence of fentanyl is driving the increase in overdose death, the extent of exposure to fentanyl among people who inject drugs in NYC is unknown. These deaths may be preventable through use of harm reduction techniques. To estimate exposure to fentanyl as well as use of harm reduction practices among syringe exchange program (SEP) participants in NYC, we tested drug residue in used syringes used and administered a brief survey. Methods: A convenience sample was recruited from 11 SEPs in NYC between March and June 2017. Consenting participants (n=434) received a labeled syringe to use. Participants returned the labeled syringe and completed a 20 question survey with five items assessing harm reduction practices and past overdoses. Collected syringes were tested using gas chromatography mass spectrometry (GC-MS) and liquid chromatography quadrupole time of flight mass spectrometry (LC-QTOF). Fentanyl and other substances that were detected in quantities greater than 10% of the residue mass were reported as positive. The NYC Department of Health and Mental Hygiene IRB approved the study. Results: A total of 271 participants returned a syringe and completed a survey. A majority of participants were male (76%), Latino/a/x (61%), and between 35 and 54 years old (64%). Forty-six syringes (17%) contained fentanyl or a fentanyl analogue. Fentanyl was the most frequently identified fentanyl analogue, identified in 36 (13%) syringes. Furanyl-fentanyl was detected in 10 (3.7%) syringes and 4-Fluoroisobutyryl fentanyl was detected in 5 (1.8%) syringes. No other fentanyl analogues were detected. Heroin and cocaine were the most common substances identified, found in 184 (68%) and 95 (35%) syringes, respectively. For the most recent injection 238 (89%) reported use in a place where they would be found if they overdosed and 133 (50%) had a naloxone kit in plain view. A majority of participants (67%) reported that someone they live with knows about their drug use. No participants reported having an overdose between the receipt of the syringe and returning the syringe. Conclusions: Residue testing of syringes is a mechanism to estimate the prevalence of exposure to fentanyl in a population of people who inject drugs. Participants in syringe exchange programs use a number of harm reduction strategies which may help reduce their

risk of fatal overdose death.

1:52

Prescriber Notification of Patients' Drug Overdose Deaths in New York City (NYC): A Pilot Study - Kendall LaSane, Overdose Mortality Epidemiologist, New York City Department of Health and Mental Hygiene, Bureau of Alcohol, Drug Use Prevention, Care and Treatment
Co-Researchers: Jaclyn Blachman-Forshay, Alice Welch, Denise Paone

Introduction: The opioid overdose epidemic has led to the development of novel strategies promoting more judicious prescribing. One such strategy is to notify medical providers when a patient to whom they have prescribed an opioid analgesic and/or benzodiazepine died of an accidental drug poisoning (overdose). To date, no published data exist about provider response to such feedback. To test feasibility and provider reception, the NYC New York City Department of Health and Mental Hygiene (NYC DOHMH) piloted the Provider Notification Project (PNP) study to inform prescribers by letter that their patient had a fatal overdose involving an opioid analgesic or benzodiazepine they prescribed. This presentation describes feasibility and early provider responses. Methods: Using linked data from the NYC Office of the Chief Medical Examiner (OCME) and the NYC Office of Vital Statistics, DOHMH identified deaths eligible for the PNP. Eligible deaths met the following inclusion criteria: 1) the OCME ruled the death an unintentional drug overdose, defined as deaths assigned an ICD-10 code of X40-X44; 2) post-mortem toxicology testing detected the presence of opioid analgesics and/or benzodiazepines; 3) the OCME file indicated opioid analgesics and/or benzodiazepine pill bottles in the decedent's name were found at the scene; and 4) the OCME file included photos of the aforementioned pill bottles to identify the prescriber. After verifying prescriber information with the pharmacy named on the pill bottles, DOHMH staff sent an informational packet to the prescriber to notify them about the patient's death. Contents included a letter from the NYC Commissioner of Health and educational materials about judicious prescribing, substance use disorder screening, and strategies to integrate harm reduction practices (tapering medication and prescribing naloxone and buprenorphine) into clinical settings. A follow-up survey was either electronically sent or mailed to the prescriber six weeks later. The survey included questions about specialty type, awareness of the death of their patient, as well as an open-ended question which was coded into themes. This study was approved by the DOHMH Institutional Review Board. Results: To date, 317 deaths met inclusion criteria 1 and 2. A total of 45 deaths had sufficient data to identify the prescriber(s) (criteria 3 and 4; 14.5%). Notification letters were sent to 46 prescribers. One decedent received two distinct opioid analgesic medications that contributed to their death from two prescribers. Eighteen prescribers have completed the survey (response rate: 39%). The majority of respondents were physicians (n=16, 89%) with two responses from physician assistants (n=2, 11%). A majority of prescribers were pain management or
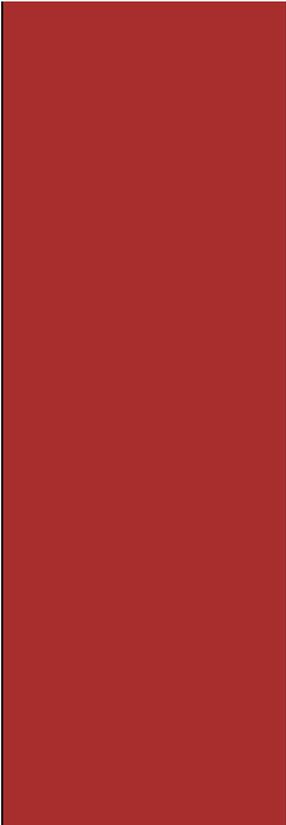
physical medicine and rehabilitation specialists (n=10, 56%) and worked in either private practice or outpatient settings (n=17, 94%). Most prescribers were aware prior to receiving our letter that their patient died (n=11, 65%). Three themes emerged from the open ended responses: prescribers found the correspondence helpful, prescribers described current risk reductive efforts to prevent overdose (urine drug testing, referrals for treatment, prescribing buprenorphine), and prescribers wanted to avoid culpability. Discussion: PNP is ongoing, but early results show that providers are receptive to feedback and interested in materials sent. More data are needed to determine how notifying prescribers about their patients' death might change prescribing practices and/or promotion of harm reduction messages. Linking Prescription Drug Monitoring Program (PDMP) and mortality data would have permitted review of prescription records for all 317 overdose deaths involving an opioid analgesic and/or benzodiazepine, rather than limiting us to the 45 deaths for which prescription bottles were found on the scene. We, like many local health departments did not have access to these data. Jurisdictions considering a similar project should consider utilizing PDMP data to identify prescribers when possible, rather than death scene investigations.

2:05

Opioid Use Disorder in Pregnancy and Perinatal Substance Use in New York State Birthing Hospitals - Kristen Lawless, Program Director, New York State Perinatal Quality Collaborative, New York Department of Health, Division of Family Health
Co-Researchers: Amanda Roy, Michael Horgan, Eileen Shields, Anne Marie Reynolds, Marilyn Kacica

Background: The prevalence of pregnant women with substance use disorder (SUD) has increased dramatically over the past decade. Delivery and birth hospitalizations present an opportunity to identify and treat pregnant women with SUD and neonates at risk for neonatal abstinence syndrome. Toxicology screening is an important tool in this process, however policies/practices vary across birthing hospitals. The purpose of this study was to assess the variation in toxicology screening policies/practices in New York State (NYS) birthing hospitals. Methods: The NYS Department of Health, NYS Perinatal Quality Collaborative administered a survey to all NYS birthing hospitals on policies/practices for toxicology screening of pregnant women and neonates during the delivery/birth hospitalizations. One survey per birthing hospital was completed by an obstetrical/neonatal team using Survey Monkey. Results were analyzed using SAS 9.4. Results: Surveys were completed by all NYS birthing hospitals (n=124), yielding a 100% response rate. Written policies on toxicology screening for both pregnant women and neonates were found in 49% of birthing hospitals. Universal toxicology screening of pregnant women was practiced in 15% of birthing hospitals, primarily in Western NYS (54%) and (31%) Long Island. The majority (85%) of birthing hospitals reported screening some pregnant women based on risk criteria, which included: history of substance use (SU) (73%); observed signs/symptoms of SU during the delivery hospitalization (61%); late/no prenatal care (55%); placental abruption (42%); and self-report of current SU (37%). For confirmed positive maternal toxicology screening results, most birthing hospitals referred for social work consultation (94%) and/or Child Protective Services (83%). Birthing hospitals with higher perinatal designation levels referred to more types of services than lower level birthing hospitals, including treatment programs and outside counseling. Top criteria for initiating neonatal toxicology screening included: maternal positive toxicology screening results (96%); maternal self-report of current SU (96%); neonatal signs of withdrawal (92%); maternal signs/symptoms of SU (90%) and maternal history of SU (89%). Neonatal toxicology screening was performed most commonly on urine samples (95%) followed by meconium (48%); many birthing hospitals sent more than one sample type for testing. Approximately 4% of birthing hospitals sent the umbilical cord for toxicology screening. Conclusion: Variation in policies/practices for toxicology screening was observed in NYS birthing hospitals. Fewer than half of birthing hospitals had written toxicology screening policies for both pregnant women and neonates. Western NYS and Long Island had the most birthing hospitals

		practicing universal maternal toxicology screening. These study findings present an opportunity for a statewide initiative to address variation in toxicology screening and referral policies/practices during delivery/birth hospitalizations in NYS.
	2:18	**Outcomes of Children Born to Mothers in Treatment for Opioid Dependence: The Vermont Experience** - Abby Crocker, Research Assistant Professor, The University of Vermont, Department of Mathematics & Statistics Co-Researcher: Nic Peterson
Rockwell C Environmental Health	1:00	**Naturally Occurring Radionuclides in Vermont Air and Drinking Water: If You Have One, Do You Also Have the Others?** - Sille Larsen, Senior Drinking Water Engineer, Vermont Department of Health The presence of radionuclides in air and water in Vermont was investigated and related to geology to understand and identify geographical areas of concern. Overlay analysis and statistical methods were used to evaluate the concurrence of multiple nuclides, to better understand human exposure.
	1:20	**Estimating the Health Benefits of Climate Mitigation Actions** - Jared Ulmer, Climate and Health Program Coordinator, Vermont Department of Health Co-Researchers: Abby Gates, Lauren Prinzing, David Grass We don't have to wait decades to reap the benefits of climate change mitigation actions. Changing transportation behaviors, making homes more energy efficient, and planting trees all help to address more local and immediate health challenges, while also helping reduce long-term health impacts related to climate change. Come learn more about how the Vermont Department of Health combines epidemiologic research and local data to forecast the health benefits of climate change mitigation actions and works with partners to help achieve complementary objectives.
	1:40	**Cold Weather-Related Illness Detected by Syndromic Surveillance, Boston, December 2017-January 2018** - Erin Polich, Epidemiologist, Boston Public Health Commission Co-Researchers: Charles Alpren, Julia Gunn, Michael Donovan, Dan Dooley, Jenifer Jaeger Analysis of trends in hypothermia and frostbite in Boston, specifically among the homeless population, in order to compare ED utilization during the cold weather in early 2018 to previous utilization.

| | | 2:00 | **Too Hot in Vermont: Impacts of the 2018 Heat Wave** - Lauren Prinzing, Epidemiologist, Vermont Department of Health
Co-Researchers: Jared Ulmer, Veronica Fialkowski, David Grass, Chelsea Dubie

Syndromic surveillance, Emergency Medical Services run reports, and vital records data were used to assess morbidity and mortality associated with the heatwave Vermonters experienced in July 2018. Key findings and implications for future preventive efforts will be discussed. |
| **Manchester**

Infectious Disease Epidemiology - Potpourri | | 1:00 | **A Novel Approach for Generating Interactive Maps of Communicable Disease Reports** - Robert Arciuolo, City Research Scientist, NYC DOHMH
Co-Researchers: Eric Peterson, Jennifer Rossen

BACKGROUND: Geographic information systems (GIS) are valuable tools for public health disease surveillance activities. However, traditional GIS mapping can be resource intensive, inflexible, and web-based applications may breach data privacy requirements. We sought to employ a flexible and secure platform for interactive geographic display of communicable disease data to be utilized in the identification of disease clusters and for outbreak control in New York City. METHODS: Communicable disease surveillance data, including patient address information, were obtained from electronic reports and case investigations. Data were stored in Maven, a disease surveillance database. Addresses were assigned latitude and longitude coordinates in near real-time via integration with a geocoding web service. Case-based geographic and epidemiologic data (e.g., patient demographics, symptom onset, infectious period, and outbreak association) for select communicable diseases were extracted from Maven and transformed using SAS v9.4 to produce a Keyhole Markup Language (KML) file; KML files contain geographic data for display in compatible GIS software. For KML visualization, we used Google Earth Pro, a free downloadable application. KML files were generated prospectively for measles, mumps, and pertussis case reports weekly starting in 2015, and daily for legionella case reports starting October 2017. KML outputs were integrated with cluster detection analyses using the prospective space-time scan statistic in SaTScan starting June 2017. RESULTS: Interactive maps with flexible data layers were generated for measles, mumps, pertussis, and legionella reports at no additional programmatic cost while maintaining patient privacy. These maps were easily accessible to staff and enabled rapid visualization of geographic associations among cases including shifts in the focal point of a pertussis outbreak over time. KML output from SaTScan analyses allowed for visualization of the spatial extent of significant clusters and added salient data layers (e.g., cooling tower locations with inspection data for clusters of legionellosis). As will be demonstrated, a practical feature of Google Earth Pro is the ability to plot cases in both space and time using a moving image that |

displays cases while infectious and/or as diagnosed over time. Users can also access a customizable pop-up window to display key clinical, epidemiologic, or demographic data for individual cases, and can quickly measure distances between cases or points of interest.   CONCLUSION: We describe a novel approach for generating flexible interactive maps to support communicable disease surveillance activities and visualize outbreaks dynamically. Maps are visualized using free software while maintaining patient privacy. This methodology may be useful to other public health jurisdictions.

1:15

Hospital-Onset *Clostridium difficile* Infection and Area-based Poverty in Hospitalized New Haven County, Connecticut residents, 2011-2016 - Kaylen Brzozowski, Research Assistant, Connecticut Emerging Infections Program

Background: Census tract level geocoding is increasingly recognized as a method to evaluate socioeconomic status (SES) and its relationship with diseases. Traditionally, Clostridium difficile infection (CDI) is associated with hospitalization, antimicrobial use, age 65 years and older, female gender, and white race. One recent study suggests that hospital-onset CDI (HO-CDI) occurs more frequently in hospitalized persons of higher income. Objectives: This study aims to describe the relationship between HO-CDI incidence in hospitalized patients and poverty level, as well as to establish the practicality of using geocoded hospitalization denominators when evaluating hospital-onset disease incidence.   Methods: HO-CDI cases were identified from all 2011-2016 geocoded CDI surveillance cases from New Haven County, Connecticut and linked to census tract poverty levels using the 2014 American Community Survey (ACS). Geocoded data for 2014 hospitalized New Haven County residents were linked to the 2014 ACS and multiplied by 6 to estimate the 6-year hospitalization denominator. Crude and age-adjusted HO-CDI incidence rates were calculated and stratified by demographic characteristics. Age-adjusted rates were adjusted to the 2000 Census population distribution of New Haven County.   Results: Overall, age-adjusted HO-CDI incidence tended to decrease from the lowest to the highest poverty level (<5% IR: 75.6 versus ≥20%: 62.9; p-value for trend=0.010). A similar trend was observed among females (p=0.020), Whites (p=0.043), and Hispanics (p<0.001). HO-CDI rates for Blacks were greater than rates for Whites and Hispanics in three out of four poverty groups, most notably in the lowest poverty level (Blacks IR: 118.7 versus Whites: 72.8, Hispanics: 36.2). Males had higher HO-CDI rates than females across all poverty levels.   Conclusion: These results are consistent with the previous finding that CDI incidence increases with increased income, and they add new information that HO-CDI incidence is higher among hospitalized males in all poverty levels, as well as for Blacks in three out of four poverty levels.   Using geocoded hospitalized patient denominators makes it possible to examine

HO-CDI with appropriate denominators and could be done in other jurisdictions where household income data is not collected.

1:30

Temperature and Hydrology Improve the Prediction of West Nile Virus in New York and Connecticut – Alexander (Sasha) Keyel, Research Affiliate, Wadsworth Center/SUNY Albany

West Nile virus (WNV; Flaviviridae: Flavivirus) is a widely distributed arthropod-borne virus that has negatively affected human health and animal populations. Whereas climatic relationships have been observed between WNV and mosquito infection rates and human cases, previous studies have been conducted at a variety of spatial and temporal scales, and the scale-dependence of these relationships has been understudied. Methodologically, the degree to which predictions differ for novel spatial locations compared to novel temporal locations is unclear. We tested the hypotheses that climate variables would be important 1) at all spatial scales, 2) for predicting WNV in a new spatial location (county), and 3) for predicting WNV in a new temporal unit (year). We analyzed WNV infection rate of mosquitoes and number of human cases in New York and Connecticut using a machine learning technique. In the model development, 42 climate-related variables were tested for predictive skills. The variables are based on growing degree days, minimum and maximum temperatures, precipitation amount and intensity, and seasonal anomalies for each of these variables. In addition, we examined anomalies in soil hydrology. We also included 19 non-climatic variables to account for known effects (e.g., land cover and human population), surveillance related information (e.g., relative mosquito abundance), and to assess the potential explanatory power of other relevant factors (e.g., presence of sewage treatment plants). Random forest models were used to identify the most important climate variables for explaining spatial-temporal variation in mosquito infection rates (MIR). The results of the cross-validation support our working hypothesis that climate variables together with non-climatic environmental covariates provide significant predictive skill for MIR and human cases at county-level and point scales. Models demonstrated predictive skill, but still over- and under-estimated WNV MIR and numbers of human cases. Prediction of a new spatial location was generally more accurate than predictions for a new year. Models at fine spatial scales had lower absolute errors but had greater errors relative to the mean infection rates.

1:45

Outbreak of *Burkholderia cepacia* Complex Linked to a Contaminated Cosmetic Product –Pennsylvania, 2018 - Julie Paoline, Regional HAIP/AS Specialist, Pennsylvania Department of Health

Disclosure: The submitter has no conflicts of interest to report. Background: Health care facilities routinely provide patients with

cosmetic products, such as skin and wound care products, to support personal hygiene and wound healing. In January 2018, the Pennsylvania Department of Health was notified of a cluster of Burkholderia cepacia complex (Bcc) isolates in a heterogeneous group of patients at a Pennsylvania acute care facility. Bcc are resilient, adaptable and can survive in a variety of environments, as they can exhibit resistance to preservatives and can cause contamination of liquid medications or products. Methods: We reviewed medical records for reported cases and compared epidemiological data. Also, infection control observations and interviews with infection control and environmental services staff were conducted. We provided preliminary recommendations for infection control improvements and water quality management, with the suspicion that local water contamination may be a factor. Bacterial culture of personal care and medical products was conducted by the facility laboratory, state public health laboratory, and the Centers for Disease Control and Prevention (CDC). Results: During November 2017 through March 2018, ten patients were identified with Bcc infections from various sites including urine (5), wounds (2), peritoneal fluid (2), and sputum (1) at a single Pennsylvania acute care facility. The facility laboratory tests identified Bcc in a no-rinse foam cleansing product. The product was also tested by state and federal public health laboratories. A CDC Call for Cases was issued which led to the identification of a multi-state outbreak. A final analysis of specimens from multiple states indicated 15 patient isolates from 3 states and numerous product isolates were matched by Pulsed Field Gel Electrophoresis (PFGE), confirming the cosmetic product as the outbreak source. Notifications of the findings and product recall instructions were disseminated to instruct healthcare facilities to discontinue use of the recalled product to prevent additional cases. Further investigation at product manufacturing sites was conducted by the Food and Drug Administration (FDA) and the recall was expanded to include additional over-the-counter products within expiry due to possible contamination. Conclusions: Rapid notification to public health officials of an unusual cluster of Bcc in an acute care facility led to a nationwide product recall. Strategies to prevent and control a disease event of this scope include enhanced surveillance for healthcare-associated infections, coordination of multi-agency responses, and building relationships between health care facilities, clinical laboratories and government agencies aimed at protecting the public's health, including state and local health departments.

| 2:00 | **Symptomatic *Entamoeba dispar* Infections Among Men Who Have Sex with Men, New York City, 2018** - Corinne Thompson, Waterborne Disease Epidemiologist, New York City Department of Health and Mental Hygiene |

BACKGROUND: Amebiasis is a parasitic diarrheal infection transmitted through ingestion of contaminated food or water or through oral-anal sexual contact. Entamoeba histolytica is

considered to be the pathogenic species causing amebiasis, while the morphologically indistinguishable species E. dispar is historically considered non-pathogenic. The New York City (NYC) Department of Health and Mental Hygiene (DOHMH) investigated a cluster of gastrointestinal (GI) illness among adult men with stool specimens positive for E. dispar.   METHODS: All laboratory-confirmed amebiasis cases in NYC are reportable to DOHMH, and all reported amebiasis specimens are submitted to the Wadsworth Center Parasitology Laboratory (WCPL) for confirmation. Spatiotemporal clusters of reportable communicable diseases are identified at DOHMH through daily use of the prospective space-time permutation scan statistic (SaTScanTM). For the present GI illness cluster, patients (or their healthcare providers) were interviewed by telephone to obtain clinical and risk behavior information. Specimens were tested by microscopic examination and real-time PCR to distinguish E. histolytica from E. dispar.   RESULTS: A cluster of eight GI illness cases with stool positive for E. dispar diagnosed over 11 days and living within ~3-kilometer radius in Manhattan was identified in February 2018. Symptom onset dates ranged from June 2017–February 2018. The median age was 41 years (range: 25–50 years), and all identified as men who have sex with men (MSM). Of seven patients with known risk behavior, three (43%) reported oral-anal sexual contact and five (71%) reported inserting either his penis or finger into his partner's anus in the two weeks prior to symptom onset. Whether any of the eight patients had contact with each other was not ascertained. Two patients also had giardiasis within 30 days of E. dispar diagnosis. All eight patients were symptomatic, with diarrhea (88%), abdominal pain (75%), and fatigue (71%) most frequently reported. Five (63%) were treated with an antimicrobial or antiparasitic agent.   Specimens from five patients were sent to WCPL. All were positive by microscopy for E. histolytica/E. dispar and positive for E. dispar by real-time PCR. One specimen was also positive for Giardia, and another was positive for Endolimax nana, both by microscopy. CONCLUSIONS: E. dispar likely caused this GI illness cluster among MSM in NYC. Additional efforts to understand the possible pathogenicity of E. dispar and its impact among MSM are warranted. Specific outreach to the MSM patient and provider communities, focusing on prevention and control of sexually transmitted parasitic enteric infections, should be pursued.

Bennington BRFSS & YRBS Roundtable	1:00	**BRFSS and YRBS Roundtable: Data Dissemination** Jessie Hammond, Public Health Analyst, Vermont BRFSS Coordinator, Vermont Department of Health Tracey Jackson, Senior Public Health Epidemiologist, Rhode Island Department of Health Kristen Murray, Public Health Analyst, Vermont YRBS Coordinator, Vermont Department of Health Xi Zheng, Epidemiologist, Connecticut Department of Public Health The Youth Risk Behavior Survey (YRBS) was developed to monitor priority health risk behaviors that contribute to the leading causes of death, disease, injury and social problems among youth. The Behavioral Risk Factor Surveillance Survey (BRFSS) tracks health-related risk behaviors among adults. Both the YRBS and BRFSS are part of a larger effort to improve health in our communities. This roundtable offers the opportunity to engage with YRBS and BRFSS state coordinators about effectively disseminating survey data. How is the data shared with key partners? How did the State receive buy-in from partners? How have states used and applied YRBS and BRFSS data to improve adolescent and adult health? In this roundtable discussion, panelists share the challenges and successes they've encountered in their state, with time for discussion and Q&A.	

2:30 - 3:00pm	**Afternoon Break with Refreshments**		

	Rockwell A/B PRAMS	3:00	**PRAMS in the Northeast: Partnerships & Current Directions** - John Davy, Public Health Analyst / PRAMS Coordinator, Vermont Department of Health An overview of PRAMS initiatives in the Northeast, with an emphasis on emerging data topics and effective partnerships
3:00 - 4:30pm	**Rockwell C** HIV & Viral Hepatitis	3:00	**Outbreak of Hepatitis A among Men Who Have Sex with Men — New York City, 2017–2018** - Julia Latash, City Research Scientist, New York City Department of Health and Mental Hygiene Co-Researchers: Julia Latash, Marie Dorsinville, Paula Del Rosso, Mike Antwi, Vasudha Reddy, HaeNa Waechter, Yulin Lin, Guo-Liang Xia, Bruce Gutelius Discussion of oubreak of Hepatitis A among MSM
		3:20	**Outbreak of HIV among People Who Inject Drugs and the Use of Genomic Surveillance- NE Massachusetts 2017-Present**- Charles Alpren, EIS Officer, Boston Public Health Commission

		3:40	**Using Surveillance and Molecular Data to Identify HIV Clusters: The New York State Experience** - Jayleen Gunn, Bureau of HIV/AIDS Epidemiology, New York State Department of Health *Discussion of HIV Outbreak in Upstate New York*
Manchester Infectious Disease Epidemiology - Enteric		3:00	**An Outbreak of Vibrio Illnesses Associated with Two Locations of a Manhattan Restaurant, 2018** - Lan Li, Foodborne Disease Epidemiologist, New York City Department of Health and Mental Hygiene Co-Researchers: HaeNa Waechter, Faina Stavinsky, Vasudha Reddy, Bruce Gutelius Background: Vibrio parahaemolyticus (Vp) is a bacterium that can cause gastrointestinal illness and is naturally-occurring in brackish or salt water. Vp infection is often associated with consumption of raw or undercooked shellfish and outbreaks are commonly reported during summer months. Approximately 20–35 cases of Vp are reported annually to the New York City Department of Health and Mental Hygiene (NYC DOHMH), with the majority of cases reported during the summer. In June 2018, DOHMH identified an outbreak of Vp infections associated with two locations of Restaurant A in Manhattan, NYC. DOHMH epidemiology, environmental, and laboratory staff worked closely together to coordinate the investigation. Methods: Vp infection is reportable in NYC. Upon notification, patients are interviewed and bacterial isolates are sent to a public health laboratory for confirmation and subtyping. Cases are normally reported through hospital laboratories, however they might also be identified when members of the public report foodborne illness events through NYC's non-emergency complaint system, 311. Complainants are interviewed and stool specimens are requested for testing. For this investigation, a confirmed case was defined as a positive stool culture result for Vp in a person who reported consuming raw oysters at Restaurant A. A probable case was defined as either: (1) a positive culture-independent diagnostic test for Vp, or (2) gastrointestinal symptoms compatible with illness caused by Vp, and a history of dining at restaurant A with someone with a confirmed case of vibriosis, in a person who reported raw oyster consumption at Restaurant A. DOHMH performed environmental assessments at Restaurant A and obtained shellfish samples for testing. Isolates were subtyped by whole genome sequencing (WGS). Results: A total of eight cases (three confirmed and five probable) were identified. Of these, four were reported via routine surveillance and four were identified through 311 reporting. All eight patients reported consuming raw oysters at one of the two locations of Restaurant A. Four types of oysters were collected from the restaurant, and all tested positive for Vp. WGS analysis found that the sequences of two available clinical isolates were highly related to each other; however, the sequences of oyster isolates were found to be unrelated to those of the clinical isolates.

Environmental assessments at the establishment did not reveal any critical food safety violations, although a foodhandler was observed soaking an oyster shucking tool in a bucket of water, which may contribute to cross-contamination. Conclusion: The suspected cause of this outbreak of Vp was the consumption of raw oysters at Restaurant A. This investigation highlights the importance of integrating routine follow-up of Vp laboratory reports with responses to complaint data, as these reporting systems offer complementary opportunities for case-finding, and communication among groups responsible for responding to data from each system may enhance timeliness of cluster identification and implementation of public health interventions. Restaurant operators should be educated on proper food handling to minimize cross-contamination and maintenance of proper storage temperature of raw oysters. Consumers should be educated on the risks of consuming raw oysters, especially during summer months.

| 3:20 | **Goat Cuddling and Cryptosporidium: Detecting, Responding, and Preventing Illnesses Associated with Agritourism** - Jonathan Barkley, Public Health Epidemiologist, Rhode Island Department of Health |

In April 2018, the Center for Acute Infectious Disease Epidemiology (CAIDE) at the Rhode Island Department of Health (RIDOH) identified a cryptosporidiosis outbreak associated with baby goat contact at a farm in Middletown, RI. The RI Department of Environmental Management (DEM) was promptly notified and a quarantine order was issued for animals on the farm. In total, 21 laboratory confirmed cases and 34 probable cases were identified as part of the outbreak. A subset of clinical specimens (n=10) was sent to CDC for molecular characterization and the same subtype of C. parvum was identified from all isolates. Cases reported attending "pet and cuddle" events at the farm on weekends between 03/25/18 and 04/08/18, and all reported contact with baby goats. Symptoms began a median of 7 days after visiting the farm (n=53) and lasted for a median of 9.5 days (n=12). The median age of the cases was 29 years, and 64% were female. Approximately 2/3 of cases with available hand hygiene information (n=46) reported not washing their hands in a manner effective against Cryptosporidium (using hand sanitizer only or not washing hands at all). During the initial farm investigation, DEM identified sanitation issues and all animals were tested for Cryptosporidium. Two goats tested positive and were separated from other animals on the farm. A follow-up joint investigation was held with representatives from DEM and RIDOH to ensure risks were sufficiently mitigated and adequate handwashing was in place before the quarantine order was removed. Recognizing that other farms in the state may similarly allow members of the public to interact with animals, an agritourism and risk workshop was organized by DEM in May 2018 and attended by local farmers and partners from RIDOH and USDA.

3:45   **Association of Census Tract Level Poverty with Salmonellosis, FoodNet, 2010-2016** - James Hadler, Consulting Epidemiologist, Emerging Infections Program, Yale School of Public Health
Co-Researchers: Laura Bleiel, Paula Clogher, Kimberly Yousey-Hindes and Sharon Hurd

BACKGROUND: Salmonella is a common foodborne pathogen estimated to cause over one million illnesses and 450 deaths in the U.S. per year. Examination of incidence by area-based socioeconomic status (ABSES) can be used to identify SES groups at higher risk for exposure and for targeted prevention efforts. No U.S.-based national-level analyses using ABSES have been done for salmonellosis. METHODS: Geocoded FoodNet (10 states/sites including New York State and Connecticut, 48 million population) surveillance data for cases of salmonellosis from 2010-2016 were matched to census tracts; census tract poverty status was determined from the 2011-2015 American Community Survey. Cases were categorized based on the percent of the census tract population living below the federal poverty line (0-<5%, 5-<10%, 10-<20%, 20+%). Age-specific and age-adjusted incidence rates for each poverty category were calculated for all Salmonella and each of 10 leading serotypes. The same analyses were also done after excluding cases known/suspected to have acquired Salmonella during international travel. Significance of associations was tested by chi-square for trend. RESULTS: Overall, 52,821 (>96%) cases were geocoded. Higher age-adjusted incidence of salmonellosis was associated with higher census tract poverty level (p<0.001, relative risk highest to lowest poverty group = 1.21). Age-specific results were consistent with the overall results except for adults ages 18-49 years. Children 0-4 years had the strongest association with higher poverty (relative risk highest to lowest poverty group = 1.89). Incidence of each of the 10 leading Salmonella serotypes was associated with higher poverty level (p<0.03) except for Enteritidis. In children 0-4 years, incidence of 9 of the 10 leading serotypes, including Enteritidis, was associated with lower SES (p<0.005). These major findings were not consistent across all FoodNet sites. When analysis was limited to presumed domestically acquired cases, all associations with higher poverty levels strengthened. CONCLUSIONS: Domestically-acquired salmonellosis in the US is associated with increasing census tract poverty level – particularly in children ages 0-4 years and for most leading serotypes except S. Enteritidis, although these major findings are not consistent across all states. The reasons for these associations all-site but inconsistent across sites are currently unknown. While these data form a baseline for setting national goals to reduce disparities at the national level, each state should conduct its own analyses by census tract poverty to determine the

direction and strength of the relationship to salmonellosis. Current salmonellosis prevention efforts should include all SES groups with emphasis on children ages 0-4 years living in higher poverty census tracts.

4:05	**Outbreak of Botulism Associated with Home-Canned Peas — New York City, 2018** - Genevieve Bergeron, EIS Officer, NYC DOHMH (Bureau of Communicable Diseases) Co-Researchers: Julia Latash , Cherry-Ann Dacosta-Carter, Egan Christina, Faina Stavinsky, John Arek Kileci, Allison Winstead, Benyang Zhao, Michael J. Perry, Kevin Chatham-Stephens, Dost Sarpel, Scott Hughes, Maureen A. Conlon, Seth Edmunds, Mirna Mohanraj, Jennifer Rakeman-Cagno, Dominick A. Centurioni, Carolina Lúquez, Amy K. Chiefari, Scott Harper

In June 2018, the New York City Department of Health and Mental Hygiene was notified of three women from the same family who presented to a hospital with acute nausea, dizziness, blurred vision, slurred speech, ptosis, thick-feeling tongue, and shortness of breath. Two patients rapidly developed respiratory failure and were intubated in the emergency department and the third patient was intubated within 12 hours of presentation. Approximately 14 hours before hospital presentation, the patients shared a homemade potato salad that contained commercially produced, frozen peas that had been home-canned when the family's freezer malfunctioned. The combination of cranial nerve palsies and respiratory failure in multiple patients suggested botulism, a paralytic illness caused by botulinum neurotoxin (BoNT) most commonly produced by Clostridium botulinum. Botulism antitoxin was released by CDC and administered to all patients within approximately 12 hours of presentation. All three patients survived but required prolonged intensive care (range 34-54 days) and rehabilitation.   Two patients had serum specimens collected before antitoxin administration and all had stool samples collected after antitoxin administration. Testing performed included mouse bioassay, Matrix-Assisted Laser Desorption/Ionization Time-of-Flight Mass Spectrometry, and polymerase chain reaction. Testing of clinical specimens from all three patients demonstrated the presence of BoNT type A with a silent B gene (BoNT type A(B)). A wash from the empty jar that previously held the suspect peas and food residual from the salad bowl were also positive for BoNT type A(B). Whole genome sequencing analyses demonstrated the isolates were indistinguishable and other environmental samples, including different home-canned vegetables, were negative for BoNT, confirming the peas as the source of the outbreak.   The patient who prepared the home-canned peas reported being a novice home-canner. She used a peach preserves recipe with a boiling water technique, replacing the peaches with frozen vegetables. The patient was unaware that low-acid foods such as vegetables must be preserved in a pressure-canner to eliminate C. botulinum spores (1). After the jars cooled down, the patient

	appropriately checked for jar seal. One of the jars of peas was not sealed, so the patient covered and refrigerated it, and then consumed the peas in the homemade potato salad with her family approximately one or two weeks after canning. The recommendation to refrigerate and consume unsealed can contents within several days is consistent with United States Department of Agriculture (USDA) guidelines only when cans have been adequately processed. In the absence of a pressure-canning step, C. botulinum spores were not eliminated and the closed jar created an anaerobic environment favorable for the spores to germinate and produce BoNT. This outbreak illustrates the importance of educating home-canners on safe home-canning practices to prevent botulism. Consumption of home-canned food, even when using commercial items, can still lead to severe morbidity or mortality if processed incorrectly. Moreover, education should stress not deviating from safe home canning guidelines, especially with low acidity foods, and that canners should discard or adequately re-process foods when processing errors occur.
4:45 - 5:15pm Manchester	**Influenza Coordinators Meeting**
6:00 - 8:00pm **Colonnade**	**Dinner Presentation: Why Men's Health Matters for MCH Outcomes** - Jermane Bond, PhD, Assistant Research Professor of Prevention and Community Health at the Milken Institute School of Public Health at the George Washington University in Washington, DC and Senior Fellow at the National Collaborative for Health Equity in the District of Columbia Recent innovations have emphasized the significant role that men play in contributing to optimal maternal and child health (MCH) outcomes. Partnerships and working groups have previously identified reproductive health and preconception care as an effective intervention point for addressing the health care needs of men and improving their involvement during pregnancy. However, very few studies have included men in investigating family planning programs and pregnancy outcomes. These missed opportunities offer researchers and collaborative groups a great chance to develop evidence-based strategies to improve paternal involvement before, during and between pregnancies, particularly in communities where paternal involvement has traditionally been low and pregnancy outcomes have been poor. Building on the success of the Commission on Paternal Involvement in Pregnancy Outcomes, (a trans-disciplinary working-group of public health professionals convened in 2009 to raise public awareness of expectant fathers in pregnancy) this discussion will assist in continuing the conversation to include men in MCH programs and initiatives.