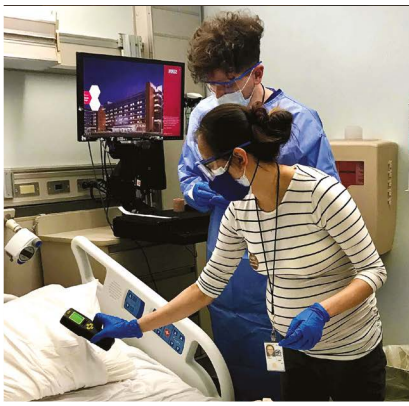
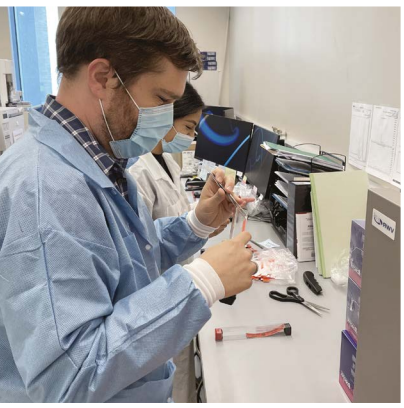
2024 EIS CONFERENCE





Epidemic Intelligence Service (EIS) Conference

April 23-26, 2024 | Atlanta, Georgia

www.cdceisconference.org

CDC
U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

2024 Epidemic Intelligence Service (EIS) Conference

April 23–26, 2024

Agenda-at-a-Glance

TUESDAY

- **WELCOME AND CALL TO ORDER** — 8:30–9:00 am
- **SESSION A:** Stephen B. Thacker Opening Session — 9:00–10:45 am
- **BREAK** — 10:45–11:15 am
- **CONCURRENT SESSION B1:** Climate and Health — 11:15 am–12:40 pm
- **CONCURRENT SESSION B2:** Complex Healthcare-Associated Investigations — 11:15 am–12:40 pm
- **LUNCH** (on your own) — 12:40–1:40 pm
- **SARAH LUNA MEMORIAL TED-STYLE TALK SESSION 1** — 1:40–2:45 pm
- **BREAK** — 2:45–3:15 pm
- **CONCURRENT SESSION C1:** Global Health — 3:15–5:00 pm
- **CONCURRENT SESSION C2:** Environmental Health — 3:15–5:00 pm
- **PREDICTION RUN** (sponsored by EIS Alumni Association) — 6:30 pm

WEDNESDAY

- **CONCURRENT SESSION D1:** HIV and Viral Hepatitis — 9:00–10:45 am
- **CONCURRENT SESSION D2:** Respiratory Diseases — 9:00–10:45 am
- **BREAK** — 10:45–11:15 am
- **CONCURRENT SESSION E1:** Occupational Health — 11:15 am–12:40 pm
- **CONCURRENT SESSION E2:** Pediatric Vaccines and Infections — 11:15 am–12:40 pm
- **LUNCH** (on your own) — 12:40–1:40 pm
- **SESSION F:** Alexander D. Langmuir Lecture — 1:40–3:10 pm
- **BREAK** — 3:10–3:40 pm
- **CONCURRENT SESSION G1:** Notes from the Field — 3:40–5:05 pm
- **CONCURRENT SESSION G2:** Social Determinants of Health — 3:40–5:05 pm
- **SESSION H:** FETP INTERNATIONAL NIGHT (sponsored by TEPHINET) — 5:30 pm
- **EISAA WELCOME TO THE FAMILY AND ANNUAL MEETING** (private event–EIS officers and alumni are welcome) — 5:30 pm

THURSDAY

- **CONCURRENT SESSION I1:** Vector-Borne Diseases — 9:00–10:25 am
- **CONCURRENT SESSION I2:** Injury and Overdose Prevention — 9:00–10:25 am
- **BREAK** — 10:25–10:55 am
- **SESSION J:** J. Virgil Peavy Memorial Award Finalists — 10:55 am–12:20 pm
- **LUNCH** (on your own) — 12:20–1:20 pm
- **CONCURRENT SESSION K1:** Zoonoses — 1:20–2:45 pm
- **CONCURRENT SESSION K2:** Vaccine-Preventable Diseases — 1:20–2:45 pm
- **BREAK** — 2:45–3:15 pm
- **SESSION L:** Donald C. Mackel Memorial Award Finalists — 3:15–5:00 pm
- **POST-CONFERENCE EIS SATIRICAL REVIEW** — 7:00 pm

FRIDAY

- **CONCURRENT SESSION M1:** Antimicrobial Use and Hard-to-Treat Infections — 9:00–10:45 am
- **CONCURRENT SESSION M2:** Public Health Surveillance — 9:00–10:45 am
- **BREAK** — 10:45–11:15 am
- **CONCURRENT SESSION N1:** Mpox and Syphilis — 11:15 am–12:40 pm
- **CONCURRENT SESSION N2:** Nutrition — 11:15 am–12:40 pm
- **LUNCH** (on your own) — 12:40–1:40 pm
- **TED-STYLE TALK SESSION 2** — 1:40–2:45 pm
- **BREAK** — 2:45–3:15 pm
- **SESSION O:** Late-Breaking Reports — 3:15–4:20 pm
- **PRESENTATION OF AWARDS** — 4:20–4:50 pm
- **CLOSING REMARKS** — 4:50–5:00 pm

Awards presented during this session

EIS 2025

SAVE the DATE

April 21-24

Atlanta, Georgia

Badge Color Key

- **EIS & LLS Alumni**
- **Current EIS Officers & LLS Fellows**
- **Incoming EIS Officers & LLS Fellows**
- **Conference Participants**
- **Conference Staff**
- **Recruiters**
- **Media**

MEDIA

IF YOU WOULD LIKE TO SPEAK WITH ANY OF THE CONFERENCE PRESENTERS CONTACT:

MELISSA BROWER
EIS Public Affairs
Call/text: (404) 903-0241
Email: ggk5@cdc.gov











EIS 2024

Contents

EIS Conference 2024 Preface

Dear Conference Participants,

Welcome to the 2024 conference of CDC's Epidemic Intelligence Service (EIS). All scientific sessions, TED-style talks, and the Langmuir lecture are available for online viewing as to make EIS more accessible to potential applicants and the public health workforce. The conference is an opportunity for EIS officers to share their work and refine their scientific communication skills. For conference participants, the sessions are an opportunity to learn from the officers' analyses, investigations, and their practice of consequential epidemiology.

This year is the 70th anniversary of the first women in EIS. The EIS program was established in 1951 and the first women were part of the class of 1954. Of the 32 officers in the class of 1954, five or 16% were women. Today, 78% or 135 of the 172 officers in the EIS classes of 2022 and 2023 are women. A special thanks to Dr. Maryam Haddad (EIS class of 2021) for making us aware of the anniversary and for her research about the first women in EIS.

The increasing number of women in EIS is one of the many ways the program has become more diverse over the years. We remain committed to organizational change to expand awareness of the program, increase the diversity of our pool of applicants, refine how we select officers to minimize bias and discrimination, and how we train and prepare EISOs. Our greater diversity results in the EIS program being better prepared to respond to increasingly complex public health challenges.

Our Branch's programs are part of a pathway for strengthening the public health workforce. Our entry way on the path is our Science Ambassador Fellowship where we work with educators to use NERD Academy to introduce middle and high school students to public health. We ask that you encourage your local schools to use NERD Academy to inspire more kids to pursue careers in public health. Next on the pathway is our Epidemiology Elective Program (EEP). EEP allows medical and veterinary students to do a 6–8-week elective rotation with a CDC program or state or local public health department. We also support CSTE's Applied Epidemiology Fellowship (AEF). AEF is a 2-year on-the-job applied epidemiology training program placing MPH level fellows with state or local health departments. EIS and the Laboratory Leadership Service (LLS) are our Disease Detective training programs at the far end of the path. Our expectation is that our multiple programs and commitment to recruiting and training a diverse workforce are creating an accessible pathway to strengthening the public health workforce. You can learn more about the range of training opportunities at our Fellowships and Training Opportunities site.

We thank you for joining us for the conference. We hope you leave energized to act based on something you learned this week or because of someone you interacted with at EIS conference.

Respectfully,

CAPT Eric Pevzner
Branch Chief, EIS

Beth Lee
Deputy Chief

Dr. Wences Arvelo
Associate Chief for Science

EIS Alumni Association

The EIS Alumni Association (EISAA) represents more than 4,500 alumni leading the front lines of public health at local, state, federal, and global levels, both public and private sectors. The association was first established in the 1960s by a group of alumni interested in staying closely connected to the EIS program. The mission of EISAA is to **strengthen the public health workforc**e by growing the diversity, equity, inclusion, accessibility and belonging across EISAA and all of its programs; to build and strengthen **connection** between all EIS alumni and officers; and to **support and celebrate** the work of EIS alumni and officers in public health leadership. At EIS Conference, EISAA sponsors several prestigious awards, hosts alumni networking events, and carries on treasured EIS traditions throughout conference week.

The EIS Alumni Association, in partnership with the CDC Foundation, awards the ***Alexander D. Langmuir Prize***, named in honor of the beloved founder of the EIS; and the ***Stephen B. Thacker Excellence in Mentoring Award*** initiated in 2013 in honor of Dr. Stephen Thacker, an inspirational leader who championed the EIS program and its officers throughout his career.

In addition, the EISAA helps support the ***Distinguished Friend of EIS Award*** honoring an individual who has provided exceptional support to EIS Program; the ***J. Virgil Peavy Memorial Award*** named in honor of a distinguished CDC statistician and EIS mentor; the ***Philip S. Brachman Award***, named in honor of the distinguished director of the EIS (1970-1981); and the ***Outstanding Poster Presentation Award***.

Each year, EISAA also provides competitive travel scholarships for prospective applicants to attend the EIS Conference through the ***David J. Sencer Scholarship Award***. EISAA also helps support EIS Conference events such as the ***Prediction Run*** and ***Skit Night***.

This year our **Career Committee** has hosted several interesting sessions featuring EIS alumni on various career paths after EIS. In the coming months we will be relaunching our student **mentoring program** which will match current students with EIS alumni to help build a stronger and more diverse pathway to EIS. We will also be launching a virtual collection of stories (in the style of **StoryCorps**) from alumni which we hope to gather to share with you all and the public to highlight the strong work of our alumni and the impact that EIS has had on public health. In the coming year, we'd like to focus on **building up our alumni community** with better and more frequent communication, more opportunities for networking and social events, and more opportunities to help you get involved with EIS alumni in ways that speak to you. Stay tuned for ways to get involved in all of these projects!

If you haven't already made a contribution to EISAA this year, please consider doing so TODAY! Here's how you can get involved:

- **Support the EISAA Now!** You can pay your dues and make a contribution to the EIS Fund online at www.eisalumni.org. Recurring donation and planned giving options such as payments from donor-directed funds, IRAs and Employer matches are available! Learn more about this year's fundraising effort, ***Paying It Forward*** and the kick off of a ***new EISAA Endowment, Leading the Way*** at https://eisalumni.org/s/2024-eisaa-leadership-campaign.
- **Stay Connected!** If you are an EIS alumnus/ae and need login instructions for the NEW alumni portal, please email to eisalumni@cdcfoundation.org. This information will guide you on how to log-on to the password protected alumni portal and update your contact information and alumni profile.
- **Learn More!** Join us for our EISAA Reception and Annual meeting on Wednesday, April 24, 2024 at 5:30 p.m. ET at the Conference hotel.

We are delighted to see you all again in person and virtually! We hope all EIS alumni and officers will use this conference week to join us in building our alumni community and supporting the premier public health training program in the world!

Sincerely,

Lisa Oakley, PhD, MPH, EIS '18
President, EIS Alumni Association

Diana Robelotto Scalera
Director of Alumni Affairs/EISAA Liaison, CDC Foundation

2024 Scientific Planning Committee

Front Row: Mary Choi, Suzanne Beavers, Jennifer Liang, Duong Tony Nguyen, Brian Kit, Shane Jack, Xia Michelle Lin, Lindsay Womack
Back Row: Grace Marx, Kathryn Curran, Julia Gargano, Robyn Cree, Ethan Fechter-Leggett, Jennifer Wright, Andrea Winquist, John Rossow
Not Pictured: Laura Reynolds

2023–2024 SPC Members

Duong Tony Nguyen
Chair
National Center for Health Statistics

Jennifer Liang
Co-Chair
National Center for State, Tribal, Local, and Territorial Public Health Infrastructure and Workforce, Epidemiology and Laboratory Workforce Branch

John Rossow
Global Health Center

Robyn Cree
National Center on Birth Defects and Developmental Disabilities

Lindsay Womack
National Center for Chronic Disease Prevention and Health Promotion

Mary Cho and Grace Marx
National Center for Emerging and Zoonotic Infectious Diseases

Andrea Winquist
National Center for Environmental Health / Agency for Toxic Substances and Disease Registry

Brian Kit
National Center for Health Statistics

Kathryn Curran
National Center for HIV, Viral Hepatitis, STD, and TB Prevention

Julia Gargano
National Center for Immunization and Respiratory Diseases

Shane Jack
National Center for Injury Prevention and Control

Suzanne Beavers and Jennifer Wright
National Center for State, Tribal, Local, and Territorial Public Health Infrastructure and Workforce, Epidemiology and Laboratory Workforce Branch–Field

Ethan Fechter-Leggett and Laura Reynolds
National Institute for Occupational Safety and Health
and
Office of Minority Health

Xia Michelle Lin
Office of Public Health Data, Surveillance, and Technology
and
Center for Preparedness and Response

General Information

Program Production

- EIS program
- CMI AUDIOVISUAL

Acknowledgments/Disclaimers

The EIS program extends a special thank you to the EIS Alumni Association and the Council of State and Territorial Epidemiologists for their generous support of the 2024 EIS Conference. The EIS program gratefully acknowledges the valuable assistance and cooperation of the editorial and support staff of all CDC administrative units participating in the EIS conference.

Abstracts in this publication were edited and officially cleared by the respective national centers. Therefore, the EIS program is not responsible for the content, internal consistency, or editorial quality of this material. Use of trade names throughout this publication is for identification only and does not imply endorsement by the U.S. Public Health Service or the U.S. Department of Health and Human Services.

The findings and conclusions in these reports are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Purpose Statement

The primary purpose of the EIS conference is to provide a forum for EIS officers to deliver scientific presentations, increase their knowledge of recent investigations and the significance to public health, and maintain and increase their skills in determining the appropriateness of epidemiologic methods, presenting and interpreting results clearly, and developing appropriate conclusions and recommendations.

Overall Conference Goals

- To provide a forum for EIS officers, alumni, and other public health professionals to engage in the scientific exchange of current epidemiologic topics
- To highlight the breadth of epidemiologic investigations
- To provide a venue for recruitment of EIS graduates into leadership positions at CDC and state and local departments of health

WE WANT

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2024 EIS CONFERENCE

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(Different from continuing Education Survey)

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CM4767- 2024 EPIDEMIC INTELLIGENCE SERVICE (EIS) CONFERENCE (IN PERSON & VIRTUAL)

VISIT TCEO (WWW.CDC.GOV/GETCE) AND FOLLOW THE "9 SIMPLE STEPS TO GET CE."

THE DEADLINE TO COMPLETE CE IS MAY 27, 2024.

CE INFORMATION IS AVAILABLE AT:

WWW.CDC.GOV/EIS/CONFERENCE/CONTINUING-EDUCATION.HTML

THERE ARE NO FEES FOR CE.

2024 Epidemic Intelligence Service (EIS) Conference

Agenda

TUESDAY, APRIL 23, 2024

8:30–9:00 **Welcome and Call to Order**

9:00–10:45 **SESSION A: Stephen B. Thacker Opening Session**

Moderators: Les Dauphin & Deb Houry

9:05 *Stenotrophomonas maltophilia* Bloodstream Infection Outbreak in an Acute Care Hospital — Alameda County, California 2022–2023. *Sana Khan*

9:25 Underlying Medical Conditions and Rate of Influenza-Associated Hospitalization Among Adults — VISION-Flu Network, 2016–17 to 2019–20. *Aaron Frutos*

9:45 Syndromic Surveillance for Case Detection in a Varicella Outbreak Among Recent Immigrants in New York City, 2023. *Melanie Askari*

10:05 Trends in Prescription Medication, Polypharmacy, and Potentially Inappropriate Medication Use Among Adults Aged 65 and Older — United States, 1999–2020. *Gabriel Innes*

10:25 Willingness to Use HIV Pre-Exposure Prophylaxis Among HIV-Serodifferent Couples in Seven African Countries, 2019–2022. *J. Danielle Sharpe*

10:45–11:15 **BREAK**

11:15–12:40 **CONCURRENT SESSION B1: Climate and Health**

Moderators: Tony Nguyen & Ari Bernstein

11:20 When Temperatures Rise: Assessing the Association Between Daily Maximum Temperature and Nonfatal Assault Hospitalizations in New York City, 2016–2021. *Yoon-Sung Nam*

11:40 Rapid Needs Assessment of Households Affected by Flash Flooding — Riverside County, California, September 2023. *Bethan Swift*

12:00 Emergency Department Visits for Acute Myocardial Infarction During the Canadian Wildfires — United States, April 30–August 4, 2023. *Essi Havor*

12:20 Using Syndromic Surveillance for Heat-Related Illness in North Carolina (2009–2023) to Evaluate Local Interventions. *Camden Gowler*

11:15–12:40 **CONCURRENT SESSION B2: Complex Healthcare-Associated Investigations |**

Moderators: Ermias Belay & Mike Bell

11:20 Tuberculosis Infection and Disease After Surgical Implantation of Contaminated Bone Tissue Allografts — Nine U.S. States, 2023. *Paula Williams*

11:40 Transmission of *Ehrlichia chaffeensis* Infection from an Organ Donor to a Transplant Recipient — Wisconsin, United States, October, 2023. *Ann Carpenter*

12:00 Lymphocytic Choriomeningitis Virus Infection in Two Solid Organ Transplant Recipients — United States, 2023. *Kami Smith*

12:20 Cluster Investigation of Nontuberculous Mycobacteria Infections After Cosmetic Surgery Procedures — Florida, 2022–2023. *Katharine Saunders*

12:40–1:40 **LUNCH**

1:40–2:45 **SARAH LUNA MEMORIAL TED-STYLE TALK SESSION 1**

2:45–3:15 BREAK

3:15–5:00 CONCURRENT SESSION C1: Global Health

Moderators: John Rossow & Carl Reddy

3:20 Consecutive Seasonal Epidemics of Bacterial Meningitis — Zinder Region, Niger, 2020–2023. *Isha Berry*

3:40 A Gastrointestinal Anthrax Outbreak in a Rural Tribal Community Linked to Consumption of Ill Livestock Meat, Koraput District, Odisha, India, May 2023. *Amit Pritam Swain, FETP resident*

4:00 Hpv Vaccine Knowledge and Attitudes Among Healthcare Providers Before Introduction to National Schedule, Kazakhstan. *Feruza Ablimitova, FETP resident*

4:20 HIV Risk Factors, Testing, Diagnosis, Use of Prevention Methods, and Violence by Disability Status Among Adolescent Girls and Young Women — Eswatini, 2022. *Ghenet Besera*

4:40 Longitudinal Virologic Outcomes of Adults With HIV on Tenofovir, Lamivudine, and Dolutegravir in Federal Capital Territory, Nigeria, 2017–2023. *Olutomi Sodeke*

3:15–5:00 CONCURRENT SESSION C2: Environmental Health

Moderators: Andrea Winquist & Chris Reh

3:20 Association of Social Vulnerability and Acute Releases of Toxic Substances Incidents — United States, 2010–2014. *Marisol Valenzuela Lara*

3:40 Clinical Characteristics and Factors Associated With Hospitalization During the Largest Documented Blastomycosis Outbreak in the United States — Delta County, Michigan, 2023. *Ian Hennessee*

4:00 Jetted Baptismal Font Linked to a Legionellosis Outbreak — Tennessee, April–May 2023. *Christine Thomas*

4:20 *Pseudomonas* Infection Outbreak Associated With a Hotel Swimming Pool — Maine, March 2023. *Liz Lamere*

4:40 Community Assessment of Chemical Exposure After a Train Derailment — East Palestine, Ohio and Darlington, Pennsylvania, February–March 2023. *Melissa Dulcey*

6:30 PREDICTION RUN (*Sponsored by EIS Alumni Association*)

WEDNESDAY, APRIL 24, 2024

9:00–10:45 CONCURRENT SESSION D1: HIV and Viral Hepatitis

Moderators: Katie Curran & Alexa Oster

9:05 HIV Cluster Among Gay, Bisexual, and Other Men Who Have Sex With Men — Alaska, 2023. *Rini Jose*

9:25 Hypertension Prevalence and Control Among People With and Without HIV — United States, 2022. *Xingran Weng*

9:45 Hepatitis C Virus Treatment Initiation Among Adults Enrolled in Medicaid — Wisconsin, 2015–2022. *Musheng Alishahi*

10:05 Rural-Urban Differences in HIV Care Outcomes in the Southern United States, 2019. *Barbara Keino*

10:25 Improvements in Hepatitis C Cure and Clearance Rates Among Persons With Hepatitis C Mono-Infection and HIV Coinfection — Philadelphia, 2015–2022. *Marissa Tan*

9:00–10:45 **CONCURRENT SESSION D2: Respiratory Diseases**

Moderators: Jennifer Liang & Manisha Patel

9:05 Bottleneck and Enabler Evaluation of Avian Influenza Health Event — Guatemala, January–February 2023. *Parsa Bastani*

9:25 Severe Influenza Among Adults and Children Presenting to the Emergency Department for Influenza-Associated Acute Respiratory Illness, 2022–2023. *Noah Kojima*

9:45 Evaluation of Angelenos in Action: A Text Message-Based Syndromic Surveillance System for Respiratory Illness — Los Angeles County, 2020–2023. *Jordan Braunfeld*

10:05 Duration of Influenza Illness Among Children Aged <18 Years Dying of Influenza — California, 2004–2023. *Sophie Zhu*

10:25 Goal! Goal! Goal! Detection of SARS-CoV-2 Variants in Travelers During the FIFA World Cup, Qatar 2022 — CDC Traveler-Based Genomic Surveillance Program, November 2022–January 2023. *Katrina Byrd*

10:45–11:15 **BREAK**

11:15–12:40 **CONCURRENT SESSION E1: Occupational Health**

Moderators: R. Reid Harvey & Marie de Perio

11:20 Serum Concentrations of Per- and Polyfluoroalkyl Substances Among Firefighters in the Arizona Healthcare, Emergency Responder, and Other Essential Worker Study — Arizona, July 27, 2020–April 15, 2023. *Cedar Mitchell*

11:40 Urine Antigen Screening During an Occupational Blastomycosis Outbreak — Michigan, 2023. *Perri Callaway, LLS Fellow*

12:00 Sociodemographic Characteristics Associated With COVID-19 Bivalent Vaccine Uptake Among U.S. Healthcare Personnel Who Presented for COVID-19 Testing — Emerging Infections Program, United States, September 8, 2022–May 22, 2023. *Elizabeth Slocum*

12:20 Prevention Practices, Associated Barriers, and Training Opportunities to Reduce Tickborne Disease Among Public Outdoor Workers — New Jersey, 2023. *Emma Price*

11:15–12:40 **CONCURRENT SESSION E2: Pediatric Vaccines and Infections**

Moderators: Michelle Lin & Priti Patel

11:20 Human Papillomavirus Vaccination Coverage Among Girls and Boys in the United States: a Birth Year Cohort Analysis of the National Immunization Survey-Teen, 2016–2022. *Ponesai Nyika*

11:40 Long-Term Rotavirus Vaccine Effectiveness Against Emergency Department Visits and Hospitalizations Among Children Seeking Care for Acute Gastroenteritis at New Vaccine Surveillance Network Sites, United States, 2009–2022. *Alpha Oumar Diallo*

12:00 Risk Factors Associated With Pediatric Acute Gastroenteritis Mortality Globally, 2007–2022. *Mary Moran*

12:40–1:40 **LUNCH**

1:40–3:10 **SESSION F: Alexander D. Langmuir Lecture**

3:10–3:40 **BREAK**

3:40–5:05 **CONCURRENT SESSION G1: Notes from the Field**

Moderators: Suzanne Beavers & Janet Hamilton

3:45 Mpox Among Group Sex Event Attendees — Seattle, Washington, 2023. *Amy Xie*

4:05 Changes to STEC Surveillance During the COVID-19 Pandemic and its Impact on Public Health Investigations in New York City, January 2017–September 2022. *John Croft, CSTE Applied Epidemiology fellow*

4:25 Neurosyphilis, Ocular and Otic Syphilis Cases — Chicago, Illinois, January–August 2023. *Amy Nham*

4:45 COVID-19 Outbreak at the Epidemic Intelligence Service Conference — Georgia, April–May 2023. *Dylan Proctor*

3:40–5:05 **CONCURRENT SESSION G2: Social Determinants of Health**

Moderators: Lindsay Womack & Leandris Liburd

3:45 Differences in the Prevalence of Subjective Cognitive Decline by Social Determinants of Health and Health-Related Social Needs — 15 States, 2022. *DaJuandra Eugene*

4:05 Social Determinants of Health Disparities in Lung Cancer Survival — United States, 2010–2019. *Christine Kava*

4:25 Legionnaires' Disease Case Exposure Classification Differs by Race and Ethnicity and Neighborhood Health — California, 2011–2021. *Cassandra Schember*

4:45 Sociodemographic Characteristics of Communities With Differing Strengths of Complete Streets Policies, 2019–2022. *Farah Mouhanna*

5:30 **SESSION H: FETP International Night: (*Sponsored by TEPHINET*)**

5:30 **EISAA Welcome To The Family And Annual Meeting (*Private event: EIS officers and alumni welcome)***

THURSDAY, APRIL 25, 2024

9:00–10:25 **CONCURRENT SESSION I1: Vector-Borne Diseases**

Moderators: Marion Carter & Chris Braden

9:05 Locally Acquired Mosquito-Transmitted Malaria — U.S., May–October, 2023. *Erika Wallender*

9:25 Powassan Virus and Eastern Equine Encephalitis Virus Seroprevalence in Endemic Areas — United States, 2019–2020. *Hannah Padda*

9:45 Increased Tularemia Incidence Linked to Reporting of Probable Cases — United States, 2011–2022. *Shannan Rich*

10:05 Chagas Disease Burden in a Border County — San Diego County, 2018–2023. *Audrey Kennar*

9:00–10:25 **CONCURRENT SESSION I2: Injury and Overdose Prevention —**

Moderators: Shane Jack & Allison Arwady

9:05 Characterizing Intent of Firearm Injuries by Number of Bullet Wounds–National Violent Death Reporting System, 49 States, the District of Columbia, and Puerto Rico — 2003-2021. *Saskia Vos*

9:25 Characterizing Kentucky's Syringe Services Programs, 2018–2022. *Oshea Johnson*

9:45 Spatial Analysis of Social Vulnerability and Firearm Injuries in King County, Washington, 2019–2023. *Precious Esie*

10:05 Nonfatal Injuries Among Skilled Nursing and Residential Care Facility Workers Treated in U.S. Emergency Departments, 2015–2021. *Nadia Saif*

10:25–10:55 **BREAK**

10:55–12:20 **SESSION J: J.Virgil Peavy Memorial Award Finalists**

Moderators: Byron Robinson & Andrea Young

11:00 Use of Bayesian Statistics and Artificial Intelligence to Develop an Algorithm for Asyndromic Anomaly Detection in Emergency Department Visit Records — New Jersey, December 2020–August 2022. *Anna Bratcher*

11:20 The Covariate Adjusted Logit Model: A Novel Statistical Method for Generating Immunologic Protection Thresholds and an Application to a Group B *Streptococcus* Case Control Study — United States, 2010–2022. *Rebecca Kahn*

11:40 Small Area Estimation of Subdistrict Diabetes Prevalence — U.S. Virgin Islands, 2021–2022. *Katie Labgold*

12:00 Latent Class Analysis Identifies Clusters of Clinical Presentation and Severity Among Children With Multisystem Inflammatory Syndrome — United States, February 2020–December 2022. *Kevin Ma*

12:20–1:20 LUNCH

1:20–2:45 CONCURRENT SESSION K1: Zoonoses

Moderators: Jennifer Wright & Fernando Torres-Velez

1:25 Human Case of Leptospirosis During a Canine Outbreak — Wyoming, 2023. *Brittney Waranius*

1:45 Multidisciplinary Approach to Investigating *Brucella canis* Exposures in South Carolina, September 2023. *Tori Moore*

2:05 In Search of Cryptic Bat Rabies Virus in Puerto Rico — A Novel Surveillance Approach. *Andrew Beron*

2:25 Using a One Health Approach to Investigate an Outbreak of *Streptococcus equi zooepidemicus* Among Shelter Dogs in Pima County, Arizona — January 9–February 21, 2023. *Cedar Mitchell*

1:20–2:45 CONCURRENT SESSION K2: Vaccine-Preventable Diseases

Moderators: Julia Gargano & Demetre Daskalakis

1:25 Varicella Outbreak Among Asylum Seekers in New York City, 2022–2023. *Leah Seifu*

1:45 Effectiveness of the 2022–23 Influenza Vaccine Against Influenza Infection and Illness. *Elizabeth White*

2:05 Expanding RSV-Associated Hospitalization Surveillance — Colorado, October 1, 2022–May 20, 2023. *Cara Drehoff*

2:25 Declines in Human Papillomavirus Vaccine Types 16 and 18 in Cervical Precancers — United States, 2008–2019. *Ruth Stefanos*

2:45–3:15 BREAK

3:15–5:00 SESSION L: Donald C. Mackel Memorial Award Finalists

Moderators: Tara Henning & Les Dauphin

3:20 Extensively Drug-Resistant *Pseudomonas aeruginosa* Associated With Contaminated Artificial Tears — Multiple States, 2022–2023. *Marissa Grossman*

3:40 Prevalence of Previous Dengue Infection Among School Children in Grades 3–10 — American Samoa, September–October 2023. *Sandra Kiplagat*

4:00 Enhanced Surveillance and Vaccination of Wildlife for Detection and Management of Raccoon Rabies Virus Variant — Omaha, Nebraska, October–November 2023. *Sydney Stein*

4:20 Duration of Type 2 Poliovirus Memory B Cells Amongst Children Receiving Oral and Inactivated Poliovirus Vaccines — Bangladesh, 2016–2018. *Scarlett Lee*

4:40 Second Multistate Tuberculosis Outbreak Caused by Contaminated Bone Tissue Allograft — Nine U.S. States, 2023. *Kimberly Schildknecht*

7:30 POST-CONFERENCE EIS SATIRICAL REVIEW

FRIDAY, APRIL 26, 2024

9:00–10:45 **CONCURRENT SESSION M1: Antimicrobial Use and Hard-to-Treat Infections —**
Moderators: Wences Arvelo & Peggy Honein

9:05 COVID-19-Associated Invasive Mold Infections in an Active Surveillance System — 3 Hospitals, Atlanta, Georgia, 2020–2021. *Elizabeth Sajewski*

9:25 Antibiotic Prescribing by General Dentists in the Outpatient Setting — United States, 2018–2022. *Cam-Van Huynh*

9:45 First Identified *Candida auris* Outbreak Among Patients at a Long-Term Acute Care Hospital in Columbus, Ohio — October 2023. *Elizabeth Tiller*

10:05 Outbreak of New Delhi Metallo-beta-Lactamase-Producing *Klebsiella pneumoniae* — New Hampshire, 2023. *Steven Langerman*

10:25 Canine Cases of Carbapenemase-Producing Carbapenem-Resistant *Pseudomonas aeruginosa* Associated With a Multistate Outbreak Linked to Artificial Tears — New Jersey, 2023. *Emma Price*

9:00–10:45 **CONCURRENT SESSION M2: Public Health Surveillance**
Moderators: Robyn Cree & Deron Burton

9:05 Multistate Foodborne Illness Outbreaks Associated With Nuts and Seeds — United States, 1998–2022. *Gabriel Innes*

9:25 Evaluation of SARS-CoV-2 Genomic Surveillance — New York City, 2023. *Roisin McElroy*

9:45 Evaluating the Metropolitan Atlanta Congenital Defects Program's Surveillance System for Birth Defects Study to Evaluate Pregnancy exposureS Eligible Cases–Atlanta, Georgia, 2016–2022. *Rachel Alade*

10:05 Invasive Group B Streptococcal Disease Among Non-Pregnant Adults — Alaska, 2000–2021. *Victoria Balta*

10:25 Improving Pregnancy-Associated Death Identification in Wyoming. *Michelle Azar, CSTE Applied Epidemiology fellow*

10:45–11:15 **BREAK**

11:15–12:40 **CONCURRENT SESSION N1: Mpox and Syphilis**
Moderators: Grace Marx & Lindley Barbee

11:20 Mpox Among Persons Who Self-Identified as Men Who Have Sex With Men or as Transgender, Stratified by Reported Housing Status and Participation in Exchange Sex: A Multijurisdictional Case-Control Study — United States, August 19, 2022–September 12, 2023. *Caroline Waddell*

11:40 Evolving Trends of an Accelerating Syphilis Epidemic — Alaska, 2018–2022. *Julia Rogers*

12:00 Factors Contributing to Congenital Syphilis and Missed Opportunities for Prevention — Clark County, Nevada, 2017–2022. *Jessica Penney*

12:20 Enhanced Mpox Surveillance With GeneXpert Molecular Diagnostic Testing Systems — Tshuapa and Tshopo Provinces, Democratic Republic of Congo, 2022-2023. *Victoria Shelus*

11:15–12:40 **CONCURRENT SESSION N2: Nutrition**

Moderators: Brian Kit & Carolyn Greene

11:20 Progress and Disparities in Breastfeeding Rates by Race and Ethnicity, National Immunization Survey-Child — United States, 2010–2020 Births. *Adi Noiman*

11:40 Substitution Preferences for Sugar-Sweetened Beverages Among Adults by Sociodemographic Characteristics–United States, 2021. *Alexander Molinari*

12:00 Factors Predicting Red Blood Cell Folate Insufficiency Among Women of Reproductive Age, NHANES, 2007–2020. *Amy Fothergill*

12:20 Trends in Milk Consumption Among Youth and Adults — United States, 2009–2010 Through 2017–March 2020. *Samuel Emmerich*

12:40–1:40 **LUNCH**

1:40–2:45 **TED-STYLE TALK SESSION 2** — ***Moderator: Sonnet Gaertner***

2:45–3:15 **BREAK**

3:15–4:20 **SESSION O: Late-Breaking Reports**

Moderators: Eric Pevzner & Nirav Shah

3:20 Norovirus Outbreak at a Manhattan Restaurant — New York City, December 2023. *Leah Seifu*

3:30 Supplemental Immunization Activity Response Timeliness for Circulating Vaccine-Derived Poliovirus Outbreaks — Worldwide, 2016–2023. *Keri Geiger*

3:40 Fatal Orthopoxvirus Infection in an Immunosuppressed Hospitalized Patient — Alaska, 2023. *Julia Rogers*

3:50 Response to Measles in an International Traveler — Colorado, December 2023. *Cara Drehoff*

4:00 Local Response to the First Case of Locally Acquired Dengue Infection in California — Pasadena, California, 2023. *Rudy Patrick*

4:20–4:50 **Presentation of Awards**

4:50–5:00 **CLOSING REMARKS**

Awards presented during this session

Awards Descriptions and Committee Members

Alexander D. Langmuir Prize Manuscript Award

The Alexander D. Langmuir Prize, established in 1966 by the EIS Alumni Association and sponsored by Joanna Buffington, EIS '90 in partnership with the CDC Foundation, encourages EIS officers to publish papers based on epidemiologic work done while in the EIS. This prize recognizes a current EIS officer or recent alumnus (1 year) for excellence in a written report or an epidemiologic investigation or study.

2024 Committee Members: Lisa Oakley (Chair), Evelyn Twentyman, Amanda Garcia Williams, Ariella Dale, Linda Bartlett, Matthew Cartter, Jennifer Cope, Mark Dworkin, Shannon Hader, William "Bill" Halperin, Lindsey Shields, Rachael Zacks, Allison Siu

Philip S. Brachman Award

The Philip S. Brachman Award, sponsored by the graduating class of EIS officers and the EIS Alumni Association, recognizes excellence in teaching epidemiology to EIS officers.

2024 Committee Members: Forrest Jones, Barbara Keino, Daniel Nguyen, Adam Rowh

Anne Schuchat Distinguished Friend of EIS Award

The Anne Schuchat Distinguished Friend of EIS Award, sponsored by the EIS Alumni Association, recognizes an individual for valued contributions that have made an important difference to the health, welfare, and happiness of EIS officers and the EIS program.

2024: Eric Pevzner oversees this award.

Iain C. Hardy Award

The Iain C. Hardy Award, sponsored by the National Center for Immunization and Respiratory Diseases in partnership with the CDC Foundation, recognizes a current EIS officer or alumnus (within 5 years) who has made an outstanding contribution to the control of vaccine preventable diseases.

2024 Committee Members: Alexandre Macedo De Oliveira (Chair), Melinda Wharton, Mona Marin, Robert Linkins, Cristiana Toscano, William Schaffner

J. Virgil Peavy Memorial Award

The J. Virgil Peavy Memorial Award, established in 2003 and sponsored by the EIS Alumni Association, recognizes a current EIS officer for the oral presentation that best exemplifies the effective and innovative application of statistics and epidemiologic methods in an investigation or study.

2024 Committee Members: Xia Michelle Lin (Chair), Brian K. Kit, Shane P. Jack, Josip Derado, Yang Liu

Donald C. Mackel Memorial Award

The Donald C. Mackel Memorial Award, created by the EIS Alumni Association in partnership with the CDC Foundation, recognizes a current EIS officer for the oral presentation that best exemplifies the effective application of a combined epidemiology and laboratory approach to an investigation or study.

2024 Committee Members: Grace Marx (Chair), Amy Keckler, Josh Rossow, Anna Llewellyn, Julia Gargano

Outstanding Poster Presentation Award

The Outstanding Poster Presentation Award is sponsored by the EIS Alumni Association and presented by the EIS Scientific Program Committee to a current EIS officer for the poster that best exemplifies scientific content, including originality, study design and analysis; public health impact; and presentation effectiveness.

No poster presentations for the 2024 conference.

Paul C. Schnitker International Health Award

Paul C. Schnitker, MD, passed away in a plane crash in Nigeria in 1969. He was en route to serve as a public health officer in the response to a famine and other public health problems resulting from the Biafra Civil War in Nigeria. He is the only person who has died while serving as an EIS officer. The Paul C. Schnitker International Health Award, sponsored by the Schnitker family in partnership with the CDC Foundation, recognizes a current EIS officer who has made a significant contribution to international public health.

2024 Committee Members: Florina Serbenescu (Chair), Kevin Clarke, Almea Matanock, Patrick Dawson

James H. Steele Veterinary Public Health Award

The James H. Steele Veterinary Public Health Award, sponsored by CDC veterinarians in partnership with the CDC Foundation, recognizes a current EIS officer or alumnus (within 5 years) who has made outstanding contributions in the field of veterinary public health through outstanding contributions in the investigation, control, or prevention of zoonotic diseases or other animal-related human health problems.

2024 Committee Members: Ryan Wallace (Chair), Casey Barton Behravesh (Co-Chair), Radhika Gharpure, Kirk Smith, Colin Basler, Caitlin Cossaboom

Mitch Singal Excellence in Occupational and Environmental Health Award

The Mitch Singal Excellence in Occupational and Environmental Health Award, co-sponsored by the National Institute for Occupational Safety and Health and the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry, was established in 2010. The Mitch Singal Award recognizes a current EIS officer for excellence in an oral presentation that best exemplifies the effective application of public health epidemiology to an investigation in the area of occupational or environmental health.

2024 Committee Members: Andrea Winquist (Chair), Laura Reynolds, Jess Rinsky, Maria Mirabelli, Noemi Hall, Alyssa Troeschel, Amy Heinzerling, Larry Cohen, Matt Lozier

Stephen B. Thacker Excellence in Mentoring Award (EISAA)

The Stephen B. Thacker Excellence in Mentoring Award, established in 2013 by the EIS Alumni Association and sponsored by the Thacker family in partnership with the CDC Foundation, recognizes an individual who is an inspiration to the EIS community and exhibits unwavering commitment to the EIS program, officers, and alumni through demonstrated excellence in applied epidemiology training, mentoring, and building public health capacity.

2024 Committee Members: Lisa Oakley (Chair), Amanda Garcia-Williams, Fatima Coronado, Pamela Mahoney, Larry Cohen, Maria Thacker Goethe

Shalon M. Irving Memorial Award

The Shalon M. Irving Health Equity Award, established by the EIS program and sponsored by the EIS Alumni Association, was awarded for the first time in 2018. The Shalon M. Irving Award recognizes a current EIS officer or recent alumni (classes (2020-2023) for having made exemplary contributions in the areas of health equity and racial disparities research.

2024 Committee Members: Lisa Oakley (Chair), Jennifer Lind, Erika Odom, Fran Abanyie, Rashid Njai, Asha Ivey-Stephenson, NaTasha Hollis, Emily Petersen

David J. Sencer Scholarship Award (EISAA)

The David J. Sencer Scholarship Award fund was established by the EIS Alumni Association to provide travel scholarships to potential Epidemic Intelligence Service (EIS) applicants to attend the EIS conference each year. For a list of scholarship recipients, contact EISAA.

2024 Committee Members: Linda Bartlett (Chair), Beth Rubenstein, Kathleen Gensheimer, Matt Carver, Gregory Heath

Alexander D. Langmuir Lectures, 1972–2023

The Langmuir Lecture is the preeminent public health lecture in the United States. The first lecture was given in 1972, and it has been a highlight of the annual EIS conference each year since then. The lecture is named for Alexander D. Langmuir, MD, MPH (1910–1993), a public health visionary and leader who established the Epidemiology Program at what was then called the Communicable Disease Center in 1949; he remained as CDC's chief epidemiologist until his retirement in 1970.

Notably, Dr. Langmuir founded EIS, established national disease surveillance for the United States, and brought the Morbidity and Mortality Weekly Report to CDC. Langmuir Lecture speakers have included Abraham Lilienfeld, Sir Richard Doll, Geoffrey Rose, Jonas Salk, and many other prominent public health thinkers and researchers.

1972 Prevention of Rheumatic Heart Disease — Fact or Fancy.
Charles H. Rammelkamp

1973 Cytomegaloviral Disease in Man: An Ever Developing Problem.
Thomas H. Weller

1974 Hepatitis B Revisited (By the Non-Parenteral Route).
Robert W. McCollum

1975 Origin, Spread, and Disappearance of Kuru: Implications of the Epidemic Behavior of a Disease in New Guineans for the Epidemiologic Study of Transmissible Virus Dementias.
D. Carleton Gajdusek

1976 The Future of Epidemiology in the Hospital.
Paul F. Wehrle

1977 The Historical Evolution of Epidemiology.
Abraham Lilienfeld

1978 The Biology of Cancer: An Epidemiological Perspective.
Sir Richard Doll

1979 The Epidemiology of Antibiotic Resistance.
Theodore C. Eickoff

1980 Health and Population Growth.
Thomas McKeown

1981 The Pathogenesis of Dengue: Molecular Epidemiology in Infectious Disease.
Scott B. Halstead

1982 The Epidemiology of Coronary Heart Disease: Public Health Implications.
Henry W. Blackburn, Jr.

1983 Sexually Transmitted Diseases — Past, Present, and Future.
King K. Holmes

1984 Poliomyelitis Immunization — Past and Future.
Jonas E. Salk

1985 An Epidemiologist's View of Postmenopausal Estrogen Use, or What to Tell Your Mother.
Elizabeth Barrett-Connor

1986 Hepatitis B Virus and Hepatocellular Carcinoma: Epidemiologic Considerations.
Robert Palmer Beasley

1987 Environmental Hazards and the Public Health.
Geoffrey Rose

1988 Lymphotropic Retroviruses in Immunosuppression.
Myron E. (Max) Essex

1989 Aspirin in the Secondary and Primary Prevention of Cardiovascular Disease.
Charles H. Hennekens

1990 Epidemiology and Global Health.
William H. Foege

1991 Public Health Action in a New Domain: The Epidemiology and Prevention of Violence.
Garen J. Wintemute

1992 Helicobacter pylori, Gastritis, Peptic Ulcer Disease, and Gastric Cancer.
Martin J. Blasér

1993 Diet and Health: How Firm Is Our Footing?
Walter C. Willett

1994 Alexander D. Langmuir: A Tribute to the Man.
Philip S. Brachman and William H. Foege

1995 Epidemiology and the Elucidation of Lyme Disease.
Allen C. Steere

1996 50 Years of Epidemiology at CDC.
Jeffrey P. Koplan

1997 Public Health, Population-Based Medicine, and Managed Care.
Diana B. Petitti

1998 Pandemic Influenza: Again?
Robert Couch

1999 The Evolution of Chemical Epidemiology.
Philip J. Landrigan

2000 Does Chlamydia pneumoniae Cause Atherosclerotic Cardiovascular Disease? Evaluating the Role of Infectious Agents in Chronic Diseases.
Walter E. Stamm

2001 Halfway Through a Century of Excellence.
J. Donald Millar

2002 Public Health Response to Terrorism: Rising to the Challenge.
Marcelle Layton

2003 Alex Langmuir's Somewhat Quiet Legacy: Epidemiology, Sexual Health, and Personal Choices.
Willard (Ward) Cates, Jr.

2004 HIV, Epidemiology, and the CDC.
James W. Curran

2005 Killin' Time: Alcohol and Injury.
Alexander C. Wagenaar

2006 Measuring Malaria.
Brian Greenwood

2007 Implications of Tuberculosis Control on Evidence-Based Public Health Practice.
Thomas R. Frieden

2008 Physical Activity and Public Health: Does the Environment Matter?
Ross C. Brownson

2009 Epidemiology, Public Health, and Public Policy.
Jim Marks

2010 Community Health Rankings—Epidemiology in Action.
Pat Remington

2011 Skirmishes, Battles, and Wars: Tracking Infection Control Success in the Age of Social Networks.
Robert A. Weinstein

2012 Prevention of Teen Pregnancy: What Do We Know? Where Do We Go?
Robert Blum

2013 The Role of EIS in Communities of Solution: Using GIS and Epidemiology to Activate Health Partnerships.
Robert Phillips

2014 EIS in an Era of Data, Technology, and Urban Transformations.
Martin-J. Sepulveda

2015 Large-Scale Machine Learning and Its Application to Public Health.
Jeff Dean

2016 From Antibiotic Resistance to Zika: Reflections on Working at the Intersection of Science and Public Health Politics.
Margaret Hamburg

2017 Moving from Epidemiology to Quantitative Population Health Science.
Sandro Galea

2018 Better Health through Better Partnerships.
Vice Admiral Jerome M. Adams

2019 Understanding of history as crucial to moving forward
Mona Hanna-Attisha

2020 No 2020 Langmuir Lecture lecture given due to the COVID-19 pandemic and cancellation of the EIS conference.

2021 History and function of the EIS program
Former CDC Director William H. Foege, MD, MPH

2022 Undoing the Racial pattern of Health
Mary Bassett

2023 Engaging Indigenous Communities to Promote Health Equity
Donald Warne, MD, MPH

Alexander D. Langmuir Prize Manuscripts, 1972–2023

1966 Complications of Smallpox Vaccination: I. National Survey in the United States, 1963. N Engl J Med 1967;276:125–32.
J.M. Neff, J.M. Lane, J.H. Pert, R. Moore, J.D. Millar, D.A. Henderson

1967 An Outbreak of Neuromyasthenia in a Kentucky Factory—The Possible Role of a Brief Exposure to Organic Mercury. Am J Epidemiol 1967;86:756–64.
G. Miller, R. Chamberlin, W.M. McCormack

1968 Salmonellosis from Chicken Prepared in Commercial Rotisseries: Report of an Outbreak. Am J Epidemiol 1969;90:429–37.
S.B. Werner, J. Allard, E.A. Ager

1969 Outbreak of Tick-Borne Relapsing Fever in Spokane County, Washington. JAMA 1969;210:1045–50.
R.S. Thompson, W. Burgdorfer, R. Russell, B.J. Francis

1970 Tularemia Epidemic: Vermont, 1968—Forty-Seven Cases Linked to Contact with Muskrats. N Engl J Med 1969;280:1253–60.
L.S. Young, D.S. Bicknell, B.G. Archer, et al.

1971 Tomato Juice-Associated Gastroenteritis, Washington and Oregon, 1969. Am J Epidemiol 1972;96:219–26.
W.H. Barker Jr., V. Runte

1972 Salmonella Septicemia from Platelet Transfusions: Study of an Outbreak Traced to a Hematogenous Carrier of Salmonella cholerae-suis. Ann Intern Med 1973;78:633–41.
F.S. Rhame, R.K. Root, J.D. MacLowry, T.A. *Dadisman, J.V. Bennett*

1973 Outbreak of Typhoid Fever in Trinidad in 1971 Traced to a Commercial Ice Cream Product. Am J Epidemiol 1974;100:150–7.
A. Taylor Jr., A. Santiago, A.Gonzales-Cortes, E.J. Gangarosa

1974 Oyster-Associated Hepatitis: Failure of Shellfish Certification Programs To Prevent Outbreaks. JAMA 1975;233:1065–8.
B.L. Portnoy, P.A. Mackowiak, C.T. Caraway, J.A. Walker, T.W. McKinley, C.A. Klein Jr.

1975 Staphylococcal Food Poisoning Aboard a Commercial Aircraft. Lancet 1975;2:595–9.
M.S. Eisenberg, K. Gaarslev, W. Brown, M. Horwitz, D. Hill

1976 Nursery Outbreak of Peritonitis with Pneumoperitoneum Probably Caused by Thermometer-Induced Rectal Perforation. Am J Epidemiol 1976;104:632–44.
M.A. Horwitz, J.V. Bennett

1977 Epidemic Yersinia entercolitica Infection due to Contaminated Chocolate Milk. N Engl J Med 1978;298:76–9.
R.E. Black, R.J. Jackson, T. Tsai, et al.

1978 Measles Vaccine Efficacy in Children Previously Vaccinated at 12 Months of Age. Pediatrics 1978;62:955–60.
J.S. Marks, T.J. Halpin, W.A. Orenstein

1979 An Outbreak of Legionnaires' Disease Associated with a Contaminated Air-Conditioning Cooling Tower. N Engl J Med 1980;302:365–70.
T.J. Dondero Jr., R.C. Rendtorff, G.F. Mallison, et al.
and
Risk of Vascular Disease in Women: Smoking, Oral Contraceptives, Noncontraceptive Estrogens, and Other Factors. JAMA 1979;242:1150–4.
D.B. Petitti, J.Wingerd, J. Pellegrin, et al.

1980 Injuries from the Wichita Falls Tornado: Implications for Prevention.
Science 1980;207:734–8.
R.I. Glass, R.B. Craven, D.J. Bregman, et al.

1981 Respiratory Irritation due to Carpet Shampoo: Two Outbreaks. Environ Int 1982;8:337–41.
K. Kreiss, M.G. Gonzalez, K.L. Conright, A.R. Scheere
and
Toxic-Shock Syndrome in Menstruating Women: Association with Tampon Use and Staphylococcus aureus and Clinical Features in 52 Cases. N Engl J Med 1980;303:1436–42.
K.N. Shands, G.P. Schmid, B.B. Dan, et al.

1982 Risk Factors for Heatstroke: A Case-Control Study. JAMA 1982;247:3332–6.
E.M. Kilbourne, K. Choi, T.S. Jones, S.B. Thacker

1983 Epidemic Listeriosis C—Evidence for Transmission by Food. N Engl J Med 1983;308:203–6.
W.F. Schlech III, P.M. Lavigne, R.A. Bortolussi, et al.

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J.W. Buehler, L.F. Smith, E.M. Wallace, C.W. Heath, R. Kusiak, J.L. Herndon
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Medication Errors with Inhalant Epinephrine Mimicking an Epidemic of Neonatal Sepsis. N Engl J Med 1984;310:166–70.
S.L. Solomon, E.M. Wallace, E.L. Ford-Jones, et al.

1985 The Use and Efficacy of Child-Restraint Devices: The Tennessee Experience, 1982 and 1983. JAMA 1984;252:2571–5.
M.D. Decker, M.J. Dewey, R.H. Hutcheson Jr., W.S. Schaffner

1986 The Role of Parvovirus B19 in Aplastic Crisis and Erythema Infectiosum (Fifth Disease). J Infect Dis 1986;154:383–93.
T.L. Chorba, P. Coccia, R.C. Holman, et al.

1987 Oral Contraceptives and Cervical Cancer Risk in Costa Rica: Detection Bias or Causal Association? JAMA 1988;259:59–64.
K.L. Irwin, L. Rosero-Bixby, M.W. Oberle, et al.

1988 A Day-Care–Based Case-Control Efficacy Study of Haemophilus influenzae B Polysaccharide Vaccine. JAMA 1988;260:1413–8.
L.H. Harrison, C. Broome, A.W. Hightower, et al.

1989 Group A Meningococcal Carriage in Travelers Returning from Saudi Arabia. JAMA 1988;260:2686–9.
P.S. Moore, L.H. Harrison, E.E. Telzak, G.W. Ajello, C.V. Broome
and
Transmission of Plasmodium vivax Malaria in San Diego County, California, 1986. Am J Trop Med Hyg 1990;42:3–9
Y.A. Maldonado, B.L. Nahlen, R.R. Roberta, et al.

1990 An Outbreak of Surgical Wound Infections due to Group A Streptococcus Carried on the Scalp. N Engl J Med 1990;323:968–72.
T.D. Mastro, T.A. Farley, J.A. Elliott, et al.

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E.A. Belongia, C.W. Hedberg, G.J. Gleich, et al.

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Retrospective Study of the Impact of Lead-Based Hazard Remediation on Children's Blood Lead Levels in St. Louis, Missouri. Am J Epidemiol 1994;139:1016–26.
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1994 A Massive Outbreak in Milwaukee of Cryptosporidium Infection Transmitted Through the Public Water Supply. N Engl J Med 1994;331:161–7.
W.R. Mac Kenzie, N.J. Hoxie, M.E. Proctor, et al.

1995 A Multistate Outbreak of Escherichia coli 0157:H7-Associated Bloody Diarrhea and Hemolytic Uremic Syndrome from Hamburgers: The Washington Experience. JAMA 1994;272:1349–53
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J. Cortes, A. Curns, J. Tate, M. Cortese, M. Patel, F. Zhou, U. Parashar

2012 Multistate Outbreak of Escherichia coli O157:H7 Infections Associated with In-Store Sampling of a Raw-Milk Gouda Cheese, 2010
J. McCollum, N. Williams, S. W. Beam, et al.

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2014 Raccoon Rabies Virus Variant Transmission Through Solid Organ Transplantation. JAMA 2013;310:398–407.
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2015 New Delhi Metallo-Beta-Lactamase-Producing Carbapenem-Resistant E. coli Associated with Exposure to Duodenoscopes.
Lauren Epstein, MD, MSc and Jennifer C. Hunter, DrPH

2016 Exposure to Advertisements and Electronic Cigarette Use among U.S. Middle and High School Students.
Tushar Singh, MD, PhD, MS

2017 Geospatial Analysis of Household Spread of Ebola Virus in a Quarantined Village — Sierra Leone, 2014.
Brigette L. Gleason, MD, MPH

2018 Educational Disabilities Among Children Born with Neonatal Abstinence Syndrome. Pediatrics. 2018 Sep;142(3).
M.A. Fill, A.M. Miller, R.H. Wilkinson, et al.

2019 Homelessness and Hepatitis A-- San Diego County, 2016-2018
Corey Peak, ScD, MS

2020 Factors Associated with Candida auris Colonization and Transmission in Skilled Nursing Facilities with Ventilator Units, New York, 2016-2018. Clin Infect Dis 2021;72(11):e753–e760.
J. Rossow, B. Ostrowsky, E. Adams, et al.

2021 Presymtomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility.
Melissa Arons

2022 Association Between 3 Doses of mRNA COVID-19 Vaccine and Symptomatic Infection Caused by the SARS-CoV-2 Omicron and Delta Variants.
E.K. Accorsi, A. Britton

2023 School District Prevention Policies and Risk of COVID-19 Among In-Person K–12 Educators, Wisconsin, 2021. *P.M. DeJonge*, *I.W. Pray*, *R. Gangnon*, *et al.*

Philip S. Brachman Awards, 1983–2023

1983 Philip Brachman
1984 Michael Gregg
1985 Howard Ory
1986 J. Lyle Conrad
1987 Andrew G. Dean
1988 Richard C. Dicker
1989 Carl W. Tyler, Jr.
1990 Richard C. Dicker
1991 Richard C. Dicker
1992 Jeffrey J. Sacks
1993 J. Lyle Conrad and Michael Toole
1994 Willard (Ward) Cates and Robert Breiman
1995 John Horan
1996 Polly Marchbanks
1997 William Mac Kenzie
1998 Laura A. Coker
1999 Christine Zahniser
2000 Jeffrey J. Sacks
2001 Douglas H. Hamilton
2002 Marcelle Layton, Steve Weirsma, James L. Hadler, Eddy Bresnitz, Elizabeth Barrett, Robert B. Stroube, Ross J. Brechner, David S.B. Blythe, Larry Siegel, Karyn Berry, Sherri Adams, John Eisold, and Greg Martin
2003 Deborah W. Gould
2004 Jim Alexander
2005 Julie Magri
2006 Ralph Henderson
2007 Joshua Mott and Peter Cegielski
2008 Lisa Pealer

2009 C. Kay Smith and Julie Magri
2010 Betsy Gunnels
2011 William Schaffner
2012 Rachel N. Avchen
2013 Stephen B. Thacker
2014 Douglas H. Hamilton
2015 Julie Magri
2016 Diana Bensyl
2017 Joshua Mott and Michael King
2018 Anne Schuchat
2019 Michael Gronostaj
2020 Eric Pevzner and Tara Henning
2021 Jennifer Liang
2022 Kristine "Kris" Bisgard
2023 Grace Marx

Anne Schuchat Distinguished Friend of EIS Awards, 1984–2023

1984 Virgil Peavy
1985 William Schaffner
1986 Mary Moreman
1987 James Chin
1988 Frances H. Porcher
1989 Not Awarded
1990 J. Lyle Conrad
1991 Alexander D. Langmuir
1992 Laurence R. Foster
1993 Kenneth L. Herrmann and William Roper
1994 Louise McFarland
1995 Mike Osterholm
1996 Jim Curran and Larry Schonberger
1997 Patsy Bellamy
1998 John Horan
1999 Not Awarded
2000 James Hadler
2001 Barbara R. Holloway and William R. Jarvis
2002 Patricia Fleming and Stephen B. Thacker
2003 Paul Blake
2004 David Sencer
2005 Not Awarded
2006 Robert Tauxe and Kashef Ijaz
2007 Dixie Snider
2008 Denise Koo
2009 Arjun Srinivasan
2010 Robert Quick
2011 Thomas Peterman
2012 Jeffrey P. Davis
2013 Douglas H. Hamilton
2014 William Keene
2015 David B. Callahan
2016 Sally Brown
2017 Marcelle "Marci" Layton and Mary Anne Duncan
2018 Robert "Mike" Hoekstra
2019 Janell A. Routh
2020 Jeffrey Engel
2021 Dr. Anne Schuchat
2022 Jim Curran and Michael Iademarco
2023 Korwaski "K" Jeter

Iain C. Hardy Awards, 1996–2023

1996 Peter Strebel
1997 D. Rebecca Prevots
1998 Beth P. Bell
1999 Charles R. Vitek
2000 Linda Quick and Nancy Rosenstein
2001 Orin S. Levine
2002 Umesh D. Parashar
2003 Karen A. Hennessey
2004 Tim Uyeki and Montse Soriano-Gabarro
2005 Julie Jacobson-Bell
2006 Gustavo Dayan
2007 Brendan Flannery
2008 Mona Marin
2009 Amanda Cohn and Rosalyn O'Laughlin
2010 Amy Parker Fiebelkorn
2011 Jacqueline E. Tate
2012 Preeta Kutty
2013 James L. Goodson
2014 Catherine Yen
2015 Minal K. Patel
2016 Eugene Lam
2017 Paul A. Gastañaduy
2018 Robert "Mike" Hoekstra
2019 Jose E. Hagan
2021 Heidi Soeters
2022 Sara Oliver
2023 Rachel M. Burke

J. Virgil Peavy Memorial Awards, 2003–2023

2003 Danice Eaton
2004 Lori A. Pollack
2005 Andrea Sharma
2006 Andrea Sharma
2007 Abhijeet Anand and David Lowrance
2008 Katherine Ellingson
2009 Michael L. Jackson
2010 Erin Murray
2011 Matthew Willis
2012 Noha H. Farag
2013 Alison Laufer
2014 Matthew Maenner

2015 Jin Qin
2016 Christopher Lee
2017 Julie Lynn Self
2018 Elizabeth Soda
2019 Heather Reese
2020 No Award
2021 No Award
2022 Peter DeJonge
2023 Peter DeJonge

Donald C. Mackel Memorial Awards, 1987–2023

1987 Fatal Parathion Poisoning—Sierra Leone.
Ruth A. Etzel

1988 Multistate Outbreak of Legionnaires' Disease Involving Tours to Vermont.
Margaret Mamolen

1989 Nosocomial Outbreak of Legionnaires' Disease Associated with Shower Use: Possible Role of Amoebae.
Robert F. Breiman

1990 Legionnaires' Disease Outbreak Associated with a Grocery Store Mist Machine.
Frank J. Mahoney

1991 Nosocomial Outbreak of Isoniazid- and Streptomycin-Resistant Tuberculosis Among AIDS Patients, New York City.
Brian R. Edlin

1992 Bacillary Angiomatosis, New Infectious Disease: Epidemiology, Clinical Spectrum, and Diagnostics.
Janet C. Mohle-Boetani

1993 Hepatitis B Virus Transmission Associated with Thoracic Surgery, Los Angeles.
Rafael Harpaz

1994 Schistosomiasis and Lake Malawi: A New Site of Transmission Posing a Serious Risk to Expatriates and Tourists.
Martin S. Cetron

1995 Use of Urinary Antigen Testing To Detect an Outbreak of Nosocomial Legionnaires' Disease in Connecticut, 1994.
Lisa A. Lepine

1996 International Outbreak of Salmonella Infections Caused by Alfalfa Sprouts Grown from Contaminated Seed.
Barbara E. Mahon
and
Malassezia pachydermatis Fungemia in Neonatal Intensive Care Unit Patients: There's a [New] Fungus Among Us!
Huan Justina Chang

1997 Epidemic of Deaths from Acute Renal Failure Among Children in Haiti.
Katherine L. O'Brien

1998 And Weighing in at 25 Million Pounds—A Multistate Outbreak of Escherichia coli 0157:H7 Infections and the Largest Ground Beef Recall in United States History.
Kate Glynn

1999 Clinical Mismanagement of Community Outbreak? The Contribution of DNA Finger-Printing to the Analysis of Chronic, Drug-Resistant Tuberculosis in Buenaventura, Colombia, 1998.
Kayla F. Laserson

2000 Serratia liquefaciens Bloodstream Infections and Pyrogenic Reactions Associated with Extrinsically Contaminated Erythropoietin—Colorado.
Lisa Grohskoph

2001 When Beauty Is More Than Skin Deep: An Outbreak of Rapidly Growing Mycobacterial Furunculosis Associated with a Nail Salon—California, 2000.
Kevin L. Winthrop

2002 Dances with Cows? A Large Outbreak of E. coli O157 Infections at Multi-Use Community Facility—Lorain County, Ohio, September 2001.
Jay K. Varma

2003 Hepatitis C Virus Transmission from an Antibody-Negative Organ and Tissue Donor.
Barna D. Tugwell

2004 Multiple Hepatitis A Outbreaks Associated with Green Onions Among Restaurant Patrons—Tennessee, Georgia, and North Carolina, 2003
Joseph J. Amon

2005 Case-Control Study of an Acute Aflatoxicosis Outbreak.
E. Azziz-Baumgatner

2006 Delayed Onset of Pseudomonas fluorescens Group Bloodstream Infections After Exposure to Contaminated Heparin Flush—Michigan and South Dakota.
Mark Gershman

2007 Epidemiologic and Molecular Investigation of an Outbreak of Hepatitis C Viral Infection at Hemodialysis Unit—Richmond Virginia, 2006.
Nicola Thompson

2008 Multistate Measles Outbreak Associated with an International Youth Sporting Event—Pennsylvania, Michigan, and Texas, August–September 2007.
Tai-Ho Chen

2009 Cardiac Events and Deaths in a Dialysis Facility Associated with Healthcare Provider—Texas, 2008.
Melissa K. Schaefer

2010 Fatal Case of Laboratory-Acquired Infection with an Attenuated Yersinia pestis Strain of Plague—Illinois, 2009.
Andrew Medina-Marino

2011 Outbreak of Nosocomial Listeriosis—Texas, 2010.
Noha H. Farag

2012 Pyrrolizidine Alkaloid Toxicity as the Cause of Unknown Liver Disease—Tigray, Ethiopia, 2007–2011.
Danielle E. Buttke

2013 Active Surveillance for Variant Influenza Among Swine, the Environment, and Employees at Live Animal Markets—Minnesota, 2012.
Mary J. Choi

2014 Two Cattle Herdsmen Infected With a Novel Species of Orthopoxvirus—Georgia (county), 2013.
Neil Vora

2015 Molecular Epidemiology of Mycoplasma Pneumoniae (Mp) During an Outbreak of Mp-Associated Stevens-Johnson Syndrome.
Louise Francois Watkins

2016 Legionnaires' Disease Caused by a Cooling Tower — New York City, 2015.
Isaac Benowitz

2017 Unusual Pathogen Associated with Nonbiting Flies in a Person with Bacteremia — Washington State, 2016.
Jesse Bonwitt

2018 Use of a New Serologic Approach to Identify Avian Influenza A(H7N2) Virus Infections Among Animal Shelter Employees and Volunteers — New York City, 2016–2017.
Eugenie Poirot

2019 Coagulopathy Caused by Brodifacoum Rodenticide Poisoning Among Persons Who Smoke Synthetic Cannabinoids — Wisconsin, 2018. Erica Wilson
Erica Wilson

2020 No Award

2021 No Award

2022 Lauren Jansen, EIS 2021 and Julia Petras, EIS 2021

2023 Leveraging Wastewater Surveillance to Understand Silent Spread of Poliovirus in New York State, 2022.
Nina Masters

Outstanding Poster Presentation Awards, 1986–2019

1986 Gender Gap in the Diaper Set: A Closer Look at Differences in Sex-Specific Mortality.
Ray Yip

1987 Socioeconomic Differences in Smoking Behavior in Selected States.
Thomas E. Novotny

1988 Late-Stage Diagnosis of Breast Cancer Among Women in Low Socioeconomic Groups, Connecticut, 1984–1985.
Thomas A. Farley

1989 Malaria Infection in Early Infancy, Malawi.
Laurence Slutsker

1990 Seroprevalence of Human Immunodeficiency Virus Type I Among College Students, United States.
Brian R. Edlin

1991 Diarrheal Outbreak Associated with a Cyanobacteria (Blue-Green Algae)-Like Body, Chicago.
Philip P. Huang

1992 Response to One Dose of Inactivated Poliovirus Vaccine after Three Doses of Oral Poliovirus Vaccine, Abidjan, Côte d'Ivoire.
Bernard J. Moriniere

1993 Cholera Outbreak in Rumonge, Burundi.
Maureen E. Birmingham

1994 Salivary Testing as an Epidemiologic Tool During an Outbreak of Hepatitis A in an Amish Community in Indiana.
Edmundo Muniz

1995 Longitudinal Predictors of Initiation of Smokeless Tobacco Use.
Scott L. Tomar

1996 Nonvenomous Animal-Related Fatalities in the U.S. Workplace, 1992–1994.
Constance C. Austin

1997 Multidrug-Resistant Pneumococcal Meningitis in a Day Care Center—Tennessee.
Allen Craig

1998 Beliefs About the Tobacco Industry and Opinions About Anti-Tobacco Policies: How Tight is the Link?
Arthur E. Chin

1999 Cold Breakfast Cereal: A New Vehicle Implicated in a Multistate Outbreak of Salmonella Agona Infections.
Thomas Breuer

2000 Hurricane—Puerto Rico, 1998.
Dan O'Leary

2001 Counting Crows: Crow Mortality as a Sentinel for West Nile Virus Disease in Humans—Northeastern United States, 2000.
Kathleen G. Julian

2002 Outbreak of Echovirus 18 Meningitis at a Summer Camp—Alaska, 2001.
Joseph B. Mclaughlin

2003 Surveillance for Chlamydia in Women—South Carolina, 1998–2001.
Wayne A. Duffus

2004 Hospitalizations Associated with Rotavirus Diarrhea—United States, 1996–2000.
Myrna Charles

2005 Risk of Secondary Transmission from Imported Lassa Fever—New Jersey, 2004.
Ester Tan

2006 Risk Factors for Helicobacter pylori in a Rural Community—Montana, 2005.
Elizabeth Melius

2007 Outbreak of Escherichia coli 0157 Associated with Packaged Spinach—Wisconsin, 2006.
Authur M. Wendel

2008 The Power of Combining Routine Molecular Subtyping and Specific Food Exposure Interviews During Escherichia coli O157:H7 Outbreak—Minnesota, 2007.
Stacy M. Holzbauer

2009 Seroprevalence of Herpes Simplex 2—National Health and Nutritional Examination Surveys, United States, 2005–2006.
Sara E. Forhan

2010 Travelers' Impressions of 2009 H1N1 Influenza National Health Messaging Campaign.
Emily Jentes

2011 Vibrio mimicus Infection After Consumption of Crayfish—Spokane, Washington, 2010.
Meagan K. Kay

2012 Associations Between Salmonella Serotypes and Particular Food Commodities—United States, 1998–2008.
Brendan R. Jackson

2013 A Spicy Catch: Salmonella Bareilly and Nchanga Infections Associated with Raw Scraped Tuna Product—United States, 2012.
W. Thane Hancock

2014 Two Fish, One Fish: Decreasing Number of Outbreaks Attributed to Fish—United States, 1998–2011.
Jolene Nakao

2015 Ebola Infection in a Maternity Ward—Tonkolili, Sierra Leone, 2014.
Angela Dunn

2016 Increased Cases of Syphilis Among Pregnant Women and Infants—United States, 2012–2014
Charnetta Williams

2017 Seoul Searching: Outbreak of Seoul Virus among Ratteries and Pet Owners — Illinois, 2017.
Janna Kerins

2018 Multiple Reports of Gastrointestinal Illness at a Hotel and Convention Center — Connecticut, 2017.
Vivian Leung

2019 Coccidioidomycosis in U.S. residents returning from house-building trips in Baja California, Mexico, June-July, 2018.
Mitsuru Toda

2020 (Discontinued Award)

Paul C. Schnitker International Health Awards, 1995–2023

1995 Leslie F. Roberts
1996 Peter Kilmarx
1997 Alexander K. Rowe and Eric L. Mouzin
1998 Etienne G. Krug
1999 Kayla F. Laserson
2000 John MacArthur and Peter Salama
2001 Valerie D. Garrett
2002 Robert D. Newman and Lorna E. Thorpe
2003 Puneet Dewan, Lisa Nelson, and Pratima Raghunathan
2004 Tracy Creek
2005 Oleg Bilukha
2006 Kevin Cain
2007 Avid Reza
2008 Sapna Bamrah and David Lowrance
2009 Rinn Song
2010 Andrew Auld
2011 W. Roodly Archer
2012 Sudhir Bunga and Janell A. Routh
2013 Kevin R. Clarke
2014 Eugene Lam and Miriam Shiferaw
2015 Edna Moturi and Raina Phillips
2016 José E. Hagan
2017 Lawrence Purpura
2017 J. Lyle Conrad *Official Paul C. Schnitker Committee Historian Award*
2018 Rebecca Casey
2019 Scott Nabity and Elizabeth Swedo
2020 Nirma Bustamante
2021 Rachael Zacks
2022 Katrin Sadigh
2023 Parsa Bastani
2023 Audrey Rachlin

James H. Steele Veterinary Public Health Awards, 1999–2023

1999 Fred Angulo and Jordan Tappero
2000 David Ashford
2001 Kate Glynn
2002 Kirk Smith
2003 Mike Bunning
2004 Jennifer McQuiston
2005 John Crump
2006 Katherine Feldman and James Kile
2007 Jennifer Wright
2008 John Dunn
2009 Casey Barton Behravesh and Stacy Holzbauer
2010 Kendra Stauffer
2011 Jennifer Adjemian and Adam Langer
2012 Barbara Knust
2013 Maho Imanishi and Megin Nichols
2014 Danielle Buttke
2015 Ryan Wallace
2016 Colin Basler and Neil Vora
2017 Ilana Schafer
2018 Laura Adams and Thomas Doker
2019 Caitlin Cossaboom
2020 Radhika Gharpure
2021 Jesse Bonwitt
2022 Kate Varela
2023 Betsy Schroeder

Mitch Singal Excellence in Occupational and Environmental Health Awards, 2010–2023

2010 Surveillance and Prevention of Occupational Injury Deaths—Wyoming, 2003–2007.
Paul Anderson

2011 Unprecedented Outbreak of Acute Childhood Lead Poisoning—Zamfara State, Nigeria, 2010.
Carrie A. Dooyema

2012 Pyrrolizidine Alkaloid Toxicity as the Cause of Unknown Liver Disease— Tigray, Ethiopia (2007–2011).
Danielle E. Buttke

2013 Impact of Aerial Insecticide Spraying on West Nile Virus Disease—North Texas, 2012.
Duke J. Ruktanonchai

2014 Workplace Secondhand Smoke Exposure Among Nonsmoking Women of Reproductive Age—United States, 2010.
Candice Johnson

2015 Parking Prices and Walking and Bicycling to Work in U.S. Cities.
Geoffrey Whitfield

2016 Cleanliness is Next to Breathlessness: Asthma and Other Health Problems Related to a New Cleaning Product Among Hospital Staff—Pennsylvania, 2015
Megan Casey

2017 Occupational and Take-Home Lead Exposure Associated with a Lead Oxide Manufacturing Plant—North Carolina, 2016.
Jessica L. Rinsky

2018 Occupational Exposure to Carbon Disulfide in an Artificial Casing Manufacturing Plant — United States, 2017.
Reed Grimes

2019 Use of an Environmental Burden Index for Health Outcome Research — United States, 2018.
Amy Lavery

2020 No Award

2021 No Award

2022 Elevated Respirable Crystalline Silica Exposure Among Engineered Stone Fabrication Workers — California, January 2019–February 2020
Krishna Surasi

2023 Elevated Spot Urine Thallium Levels Within a Family Associated with Kale Chip Consumption — Central California, August 2022
Asha Choudhury

Stephen B. Thacker Excellence in Mentoring Awards, 2013–2023

2013 Stephen B. Thacker
2014 Lyle Conrad
2015 Douglas H. Hamilton
2016 Polly Marchbanks
2017 Jennifer McQuiston
2018 James Mercy and William Schaffner
2019 Brenda Rivera-García
2020 Kristine (Kris) Bisgard
2021 John Kobayashi
2022 Matt Cartter
2023 Kirk Smith

Shalon M. Irving Health Equity Award 2018–2023

2018 Francis Annor
2019 Sharoda Dasgupta
2020 Lisa Oakley
2021 Miriam Van Dyke
2022 Michele Bolduc
2023 Amy Board

2023 EIS Conference Abstracts

TUESDAY, APRIL 23, 2024

SESSION A: Stephen B. Thacker Opening

9:00—10:45 am

Moderators: Les Dauphin & Deb Houry

9:05 *Stenotrophomonas maltophilia* Bloodstream Infection Outbreak in an Acute Care Hospital —Alameda County, California 2022–2023

Authors: Sana M. Khan, A.A. Vazquez Deida, S. Langerman, J. Hunter, A.L. Halpin, A. Kent, P. Gable, F. Knight, A. Chitnis, E.F. Dunne, K. Perkins, D. Heaton, M. Shemsu, E. Villarino, J. Silvers, K.K. Trivedi

Background: *Stenotrophomonas maltophilia* is an opportunistic pathogen found in healthcare settings. During April–September 2022, nine S. *maltophilia* bloodstream infections (BSIs) were identified among intensive care unit (ICU) patients at a hospital in Alameda County, California. Whole genome sequencing found isolates to be highly related. Despite implementation of infection prevention and control (IPC) interventions, four additional S. *maltophilia* BSIs were identified during June–September 2023. We investigated to identify risk factors for infection and stop transmission.

Methods: We conducted a matched case-control study. A case was defined as S. *maltophilia* isolated from a blood culture from an ICU patient with a fever during April 2022–September 2023; control-patient subjects were patients admitted to the ICU during the same period with hospital stay greater than or equal to their matched case. Three control subjects were matched to each case. We extracted information on risk factors for infection from medical charts and observed IPC practices in hospital locations of interest. We collected environmental samples from the ICU, radiology unit, and emergency department.

Results: Among 13 cases and 39 control subjects, patients exposed to iodinated contrast Omnipaque-300 (odds ratio [OR]: 5.7; 95% CI: 1.2–28.0), injectable propofol (OR: 12.2; 95% CI: 1.5–101.4), or fentanyl (OR: 9.2; 95% CI: 1.8–Inf.) were more likely to have a S. *maltophilia* BSI, compared with control subjects. IPC deficiencies included improper cleaning and storage of medical equipment, including the contrast injection system and patient care supplies. The outbreak strain of S. *maltophilia* was not isolated from environmental samples.

Conclusions: Although a point source was not identified, S. *maltophilia* was likely transmitted through improper IPC practices involving injectable contrast or anesthesia. Recommendations on proper cleaning and disinfection of the contrast injection system and proper storage, preparation, and administration of medications were made to reduce risk for contamination.

9:25 Underlying Medical Conditions and Rate of Influenza-Associated Hospitalization Among Adults — VISION-Flu Network, 2016–2017 to 2019–2020

Authors: Aaron M. Frutos, M.W. Tenforde, D. Sundaresan, A.L. Naleway, S.A. Irving, M.B. DeSilva, A.B. Kharbanda, T.C. Ong, S. Rao, K. Zheng, S.K. Gohil, S.W. Ball, R.V. Fink, C. Reed, S. Garg, C.H. Bozio

Background: Certain underlying medical conditions (UMCs) elevate the risk of influenza-associated hospitalization. However, the impact of multiple concurrent UMCs on this risk is not well understood. We evaluated the differences in influenza-associated hospitalization rates by UMC and the number of coexisting UMCs.

Methods: In a retrospective cohort analysis of data from two health systems during four influenza seasons (2016–2017 to 2019–2020), we estimated influenza-associated hospitalization rates by UMC type (blood disorders, cerebrovascular disease, asthma, chronic obstructive pulmonary disease (COPD), chronic heart failure (CHF), ischemic heart disease, liver disease, diabetes, neurologic disorder, chronic kidney disease, and rheumatologic or autoimmune conditions) and number of UMCs (0, 1, 2, 3, or ≥4 types). Inclusion criteria required adults to be current members of the health system and with at least 1 ambulatory visit in the 12 months preceding the given influenza season. Participants were censored after their first influenza-associated hospitalization within each season. We calculated adjusted rate ratios (aRR) comparing those with versus without UMCs and number of UMCs versus no UMCs using Poisson regression adjusted for age, sex, race, ethnicity, site, season, and social vulnerability index quartile.

Results: Among 2,131,755 cohort members (median age 51 [IQR 36–64] and 79% non-Hispanic white), there were 1,403 influenza-associated hospitalizations. The aRR for influenza-associated hospitalization was higher across all UMC categories and highest for individuals with CHF (4.3, 95% CI: 3.8–5.0) and COPD (4.1, 95% CI: 3.6–4.6). The aRR of influenza-associated hospitalization increased with each additional UMC: 1 (2.7, 95% CI: 2.2–3.4); 2 (6.0, 95% CI: 4.8–7.5); 3 (13.1, 95% CI: 10.5–16.5); ≥4 (23.9, 95% CI: 19.0–29.9).

Conclusions: Cardiopulmonary conditions and number of UMCs were most strongly associated with increased influenza-associated hospitalization rates. These findings have important implications for communicating benefits of influenza vaccination and early influenza antiviral treatment.

9:45 Syndromic Surveillance for Case Detection in a Varicella Outbreak Among Recent Immigrants in New York City — 2023

Authors: Melanie S. Askari, R. Arciuolo, O. Matalka, K. Graham, B. Isaac, R. Lall, A. Jean, J. Rosen

Background: Since October 2022, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) has been investigating a large varicella outbreak among recent immigrants to NYC. In March 2023, DOHMH started using emergency department (ED) syndromic surveillance to enhance case finding. We assessed syndromic surveillance performance for improving varicella case detection and response during an outbreak in NYC.

Methods: DOHMH received varicella reports from routine sources (clinicians, laboratories, shelters, schools, and childcare facilities) and syndromic surveillance. Syndromic surveillance reports included ED visits with a varicella chief complaint or discharge diagnosis during March–August 2023. Reports were classified as cases based on CSTE's case definition; outbreak-associated cases were in persons who arrived in NYC since June 2022 or had an epidemiological link to another outbreak-associated case. Syndromic surveillance positive predictive value (PPV) and percent of outbreak-associated cases were calculated. We determined timeliness (average time from rash onset to DOHMH report) for outbreak-associated cases from syndromic and routine reports.

Results: DOHMH received varicella reports for 639 individuals: 283 from syndromic surveillance, 281 from routine sources, and 75 from both sources. We identified 513 varicella cases: 247 (48.1%) from syndromic surveillance alone, 194 (37.8%) from routine sources alone, and 72 (14.0%) from both sources. Among 358 syndromic surveillance reports, 319 were cases (PPV = 89.1%). Overall, we identified 310 outbreak-associated cases, 139 through syndromic surveillance (44.8%); syndromic surveillance was the only reporting source for 75 (24.2%) outbreak-associated cases. Outbreak-associated varicella cases reported from syndromic surveillance were timelier vs routine reporting sources (4 days [range: 1–27] vs 9 days [range: 0–52]).

Conclusions: DOHMH syndromic surveillance improved case ascertainment, demonstrating utility in varicella surveillance, particularly in outbreak settings. Syndromic surveillance allowed for earlier outbreak case detection, which can facilitate timelier control measures, including administering vaccines and implementing congregate setting isolation protocols.

10:05 Trends in Prescription Medication, Polypharmacy, and Potentially Inappropriate Medication Use Among Adults Aged 65 and Older — United States, 1999–2020

Authors: Gabriel K. Innes, C.L. Ogden, V. Crentsil, J. Concato, T.H. Fakhouri

Background: An aging United States population with increasingly common chronic conditions have led to growing reliance on prescription medications. Although medications are crucial for combating illness, use of multiple medications and inappropriate prescribing can cause severe adverse drug reactions and lead to hospitalizations and death, especially in older populations. We assessed trends in prevalence of polypharmacy (≥5 medications used) and use of potentially inappropriate medications (PIMs) among US adults ≥65 years to identify opportunities for interventions. Others have explored the prevalence of prescription medication and PIM use previously; however, it is unknown how these have changed over time.

Methods: Reported use of prescription medications within the past 30 days was collected from 19,419 adults ≥65 years in the National Health and Nutrition Examination Survey during 1999–2020, encompassing 10 survey cycles. Trends in polypharmacy and PIM use were assessed via linear and joinpoint regression. American Geriatric Society's 2023 updated Beers Criteria was used to classify PIMs that risk adverse drug reactions in older adults. Analyses accounted for NHANES' complex survey design.

Results: In the most recent NHANES cycle, 2017–2020, 90.0% (95% CI: 88.1%–91.6%) of older adults reported any prescription medication use, 43.0% (95% CI: 39.6%–46.6%) reported polypharmacy, and 44.6% (95% CI: 41.2%–48.1%) used ≥1 PIMs. Polypharmacy increased on average 3.2 percentage points annually during 1999–2004 (P = 0.01) and 0.4 percentage points thereafter (P = 0.04). PIM use, on average, decreased 0.3 percentage points annually during 1999–2020 (P = 0.01).

Conclusions: During 1999–2020, polypharmacy increased among older US adults, while PIM use was relatively stable. With 4-in-10 older US adults using ≥5 prescription medications from 2017 to 2020, healthcare professionals should remain vigilant to the rising polypharmacy trend and optimize prescribing practices to minimize potential adverse drug reactions.

10:25 Willingness to Use HIV Pre-Exposure Prophylaxis Among HIV-Serodifferent Couples in Seven African Countries — 2019–2022

Authors: J. Danielle Sharpe, R. Laws, C. West, G. Djomand, J. Omolo, D. Ramaabya, M. Li, S. Dlamini, M. Motebang, V. Singano, C. McCabe, J. Seleme, N. Kancheya, R. Malaba, G. Ncube, N. Philip, S. Biraro, M. Charurat, A. Voetsch

Background: HIV-serodifferent couples represent an estimated one-third of new HIV infections in sub-Saharan Africa (SSA). HIV pre-exposure prophylaxis (PrEP) is effective for preventing HIV infection, but rollout has lagged across SSA. We assessed determinants of PrEP willingness among HIV-serodifferent couples to guide PrEP interventions.

Methods: We analyzed cross-sectional data from 1,738 persons without HIV aged ≥15 years in HIV-serodifferent couples who participated in HIV-focused household surveys in Botswana, Eswatini, Lesotho, Malawi, Mozambique, Zambia, and Zimbabwe during 2019–2022. Interviewer-administered questionnaires, home-based HIV rapid testing, and HIV viral load testing were conducted. We defined PrEP need as being unaware of a partner's HIV-positive status or having a virally unsuppressed partner (≥200 copies/mL); no PrEP need was defined as both being aware of a partner's HIV-positive status and having a suppressed partner (<200 copies/mL). We used survey weights and jackknife variance estimation to conduct multivariable logistic regression and calculate adjusted odds ratios (aOR) to assess PrEP willingness

Results: Overall, 69.1% of persons without HIV in HIV-serodifferent couples were willing to use PrEP. Persons without PrEP need had higher odds of PrEP willingness than those with PrEP need (76.4% vs 68.0%; aOR: 1.76; 95% CI: 1.12–2.77). Those who were previously aware of PrEP had higher odds of PrEP willingness than those who learned about PrEP during the survey (83.2% vs 66.0%; aOR: 2.29; 95% CI: 1.28–4.10).

Conclusions: Persons in HIV-serodifferent couples at lower HIV risk were more willing to use PrEP than those at increased risk for HIV. PrEP willingness was higher among persons in HIV-serodifferent couples who were previously aware of PrEP; however, two-thirds who learned of PrEP during the survey became PrEP-willing. These results highlight the need to increase PrEP awareness during couples HIV testing and counseling to improve PrEP willingness among HIV-serodifferent couples disproportionately affected by HIV.

CONCURRENT SESSION B1: Climate and Health

11:15 am–12:40 pm

Moderators: Tony Nguyen & Ari Bernstein

11:20 When Temperatures Rise: Assessing the Association Between Daily Maximum Temperature and Nonfatal Assault Hospitalizations in New York City, 2016–2021

Authors: Yoon-Sung Nam, M. Hamed, A. Spira-Cohen, K. Ito, C. Olson

Background: Research shows hot temperatures can lead to heightened aggression, raising concerns about worsening violence with climate change. New York City's projected temperature increase of 4°–6°F by the 2050s highlights the importance of better understanding the health effects from climate change. We sought to quantify the association between elevated maximum daily temperatures and risk for nonfatal assaults in New York City (NYC).

Methods: We used ICD-10 codes (X92-Y09) from the Statewide Planning and Research Cooperative System to analyze hospitalization visits for assault-related injuries that occurred during the warm months (May–September) during 2016–2021. We applied distributed lag nonlinear negative binomial models with 1–4-day lag and natural spline, accounting for within-season trends. Directed Acyclic Graphs guided variable selection. We estimated cumulative and attributable risk, controlling for federal holidays, COVID-19 lockdown, precipitation, school days, and days of the week. Stratified analysis compared neighborhood-level heat risk across social and environmental factors (eg, green space, air conditioning, race, income).

Results: Our analysis of 126,304 nonfatal assault hospitalizations found that risk for nonfatal assault hospitalizations increased with temperature, peaking at 88°F (75th percentile). The cumulative relative risk ratio was 1.23 (95% CI: 1.14–1.32) with 2-day lag. At 83°F (50th percentile), 10.2% (95% CI: 7.1%–13.2%) of nonfatal assault hospitalizations were attributable to increased temperature, corresponding to 1,156 (95% CI: 823–1,498) excess assaults per year. Residents in low-income neighborhoods with limited access to air conditioners and green space had a higher cumulative relative risk of 1.26 (95% CI: 1.16–1.37) compared to those with greater access.

Conclusions: Higher temperatures were associated with an increased risk of nonfatal assault hospitalizations, although the direct and indirect pathways remain unclear. Our findings align with research suggesting the potential of climate change to affect health, including violence, indicating that violence prevention policies should address heat vulnerabilities.

11:40 Rapid Needs Assessment of Households Affected by Flash Flooding — Riverside County, California, September 2023

Authors: Bethan G. Swift, K. Meconis, H. Jin, M. Plumley, W. Hetherington, J. Chevinsky, M. Penny

Background: On September 3, 2023, flash flooding caused a portion of a berm built around a trash-burning area to fail, allowing water to inundate a mobile home park. The trash burning area is located on tribal land and has been the subject of environmental justice concerns, including identification of soil contamination with dioxins in 2003. Riverside County Department of Public Health surveyed affected households to assess changes in their health and community environment, and their perceived needs after the flooding incident.

Methods: On September 5 and September 10, door-to-door household-level surveys were conducted. We adapted a hurricane Community Assessment for Public Health Emergency Response (CASPER) questionnaire. On September 5, Riverside County Department of Environmental Health collected 4 flood water samples from the area for environmental testing of dioxins and furans, volatile organic compounds, heavy metals, and polycyclic aromatic hydrocarbons.

Results: Twenty-two (60%) of 37 households completed the survey. Ten households (46%) reported skin contact with water, mud, or debris after the flood, and 7 (32%) reported that their health had been affected by the recent flood. Four (57%) of the 7 households reported upper respiratory symptoms, including coughing, eye irritation, or sore throats, but only 2 (29%) of those with reported health changes sought medical care. Increased mosquito activity was reported by 73% of households, and 23% requested help with reducing mosquitoes or standing water on their premises. Though some metals were detected in the flood water samples, all appeared to be below hazardous waste levels.

Conclusions: The community identified vector control as a priority after the floods and highlighted opportunities for more proactive partnerships with Environmental Health to address vector-borne illness for seasons with more predicted rain and flooding. Working with this community and understanding their needs should be a priority as we begin our climate justice work.

12:00 Emergency Department Visits for Acute Myocardial Infarction During the Canadian Wildfires — United States, April 30–August 4, 2023

Authors: Essi M. Havor, R. Woodruff, O. Imoisili, F. Coronado, L. Schieb, S. Jackson, A. Gates, L. Radhakrishnan, A. Thompson-Paul

Background: Recent Canadian wildfires led to dangerous air quality in parts of the United States (US). Wildfire smoke exposure can increase the risk of cardiovascular diseases (CVD). We examined data from the National Syndromic Surveillance Program (NSSP) to detect changes in emergency department visits for acute myocardial infarction (ED-AMI) during wildfire events.

Methods: Using NSSP's Electronic Surveillance System for the Early Notification of Community-Based Epidemics and AirNow data, we examined ED-AMI among US adults aged ≥18 years during the Canadian wildfires (April 30–August 4, 2023). We defined ED-AMI by using *International Classification of Diseases, 10th Revision, Clinical Modification* code I21. Air Quality Index (AQI) data were reported as 24-hour particulate matter (PM2.5) concentrations. We examined differences in ED-AMI by age, sex, and US Health and Human Services (HHS) regions bordering Canada in the Northeast (1–3), Midwest (5, 8), and West (10). We calculated excess ED-AMI (i.e., differences in mean daily ED-AMI between the 2023 Canadian wildfires, the same timeframe in 2022, and 3 months before the wildfires).

Results: Of 86,281 ED-AMI during the Canadian wildfires, 54% were among adults aged 50–64 years and 60% among males. HHS regions 2, 3, and 5 reported 19, 11, and 15 excess ED-AMI per day, respectively, compared to the same period in 2022. Only Region 2 showed excess ED-AMI (7 per day) compared to 3 months before the Canadian wildfires. In Region 3, significant increases ($P < 0.01$) in daily ED-AMI occurred on 2 consecutive days (191 on June 7 and 166 on June 8), coinciding with very unhealthy air quality (AQI ≥201).

Conclusions: HHS Regions 2, 3, and 5 experienced excess ED-AMI during the Canadian wildfires. During future wildfires, NSSP can be leveraged to provide real-time ED-AMI data to guide preparedness and public health messaging for vulnerable populations.

12:20 Using Syndromic Surveillance for Heat-Related Illness in North Carolina (2009–2023) to Evaluate Local Interventions

Authors: Camden D. Gowler, A. Locklear, S.M. Hatcher, A. Fleischauer

Background: Heat-related illness (HRI) is preventable but can result in confusion, dizziness, seizures, or even death. Climate change might exacerbate HRI incidence because of increasing environmental temperatures. North Carolina averages ~4,000 HRI emergency department (ED) visits yearly, and the Sandhills region has among the highest per capita rates. In 2018, the North Carolina Department of Health and Human Services (NCDHHS) began sending heat-health alerts in certain Sandhills communities when the heat index surpassed 37.7°C (100°F). We used syndromic surveillance to evaluate long-term trends of HRI in North Carolina and effects of the Sandhills heat alert intervention.

Methods: All civilian hospitals report ED data to NCDHHS. We used the previously validated syndromic definition to analyze HRI ED visits during 2009–2023 and used census data to estimate heat-season (May–September) HRI incidence rates. First, we used generalized linear models (GLM) to analyze HRI incidence rates statewide over time. Next, we evaluated heat alerts with a GLM by estimating HRI incidence in communities as a function of heat index and time before or after the intervention.

Results: During the 15-year period, 61,377 unique ED visits for HRI in North Carolina were reported. Heat-season HRI incidence rates showed no overall temporal trend ($P = 0.73$); however, higher environmental temperature was associated with more HRI ($F1,12 = 15.6$; $P = .002$). HRI incidence was lower overall in the Sandhills postintervention (time since intervention, $P = 0.02$), but incidence increased after 2021. A counterfactual linear model predicted a higher incidence of HRI in the Sandhills postintervention period if the alerts did not occur (49 visits/100,000 averted over 5 years).

Conclusions: Accounting for temperature fluctuations, HRI incidence in North Carolina remained stable during 2009–2023. The reduction in HRI incidence in the Sandhills region postintervention suggests heat alerts can be useful for prevention.

CONCURRENT SESSION B2: Complex Healthcare-Associated Investigations

11:15 am–12:40 pm

Moderators: Ermias Belay & Mike Bell

11:20 Tuberculosis Infection and Disease After Surgical Implantation of Contaminated Bone Tissue Allografts — Nine U.S. States, 2023

Authors: Paula M. Williams, K. Schildknecht, N. Schwartz, S. Althomsons, K. Raz, C. McDaniel, C. Schember, I. Griffin, E. McDonald, P. Annambhotla, S. Basavaraju, A. Starks, M. Haddad, J. Wortham, R. Stewart

Background: In 2021, implantation of bone allograft product containing *Mycobacterium tuberculosis* resulted in 87 (77%) of 113 surgical recipients developing spinal or disseminated tuberculosis. In 2023, a second multistate bone allograft-related tuberculosis outbreak was identified after two clinicians independently reported tuberculosis cases, noting similarities to the previous outbreak. We investigated to identify evidence of tuberculosis infection and disease among recipients, implement timely treatment, and develop prevention strategies.

Methods: Following notification on July 12, 2023, of a potential contaminated product lot used in surgeries, 53 units were withheld from distribution. Health departments and healthcare facilities identified recipients of 49 units already implanted and reported clinical findings through a standardized case report form. We identified evidence of *M. tuberculosis* infection through positive interferon-gamma release assays (IGRAs) and tuberculosis disease through laboratory or clinical findings consistent with tuberculosis.

Results: Thirty-six persons in nine states received ≥1 unit during February 28–June 22, 2023. Two recipients died of tuberculosis on postoperative days 70 and 113. The 34 remaining recipients began treatment on postoperative days 25–181. As of November 9, 2023, 33 of 34 living recipients had been tested with an IGRA; 26 (79%) had positive results for tuberculosis infection. Five (14%) recipients developed laboratory-confirmed tuberculosis disease, including four with positive *M. tuberculosis* cultures. Five (14%) additional recipients had radiologic findings compatible with tuberculosis disease; another seven (19%) had nonspecific symptoms that were compatible with tuberculosis.

Conclusions: Three-fourths of recipients developed tuberculosis infection or disease after implantation of contaminated bone allograft product, and two died shortly after the outbreak was identified. Prompt outbreak detection facilitated public health interventions to reduce morbidity through product recall and early treatment initiation. Routine monitoring of patient outcomes after bone allograft product implantation is needed to identify adverse events, raise awareness, and facilitate future early outbreak detection.

11:40 Transmission of *Ehrlichia chaffeensis* Infection from an Organ Donor to a Transplant Recipient — Wisconsin, United States, October 2023

Authors: Ann Carpenter, M.L. Taylor, D.W. McCormick, S.V. Basavaraju, P. Annambhotla, E. Schiffman, R. Osborn, J.A. Villalba, D. Kuehler, C. Thiessen, A. Doyle, J. Odorico, C.D. Paddock, J.S. Salzer

Background: *Ehrlichia chaffeensis* is a tickborne rickettsial pathogen that causes ehrlichiosis, a disease that can be severe in people who are immunocompromised. Transmission via blood transfusion or solid organ transplantation has been rarely described and screening for rickettsial pathogens among blood or organ donors is not routinely performed. After identifying *E. chaffeensis* in a Wisconsin patient who received a kidney from a living donor from Minnesota, we investigated to understand the source of infection.

Methods: The following clinical specimens were obtained: serum from donor and recipient (collected 10–13 days before organ transplantation and on day of transplantation); whole blood, renal allograft biopsy, and perinephric fluid from the recipient collected 11–16 days post-transplantation; and donor serum collected 119 days post-transplantation. Serologic testing was performed; seroconversion was defined as a 4-fold rise in titer. Renal allograph tissue was tested using *Ehrlichia* species-specific immunohistochemistry; serum, perinephric fluid, and whole blood were tested for *Ehrlichia* species using PCR. Donor and recipient interviews were conducted to understand tick exposure and travel history.

Results: *E. chaffeensis* nucleic acid was not detected in pre-transplant or day-of-transplant serum. Donor serology demonstrated *E. chaffeensis* seroconversion (1:128 pre-transplant; 1:512 post-transplant). *E. chaffeensis* was detected in recipient perinephric fluid, renal allograph tissue, and whole blood. The donor recalled a tick bite on a hunting trip to Kansas 18 days prior to organ procurement and symptoms attributed to stomach flu shortly after the trip, prior to organ procurement. The recipient was treated successfully with doxycycline.

Conclusions: Transmission of *E. chaffeensis* through organ transplantation is rare but should be considered among donors who live or recreate in areas where the tick vector exists. Donor history risk assessment questionnaires should include questions related to tick bite exposures or recent travel history to guide laboratory testing and recipient clinical management.

12:00 Lymphocytic Choriomeningitis Virus Infection in Two Solid Organ Transplant Recipients — United States, 2023

Authors: Kami L. Smith, L. Sayyad, H.R. Vikram, C.M. Cossaboom, M.J. Choi, K. Sadigh, M. Brady, D. Cannon, I. Krapiunaya, M. Morales-Betoulle, S. Whitmer, B.A. Aqel, B.W. Hardaway, H.A. Khamash, C.C. Jadlowiec, T.E. Grys, C.Y. Chiu, S.V. Basavaraju, P. Annambhotla, I. Ruberto, G. Adame, M. Kretschmer, N. Gutierrez, K. Zabel, C. Fritz, C. Austin, T. Shoemaker, J. Klena, J. Montgomery

Background: Lymphocytic choriomeningitis virus (LCMV) is a rodent-borne arenavirus that typically causes asymptomatic or mild influenza-like illness but, in some cases, results in meningitis and encephalitis. In immunosuppressed individuals such as transplant recipients, LCMV can cause severe neurological complications and death. Donor-derived LCMV infections in solid organ transplant recipients have been previously described. Between April–June 2023, LCMV infections were detected by clinical metagenomic next-generation sequencing (mNGS) in two organ transplant recipients from separate donors; one of these individuals died. Multistate laboratory and epidemiologic investigations of the donors and their respective recipients were initiated to determine the source and extent of LCMV infections..

Methods: Following identification of LCMV in the two transplant recipients, CDC worked with the transplant facilities and state and local jurisdictions in Arizona, California, and Illinois to identify transmission route. Investigation included obtaining available specimens and clinical and epidemiologic information from the two donors and all transplant recipients. CDC Viral Special Pathogens Branch diagnostic laboratory performed confirmatory molecular and serological testing and mNGS on all available samples.

Results: CDC laboratory testing confirmed LCMV infection in the two organ recipients with presumptive positive LCMV results by mNGS; epidemiologic investigations revealed that both had significant uncorrelated rodent exposure histories. No laboratory evidence of LCMV infection was observed in either donor or in other recipients of organs from these donors.

Conclusions: Findings from these multistate collaborative laboratory and epidemiologic investigations suggest that both LCMV infections likely resulted from rodent exposure leading up to transplantation rather than from donor-derived transmission. Immunosuppression following transplantation likely resulted in progressive and disseminated LCMV infection. These results emphasize the need for increased awareness regarding LCMV transmission risks amongst clinicians and transplant recipients. Rodent exposure should be avoided in immunocompromised hosts.

12:20 Cluster Investigation of Nontuberculous Mycobacteria Infections After Cosmetic Surgery Procedures — Florida, 2022–2023

Authors: Katharine E. Saunders, J. Reyes, L. Cyril, S. Colter, J. Erskine, M. Mitchell, K. McNamara, J. Hunter, K. Perkins,
A. Charles

Background: *Mycobacterium abscessus* is an intrinsically multidrug-resistant, rapidly growing nontuberculous mycobacteria (NTM) species known to cause healthcare-associated infections. On February 7, 2023, CDC notified Florida Department of Health (FDOH) of a non-Florida resident with NTM infection after a cosmetic procedure at a surgery clinic (Clinic A) in South Florida. FDOH investigated to identify additional cases, determine epidemiologic links, and assess infection control practices in these settings

Methods: A case was defined as *M. abscessus* isolated in a wound culture from a patient who underwent cosmetic procedures at Clinic A during August 20–December 9, 2022. On March 3, 2023, FDOH conducted on-site infection control assessment at Clinic B, which operated with the same staff and protocols as Clinic A, because of Clinic A's temporary closure. FDOH and CDC issued national *Epi-X* notices in March 2023 to solicit additional cases.

Results: Of 19 reported infections, 15 case patients from 9 states were identified (73% non-Florida residents). Mean patient age was 35 years (range: 24–51 years); mean time from surgery date to symptom onset was 67 days (range: 33–119 days). Patients reported swelling, purulent drainage, redness, or pain at surgical sites. Six (40%) patients required intravenous antibiotic treatment. No deaths were reported. We identified gaps in environmental cleaning practices, proper personal protective equipment uses, and surgical device reprocessing.

Conclusions: Collaboration among health jurisdictions and CDC was crucial in identifying this cluster because NTM infections are not nationally notifiable, and patients resided in multiple states. Subsequent case finding required active surveillance to encourage reporting. Although we were unable to identify the source of the outbreak at Clinic A, site assessment at Clinic B identified gaps in infection control that can contribute to NTM transmission. Healthcare providers should have substantial suspicion for NTM infection when evaluating patients for postsurgical infection after cosmetic procedures.

CONCURRENT SESSION C1: Global Health

3:15–5:00 pm

Moderators: John Rossow & Carl Reddy

3:20 Consecutive Seasonal Epidemics of Bacterial Meningitis — Zinder Region, Niger, 2020–2023

Authors: Isha Berry, V. Pinell-McNamara, J. Kekeisen-Chen, E.I. Tassiou, K. Moussa, D. Chaibou, Z. Maman, M. Kourouma, C. Lingani, A. Bita, R. Katsande, K. Fernandez, L. Pezzoli, S. Ousmane, N. Cureau, H. Marjuki, F. Tarbangdo, F. Acho, A. Aboubacar, F. Aké, A. Latt, L. McNamara, J.C. Neatherlin

Background: Bacterial meningitis is hyperendemic in Niger, with *Neisseria meningitidis* (Nm) being the primary cause of outbreaks. Outbreaks typically occur during the dry season (December–June). A reactive vaccination campaign for Nm should be considered when weekly incidence surpasses the epidemic threshold set by the World Health Organization (WHO). We describe temporal and spatial patterns of bacterial meningitis outbreaks in Niger's Zinder Region during 2020–2023 to inform future reactive vaccination strategies.

Methods: We used WHO's Enhanced Meningitis Surveillance Dashboard to identify dates when district-level alert and epidemic thresholds (3–9 cases and ≥10 cases per week per 100,000 inhabitants, respectively) were crossed in Zinder Region's five most affected districts (Dungass, Magaria, Matameye, Mirriah, and Zinder Ville). To determine when subdistrict thresholds were crossed, we calculated weekly incidences of suspected meningitis using case surveillance data reported to the Ministry of Health and subdistrict-level census population estimates. We mapped where and when thresholds were crossed and summarized time lags between subdistrict- and district-level threshold crossings.

Results: Across three meningitis seasons, 3,876 suspected cases were reported in the five districts: 828 during 2020–2021; 1,154 during 2021–2022; and 1,894 during 2022–2023. Nm serogroup C was the predominant pathogen in all seasons. While the same four districts crossed alert and epidemic thresholds across multiple seasons, the specific subdistricts crossing the epidemic threshold changed each season. Neighboring subdistricts experienced epidemics in consecutive seasons. The median delay between subdistrict-level and district-level threshold crossings was 3 weeks (range: 1–13) for alerts and 4.5 weeks (range: 1–15) for epidemics.

Conclusions: Subdistrict-level analyses enable earlier detection of areas crossing the epidemic threshold, facilitating timely response, including reactive vaccination campaigns. As subdistricts crossing the epidemic threshold changed each season, expanding campaigns to neighboring subdistricts or districts might prevent the spread of outbreaks during subsequent seasons.

3:40 A Gastrointestinal Anthrax Outbreak in a Rural Tribal Community Linked to Consumption of Ill Livestock Meat — Koraput District, Odisha, India, May 2023

Authors: Amit Pritam Swain, D. Arya, H. Thukral, N. Krishnan, M. Kumar, R. Chandra, A. Shewale, T. Dikid

Background: Gastrointestinal anthrax in humans has 50% case fatality rate if untreated. Koraput, an anthrax-endemic district, reported a suspected anthrax outbreak in May 2023. We investigated to describe the epidemiology and identify the risk factors.

Methods: We defined a case-patient as skin lesions/abdomen pain/vomiting/diarrhea and linkage to sudden livestock death in Village X, Koraput District, from March 15–May 25, 2023. Case-patients were searched house-to-house, and blood samples were tested for *Bacillus anthracis* by PCR. We also interviewed animal husbandry stakeholders, reviewed livestock deaths and vaccination records. We conducted an unmatched 1:2 case-control study. Controls were symptom-free residents from neighborhood households. We collected demographic, exposure, and livestock information using a structured questionnaire. Odds ratio (OR) and adjusted OR (aOR) were calculated with 95% confidence interval (CI).

Results: We identified 38 anthrax case-patients (60% females), no deaths, and 20% (38/192) attack rate in the tribal community. Median age was 38 years (IQR 20–50), and 68% (26) case-patients were reported between 1–7 May. Of the 38 case-patients, 97% had gastrointestinal symptoms; one reported skin bulla, and 92% reported consuming ill livestock meat. One of four blood samples was positive for *B. anthracis*. There were 24 sudden livestock deaths (from 20 case-patient households) reported during the outbreak period. The index case-patient was identified 19 days following initial livestock deaths. Among case-patients, 92% (35/38) consumed ill livestock meat compared to 15% (11/76) control (OR = 69, 95% CI: 18–263 and aOR = 52, 95% CI: 11–234). No human-animal health data sharing existed in Koraput, with last livestock vaccination (50%) for anthrax in Village X reported in 2021.

Conclusions: We confirmed gastrointestinal anthrax outbreak associated with consuming ill livestock meat. Community sensitization was done to avoid consumption of ill livestock meat. We recommended annual livestock vaccination and communication of sudden livestock deaths between animal and human health department for rapid response.

4:00 HPV Vaccine Knowledge and Attitudes Among Healthcare Providers Before Introduction to National Schedule — Kazakhstan

Authors: Feruza Ablimitova, D. Nabirova, U. Gubareva, M. Smagul, R. Horth

Background: In 2024, Kazakhstan will reintroduce the human papillomavirus HPV vaccine into the immunization schedule. This is 10 years after a pilot HPV introduction in 2013 proved unsuccessful. Healthcare providers play a vital role in success of new vaccine uptake. We aimed to establish baseline knowledge and attitudes towards HPV vaccination among providers to support with preparation of rollout of vaccines.

Methods: We conducted a cross-sectional study in April–May 2023 of all healthcare providers responsible for vaccinations in 29 of 36 public and 5 private polyclinics in Almaty. They completed online questionnaires. Adequate knowledge about HPV was categorized as scoring >70% on knowledge questions. We used chi-square test to detect differences between professions.

Results: Of 1053 participants, 69% were nurses, 24% family practitioners, and 7% pediatricians. Majority (93%) were female, and 42% had under 18-year-old children. Proportion with adequate knowledge about HPV vaccine was 12%. Specifically, 34% did not know that HPV infection causes cervical cancer, 39% believed that HPV infection causes meningitis, and 32% believed HPV is transmitted by airborne droplets. Adequate knowledge was highest among pediatricians and lowest among nurses (40% and 23%, P <0.01). For vaccine attitudes, 19% agreed or strongly agreed that HPV vaccination increases the risk of sexual activity, 30% that HPV vaccination is more dangerous than HPV vaccination, and 17% that HPV vaccines cause infertility. Less than one-third (28%) agreed the vaccine should be included in the national schedules, and just 35% would recommend the vaccine to their patients.

Conclusions: We found suboptimal knowledge and attitudes towards HPV vaccines. These results demonstrate the need to prioritize the rollout of a vaccine education, communication, and advocacy strategy for all healthcare providers who will be directly involved with HPV vaccination prior to the national introduction of the vaccines in 2024 so as not to risk another rollout failure.

4:20 HIV Risk Factors, Testing, Diagnosis, Use of Prevention Methods, and Violence by Disability Status Among Adolescent Girls and Young Women — Eswatini, 2022

Authors: Ghenet T. Besera, F.B. Annor, E. Swedo, L.F. Chiang, S. Charania, M. Li, P. Mndzebele, A. Laterra, J. Hegle, T. Mkhonta, K. Mills, S. Felton, G.M. Massetti

Background: In Eswatini, adolescent girls and young women (AGYW) are disproportionately impacted by HIV, with an estimated prevalence of 11.7% among AGYW aged 15–24 years, compared to 4.1% of adolescent boys and young men. Due to stigma and inaccessibility of services, among other factors, AGYW with disabilities may be particularly vulnerable to HIV infection, risk factors, and behaviors and face barriers to prevention, testing, and treatment. We examined the prevalence of functional disability and compared HIV risk factors, testing, status, and use of HIV prevention methods by functional disability among AGYW in Eswatini.

Methods: We analyzed data from females (n = 6,318) aged 13–24 years from the 2022 Eswatini Violence Against Children and Youth Survey, a nationally representative household survey. We calculated weighted prevalence of having ≥1 functional disability in any domain (vision, cognition, mobility, self-care, independent living, and communication). We then calculated weighted estimates for select HIV risk factors (lifetime sexual violence, physical violence, and transactional sex), ever tested for HIV, HIV status, pre-exposure prophylaxis (PrEP), and post-exposure prophylaxis (PEP) use by disability. Data were self-reported, and HIV status was ascertained via self-report or rapid testing. We used chi-square tests to examine statistically significant differences (P <0.05) by functional disability.

Results: Among AGYW, 14.0% (95% CI:12.5–15.5) had a functional disability. Compared to AGYW without disabilities, significantly more AGYW with disabilities experienced sexual violence (14.4% vs 7.1%, P <.0001), physical violence (16.5% vs 9.5%, P <.0001), and were HIV positive (9.3% vs 6.2%, P = 0.02). No statistically significant differences were observed in lifetime transactional sex, HIV testing, and PrEP or PEP use.

Conclusions: AGYW with disability vs without disability in Eswatini had a higher prevalence of HIV and lifetime violence. These findings highlight the importance of accessible HIV and violence prevention strategies to reduce vulnerability to violence and HIV among AGYW with disabilities.

4:40 Longitudinal Virologic Outcomes of Adults With HIV on Tenofovir, Lamivudine, and Dolutegravir in Federal Capital Territory, Nigeria — 2017–2023

Authors: Olutomi Sodeke, K. Milligan, S. Vallabhaneni, T. Efuntoye, O. Orisawayi, S. Danjuma, I. Ezeuko, A. Emeh, C. Obanubi, A. Oladipo, D. Onotu, H. Chun, A. Abutu

Background: Tenofovir, lamivudine, and dolutegravir (TLD) is recommended first-line antiretroviral therapy worldwide for people living with HIV (PLHIV) due to its efficacy in achieving viral suppression. To inform optimal management of HIV viremia on TLD, we examined viral load (VL) outcomes of a large cohort of adult PLHIV on TLD in Nigeria.

Methods: We conducted a retrospective analysis of longitudinal data from PLHIV aged >15 years who had ≥1 VL after initiating TLD during January 2017–February 2023. VLs were categorized as undetectable (≤50 copies/mL), low low-level viremia (LLV, 51–199 copies/mL), high LLV (200–999 copies/mL), virologic non-suppression (VLNS, ≥1000 copies/mL), and virologic failure (VF, >2 consecutive VLNS results). Among patients with ≥2 VLs on TLD, we described how viremia changed over time and examined virologic outcomes after VF. We identified predictors of subsequent VLNS using mixed-effects logistic regression.

Results: Analysis of 82,984 VL pairs from 47,531 patients demonstrated viral suppression to ≤50 copies/mL at follow-up VL in 66.7% of those with initial low LLV, 59.1% of those with initial high LLV, and 48.9% of those with initial VLNS. Of 662 patients with a follow-up VL after VF, 94.6% stayed on TLD; of which 57.8% (359/621) were undetectable at next VL without regimen change. Previous low LLV (aOR: 1.74, 1.56–1.93), high LLV (aOR: 2.35, 2.08–2.65), and VLNS (aOR: 6.45, 5.81–7.16) were associated with increasingly higher odds of subsequent VLNS, whereas a previously undetectable VL (aOR: 1.08, 0.99–1.71) on TLD was not.

Conclusions: Despite increased odds of subsequent VLNS, most PLHIV with detectable VLs on TLD, including those with VF, will resuppress to an undetectable VL without a regimen change. Because our data suggests the detectably viremic population on TLD will be relatively small, targeted interventions to improve medication adherence may not be cost-prohibitive for lower-resourced countries.

CONCURRENT SESSION C2: Environmental Health

3:15–5:00 pm

Moderators: Andrea Winquist & Chris Reh

3:20 Association of Social Vulnerability and Acute Releases of Toxic Substances Incidents: National Toxic Substance Incidents Program — 9 States, 2010–2014

Authors: Marisol Valenzuela Lara, A. Lavery, S. Konkle, A. Dent

Background: During 2010–2014, the National Toxic Substance Incidents Program (NTSIP) monitored acute releases of toxic substances (ARTS). Social factors, including poverty, lack of transportation, and language barriers, may weaken a community's ability to prepare for, respond to, and recover from public health emergencies. However, the characteristics of communities impacted by ARTS have not previously been analyzed. We used the CDC/ATSDR Social Vulnerability Index (SVI) to analyze the association between social vulnerability factors, overall SVI percentile ranking, and the number of ARTS incidents.

Methods: We performed an ecological study analyzing NTSIP county-level data collected by the nine participating states during 2010–2014 (n = 631 counties) and SVI 2014 data. For each county, SVI 2014 calculated a percentile rank (across all US counties) for each of 15 social factors. Those percentile ranks are combined to create an overall percentile ranking and rankings for four specific themes: Socioeconomic Status, Household Composition/Disability, Minority Status/Language, and Housing Type/Transportation. We assessed relationships between the annual number of ARTS incidents and (1) overall SVI percentile ranking and (2) all four themes using linear regression models with state random intercepts.

Results: Participating states reported 13,522 incidents in 484 counties. While higher vulnerability in the overall SVI ranking was not associated (β = -0.48; P = 0.85) with ARTS, higher vulnerability for minority/language theme was associated with more incidents (β = 26.87, P <0.01). Higher vulnerability in socioeconomic status theme (β = -7.88; P = 0.02) and household composition/disability theme (β = -5.56; P = 0.03) were associated with fewer incidents.

Conclusions: Results highlight the importance of considering English proficiency in ARTS disaster communications. Differences in the association directionality of individual themes might explain the lack of overall SVI percentile rank association. To address health inequities and support evidence-based preparedness efforts, a surveillance system that monitors the population's health effects of ARTS is essential.

3:40 Clinical Characteristics and Factors Associated With Hospitalization During the Largest Documented Blastomycosis Outbreak in the United States — Delta County, Michigan, 2023

Authors: Ian P. Hennessee, S. Palmer, R. Reik, A. Miles-Jay, M. Yasir Nawaz, M. Snyder, R.L. Yin, A. Litvintseva, L. Parnell, L. Gade, M. de Perio, M.G. Stobierski, J. McFadden, M. Toda

Background: Blastomycosis is an environmentally acquired fungal infection that can result in severe pulmonary illness and high rates of hospitalization. In 2023, a blastomycosis outbreak was detected among workers at a paper mill in Delta County, Michigan. We assessed patient clinical characteristics and factors associated with hospitalization to guide public health recommendations.

Methods: Case patients were defined as those with clinical and laboratory evidence of blastomycosis as defined by the Council of State and Territorial Epidemiologists who had spent ≥40 hours in Delta County since 9/1/2022 and had illness onset 12/1/2022–7/1/2023. We assessed clinical features of cases through phone interviews and medical chart reviews and compared characteristics of hospitalized and non-hospitalized patients using Pearson's Chi-squared tests. We performed whole genome sequencing to characterize genetic relatedness of *Blastomyces* isolates from eight patients.

Results: In total, 121 blastomycosis case patients were identified; all had worked at or visited the mill. Sixteen (13%) patients were hospitalized; one died. Compared with non-hospitalized patients, hospitalized patients more frequently had dyspnea, fever, and weight loss (P <0.05) and urine antigen titers above the limit of quantification (P <.001). Hospitalized patients were also more likely to have ≥1 healthcare visits before being tested for blastomycosis (P = .003) and receive ≥1 rounds of antibiotics for presumed bacterial pneumonia before antifungal treatment (P = .005). All isolates were identified as *Blastomyces gilchristii* and were closely genetically related as part of a distinct outbreak cluster.

Conclusions: This was the largest documented blastomycosis outbreak in the United States. Genomic evidence corroborated epidemiological links to a single source at the mill. Higher prevalence of dyspnea, fever, and weight loss in hospitalized patients suggests that these symptoms might indicate more severe disease, in addition to elevated urine antigen titers. Early suspicion of blastomycosis and initiation of antifungal treatment might help reduce blastomycosis hospitalizations and severe disease.

4:00 Jetted Baptismal Font Linked to a Legionellosis Outbreak — Tennessee, April–May 2023

Authors: Christine M. Thomas, J. Schuman, J. Kmet, Y. Woods, L. Sentiff, D. Goonewardene, E. Roth, E. Terrell, A. Allgood, B. Conway, V. Jordan, B. Sally, T. Jones, W. Schaffner, M.M. Fill, J. Yackley, J. Dunn

Background: During May 2023, the Shelby County Health Department (SCHD) identified 3 cases of Legionnaires' disease. All patients had attended the same church. To determine the *Legionella pneumophila* source and prevent additional illnesses, SCHD and the Tennessee Department of Health initiated epidemiologic and environmental investigations at the church.

Methods: We surveyed church attendees about recent symptoms consistent with legionellosis and exposures to church water sources. A case was defined as self-reported fever, myalgia, or cough ≤14 days of attending church in a person who attended the church after April 1. We compared exposures (eg, seating location, date attended) among cases and noncases using chi-square and Fisher's exact tests. Environmental assessment of the church included collecting samples for culture from water sources.

Results: Among 35 surveyed church attendees, 15 cases were identified. Thirteen (87%) had cough, 11 (73%) fever, and 7 (47%) myalgia during April 24–May 8. Eight (53%) persons had both abnormal chest radiograph results and positive urinary antigen tests for *L. pneumophila* serogroup 1 (Lp1). Six (40%) did not have *L. pneumophila* testing, and 1 (7%) had a negative urinary antigen test. Clinical specimens were not available for culture. Six (40%) persons were hospitalized; none died. We did not identify any substantial association between church exposures and legionellosis. On May 8, we collected 17 environmental samples from church locations, including the bathrooms, kitchen, and baptismal font. Five samples tested positive for Lp1 by culture, including 4 that were collected from a large jetted baptismal font. We provided recommendations for baptismal font maintenance and church water system flushing.

Conclusions: Environmental sampling was vital in this investigation to identify the likely source of legionellosis as a large, jetted baptismal font and subsequently make remediation recommendations. This outbreak reveals a need for legionellosis education and mitigation strategies tailored to faith-based organizations.

4:20 *Pseudomonas* Infection Outbreak Associated With a Hotel Swimming Pool — Maine, March 2023

Authors: Liz Lamere, E. Smith, H. Grieser, M. Arduino, M.C. Hlavsa, S. Combes

Background: The Maine Center for Disease Control and Prevention (Maine CDC) received multiple reports of persons who developed ear pain, rashes, or redness or pain of the hands or feet after using a hotel pool during March 4–5, 2023. In response, Maine CDC investigated to determine outbreak etiology and magnitude.

Methods: We interviewed a representative from each household initially reporting illness; the interviewee was asked to name others who also used the pool, and those persons were interviewed. The hotel provided a list of March 1–7 guests; a questionnaire was sent to guests who had not previously been interviewed. We asked guests about their use of the hotel pool, other pools, or hot tubs since February 26 and symptoms experienced; we encouraged symptomatic guests to seek laboratory testing. The pool was inspected on March 8.

Results: Thirty-five guests were interviewed or responded to the questionnaire; 26 (74%) guests used the pool during March 4–5, including 23 (88%) who reported symptoms including rash, earache, or pain or swelling in the feet or hands. Symptom onset occurred a median of 24 hours (range: 8 hours–6 days) after pool use. *Pseudomonas aeruginosa*, a chlorine-susceptible bacterium, was identified in skin cultures from 3 symptomatic patients; isolates were found to be highly related with only a 2 single nucleotide polymorphism difference, suggesting a common exposure. Multiple health code violations were identified, including lapses in logging free chlorine concentrations and no functioning disinfectant feeder; similar violations had been identified during a prior routine inspection.

Conclusions: We identified an outbreak of *P. aeruginosa* infections associated with a hotel pool that had prior health code violations. Adherence to published pool codes, including monitoring and maintaining proper water disinfectant concentration and code enforcement, can help prevent future outbreaks.

4:40 Community Assessment of Chemical Exposure After a Train Derailment — East Palestine, Ohio and Darlington, Pennsylvania, February–March 2023

Authors: Melissa Dulcey, D.S. Shi, V. Parasram, K. Burr, E.A.G. Faherty, B. Gichuhi, V. Madera-Garcia, C.A. Crisp, D.M. Cornforth, L. Goldsworthy, C. Dewart, K. Sneeringer, W. Vins, K. Dickerson, S.M. Watkins, J. Shugart, T. Larson, M.F. Orr

Background: On February 3, 2023, a train carrying hazardous substances derailed in East Palestine, Ohio, near the Pennsylvania border, resulting in a fire and release of contents. Three days later, safety crews conducted a controlled vent and burn of potentially explosive rail cars. Authorities in Ohio and Pennsylvania requested assistance from CDC and ATSDR to investigate potential health effects of chemical exposures among the community and guide additional response efforts.

Methods: During February 21–March 31, 2023, a voluntary Assessment of Chemical Exposure (ACE) cross-sectional survey was conducted in East Palestine, Ohio, Darlington, Pennsylvania, and surrounding areas. The survey assessed community members' potential exposures, symptoms, medical care received, location, evacuation status, and post-derailment needs. Surveys were completed in person at temporary health centers, during door-to-door canvassing, or online through a self-administered survey. At health centers, residents were directly linked to resources (ie, home air and water quality testing, food vouchers, and mental health and healthcare referrals).

Results: In total, 701 participants completed surveys: 458 (65%) at health centers, 193 (28%) online, and 50 (7%) during door-to-door canvassing. Among participants, 654 (93%) reported ≥1 new or worsening symptom since the derailment; most frequently reported symptoms involved ears, nose, and throat (560; 86%), neurologic (530; 81%), and mental health concerns (493; 75%). Many residents (307; 44%) reported ongoing needs after the derailment, including needing drinking water (181; 59%), medical care (63; 21%), and mental health care (61; 20%).

Conclusions: Most respondents reported new or worsening preexisting symptoms in the 8 weeks after the derailment. Conducting ACE surveys in health centers directly linked community members to onsite resources and clinical and mental health care referrals. This investigation provided local and state jurisdictions with information needed to focus community response efforts during an environmental emergency.

CONCURRENT SESSION D1: HIV and Viral Hepatits

9:00–10:45 am

Moderators: Katie Curran & Alexa Oster

9:05 HIV Cluster Among Gay, Bisexual, and Other Men Who Have Sex With Men — Alaska, 2023

Authors: Rini Jose, S. Brewster, C. Agnew-Brune, K. Curran, D. Descamps, T. Holsinger, R. McClung, J. McLaughlin, E. Ohlsen, A. Oster, S. Perez

Background: In 2023 Alaska Department of Health (AKDOH) requested CDC support responding to a potential cluster of HIV infections in the Interior Region among gay, bisexual, and other men who have sex with men (MSM). AKDOH reported 10 new HIV diagnoses in 2022, compared to a prior annual average of three. We investigated and characterized the cluster to understand factors influencing HIV transmission and barriers to HIV prevention services.

Methods: Cluster members were defined as people with a confirmed HIV diagnosis during December 2021–September 2023 residing in the Interior Region or people with an epidemiological or close molecular link (through HIV nucleotide sequence analysis) to a cluster member. We analyzed HIV surveillance and partner services data to descriptively characterize the cluster. We conducted qualitative interviews during July–August 2023 with purposively sampled cluster members and their sex partners. Interviews focused on experiences accessing HIV testing, prevention, and treatment services. We analyzed interview data using a thematic content approach.

Results: As of September 2023, we identified 24 cluster members. All identified as cisgender men, and 21 (88%) reported male-to-male sexual contact. We interviewed 11 cluster members and three sex partners without HIV and identified two key themes. First, missed opportunities for providing HIV prevention services contributed to HIV transmission. For example, participants described never learning about HIV pre-exposure prophylaxis (PrEP) during clinical encounters. Second, stigma related to sexual identity and HIV negatively affected participants' ability to engage in HIV prevention and fueled misinformation about HIV transmission.

Conclusions: Missed opportunities and stigma influenced HIV transmission and limited access to HIV prevention services in this Alaskan region. Our findings informed new recommendations, including providing training to providers on assessing PrEP eligibility, improved PrEP education for MSM, addressing HIV misinformation, and increasing sexual and gender identity inclusivity in community and clinical spaces.

9:25 Hypertension Prevalence and Control Among People With and Without HIV — United States, 2022

Authors: Xingran Weng, K. Hoover, Y. Huang, K. Buchacz, J. Li, R. Woodruff, A. Thompson-Paul, L. Kompaniyets, S. Jackson

Background: People with HIV (PWH) have higher rates and earlier onset of cardiovascular disease (CVD) than people without HIV. Among PWH, little is known about the prevalence and control of hypertension, a preventable CVD risk factor. This study estimated hypertension prevalence, control, and risk factors by HIV status.

Methods: This cross-sectional study included patients (≥18 years) in the 2022 IQVIA™ Ambulatory Electronic Medical Record-US data. HIV was identified by ≥2 HIV diagnoses on separate visits or a positive HIV test. Hypertension was identified by diagnosis codes, ≥2 blood pressure (BP) readings ≥130/80 mmHg, or antihypertensive medication. Among those with hypertension, control was defined as most recent BP <130/80 mmHg. Crude hypertension prevalence and control were estimated by HIV status. Multivariable logistic regression models generated adjusted prevalence ratios (aPR) of hypertension and control among PWH versus people without HIV, accounting for sex, age, race, body mass index, and census region. Models among PWH assessed hypertension-associated risk factors.

Results: Among 7,533,379 patients, 19,102 had HIV (mean age 55.6 years, 72% male). PWH had higher hypertension prevalence (66% vs 54%; P <.001) and were more likely to have hypertension (aPR: 1.14; 95% CI: 1.13–1.15) compared to people without HIV. Hypertension control was also higher (30% vs 29%; P = 0.01) and more likely (aPR: 1.10; 95% CI: 1.07–1.13) among PWH than people without HIV. PWH from the South were more likely to have hypertension (aPR: 1.07; 95% CI: 1.02–1.12) than PWH from Northeastern states. Black PWH were less likely to have controlled hypertension (aPR: 0.72; 95% CI: 0.67–0.77) than White PWH.

Conclusions: PWH were more likely to have hypertension than people without HIV. Geographic and racial disparities in hypertension prevalence and control were observed among PWH. Optimal care for PWH can include comprehensive strategies to prevent and manage hypertension.

9:45 Hepatitis C Virus Treatment Initiation Among Adults Enrolled in Medicaid — Wisconsin, 2015–2022

Authors: Musheng L. Alishahi, K. Lowe, K. Mitchell, R. Westergaard

Background: Treatment for hepatitis C virus (HCV) infection is recommended for persons with current infection and is crucial to interrupt transmission. Curative, well-tolerated, highly effective, direct-acting antiviral treatment became available during the mid-2010s; however, state-level policies have restricted access. To increase HCV treatment, Wisconsin Medicaid policy was changed to remove specialist and disease severity requirements (2018), sobriety requirements (2020), and prior authorization requirements (2021). To guide strategies for statewide hepatitis elimination, Wisconsin Department of Health Services assessed trends in treatment initiation among Medicaid enrollees after policy changes.

Methods: We included patients with positive HCV RNA tests in the Wisconsin Electronic Disease Surveillance System (WEDSS) and matched patients to Medicaid enrollment and claims. We assessed trends in treatment initiation during 2015–2022 and performed regression analysis comparing treatment rates during the most restrictive time period (2015–2018) with the less restrictive period (2019–2021) and period of no restrictions (2022). Models were adjusted for age, gender, race and ethnicity, length of Medicaid enrollment, and county.

Results: Of 21,577 HCV WEDSS reports, 10,780 (50.0%) were patients enrolled in Medicaid at the time of or after HCV diagnosis. Overall, 1,463 (13.6%) initiated HCV treatment during the 8-year period. Treatment initiation decreased from a high of 17.8% (283/1,588) in 2017 to 6.7% (54/808) in 2022. Compared with treatment rates during the most restrictive period, patients were 35% less likely to initiate treatment after sobriety, specialist, and disease severity policy restrictions were removed (adjusted odds ratio [aOR]: 0.65; 95% CI: 0.52–0.81), and patients were 55% less likely to initiate treatment after all policy restrictions were removed (aOR: 0.45; 95% CI: 0.37–0.54).

Conclusions: Policies seeking to increase treatment access were not associated with increased treatment rates. Further investigation is needed to determine barriers to HCV treatment implementation beyond policy, including patient and provider education.

10:05 Rural-Urban Differences in HIV Care Outcomes in the Southern United States, 2019

Authors: Barbara C. Keino, K. Hess, C. Jin, S. Johnson Lyons, Z. Gant Sumner

Background: Over half of US persons with HIV diagnosed in 2019 lived in the South. Place of residence and population group disparities in access to medical care may perpetuate poor HIV care outcomes and impede national HIV prevention goals. We used HIV surveillance data and census-tract level rural-urban definitions to assess geographic and population group differences in HIV care outcomes in the South.

Methods: We described HIV diagnoses, linkage to HIV care (LC) within one month of diagnosis, and viral suppression (VS) within 6 months for adults (aged ≥18 years) living in the South (14 states and D.C.) who received an HIV diagnosis in 2019 (N = 19,339), stratified by rural-urban residence and race/ethnicity. Data were obtained from CDC's National HIV Surveillance System; residence at diagnosis was defined as rural or urban using USDA's Rural-Urban Commuting Area codes.

Results: Most HIV diagnoses in the South occurred in urban tracts (91.4%). The proportion of diagnoses in urban tracts ranged from 64.5% for American Indian/Alaska Native (AI/AN) to 97.0% for Asians. Persons in rural tracts achieved slightly lower LC (76.3%) and VS (63.8%) compared to urban (LC: 78.5%, VS: 65.7%). Rural-urban differences were more pronounced when stratified by race/ethnicity. Care outcomes were notably lower for AI/AN persons living in rural areas (LC: 63.6%; VS: 40.9%) compared to those in urban areas (LC: 72.5%; VS: 63.6%). Although LC among Hispanic/Latino persons did not differ between rural and urban areas (83.0%), VS was lower for those residing in rural tracts (62.9%) compared to urban (71.0%).

Conclusions: Rural populations, especially AI/AN and Hispanic/Latino persons, experienced lower HIV care outcomes compared to their counterparts in the South. Tailored interventions, such as culturally appropriate HIV care services in rural areas, are needed to address gaps in care and achieve national HIV prevention goals.

10:25 Improvements in Hepatitis C Cure and Clearance Rates Among Persons With Hepatitis C Mono-Infection and HIV Coinfection — Philadelphia, 2015–2022

Authors: Marissa L. Tan, D. Kuncio, E. Addish, T. Nassau, D. Higgins, M. Miller, K. Brady

Background: HIV/Hepatitis C virus (HCV) coinfection increases risk for cirrhosis and death, compared to HCV mono-infection. In recent years, HCV care in Philadelphia expanded with pan-genotypic, directly acting antiviral medications to cure HCV, Medicaid policy changes, and citywide programming (2016–2019) for persons with HIV/HCV coinfection. For persons with HIV, use of Ryan White HIV/AIDS Program (RW) services is associated with quicker time to HIV viral suppression. We sought to evaluate factors associated with HCV clearance in recent time periods to guide treatment efforts for patients with newly diagnosed illness in Philadelphia.

Methods: We used Philadelphia HCV surveillance data to identify persons receiving a new diagnosis during two periods (November 2015–October 2018 and November 2018–October 2021) and matched persons with HIV coinfection using HIV surveillance data. Cox regressions were used to estimate time to HCV clearance by period and HIV coinfection, adjusting for demographic factors. We used a Cox model to compare HCV clearance among coinfected persons receiving ≥1 of 22 RW services, ranging from housing to medical case management.

Results: There were 9,898 and 353 new HCV cases among persons with mono-infection and HIV coinfection, respectively. HCV clearance was higher among those diagnosed during November 2018–October 2021, compared with those diagnosed during November 2015–October 2018 (hazard ratio [HR] = 1.62; 95% CI: 1.51–1.74) and among coinfected persons, compared with HCV mono-infected persons (HR = 1.21; 95% CI: 1.04–1.41). Among coinfected persons, HCV clearance was higher among those receiving ≥2 RW (HR = 1.63; 95% CI; 1.01–2.61) and those receiving ≥4 RW (HR = 3.25; 95% CI: 1.85–5.73) per month than those receiving no RW services.

Conclusions: HCV clearance rates improved in recent years. Holistic care models and infrastructure like the RW program could improve HCV cure rates among mono-infected persons.

CONCURRENT SESSION D2: Respiratory Diseases

9:00–10:45 am

Moderators: Jennifer Liang & Manisha Patel

9:05 Bottleneck and Enabler Evaluation of Avian Influenza Health Event — Guatemala, January–February 2023

Authors: Parsa Bastani, E. Bailey Leonardo, J.C. Monzon Fuentes, K.M. Polanco Kepfer, E. Zielinski Gutierrez, P. Suchdev

Background: In February 2023, H5N1 was identified in 11 wild pelicans in Izabal, Guatemala. These were the first known cases of H5N1 in Guatemala. A benchmark for evaluating outbreak response is the Resolve to Save Live's "7-1-7" initiative, which proposes the following timeliness metrics: 7 days for detection, 1 day for notification, and 7 days for completing an early response. This study identified bottlenecks and enablers in the government's response to this One Health event.

Methods: Open-ended interviews regarding the government's response were conducted in Spanish or English in September 2023. Using purposive sampling, we interviewed nine key informants from the Ministry of Agriculture (MAGA) and the Livestock and Food, and the Ministry of Health and Social Assistance (MSPAS) who were involved in the event, including epidemiologists, laboratory analysts, and other staff. Interviews were analyzed using UNICEF's "Human-Centered Design 4 Health" approach to qualitative fieldwork.

Results: Key informants were unable to provide data on detection because they did not know the date of pelican symptom onset. Notification took one day, and early response was completed in 36 days. Reported enablers of the response were interregional notification and cooperation, earmarked emergency funds in MAGA, event-based surveillance, and support from laboratories across public and private sectors. Reported bottlenecks were limitations in inter-agency communication between MAGA and MSPAS, rapid response workforce availability, and training and equipment for fieldwork.

Conclusions: This outbreak response did not meet the 7-1-7 benchmark. The 7-day detection timeliness metric may not be amenable to events involving wildlife; also, the completion of early response steps did not meet the 7-day metric. The avian influenza response in Guatemala could be improved by using a One Health approach, such as coordinating how communication, funds, equipment for fieldwork, and rapid response workforces are leveraged across human, animal, and environmental health sectors.

9:25 Severe Influenza Among Adults and Children Presenting to the Emergency Department for Influenza-Associated Acute Respiratory Illness, 2022–2023

Authors: Noah Kojima, E. Pun, C. Zhang, B.S. Winterton, J.A. Kline, A. Budd

Background: Influenza accounts for >40 million medical visits and >100,000 hospitalizations annually in the US. The number and severity of influenza-associated emergency department (ED) visits are less clear. We estimated the incidence of and assessed risk factors for influenza-associated hospitalizations following an ED visit among adults and children.

Methods: We used data from an electronic medical record extraction-based surveillance system (Respiratory Virus Laboratory ED Network Surveillance, RESP-LENS) with 24 surveillance sites (including 88 unique EDs) in 21 states that extract data weekly. We estimated the incidence of hospitalization rate per 1,000 visits among influenza-positive, non-pregnant adults and children following ED encounters from over the influenza season (October 2022–April 2023). We analyzed independent risk factors for hospitalization dichotomously in multivariable logistic regression using StataSE; P <0.05 was considered statistically significant.

Results: There were 19,391 laboratory-confirmed influenza-associated ED visits. Among the 9,762 adults and 9,629 children, the hospitalization rate was 249.2 (95% CI: 240.7–257.6) and 45.1 (95% CI: 40.9–49.3) per 1,000 visits, respectively. Independent association with hospitalization among adults included age ≥65 years (adjusted odds ratio [aOR]: 5.47 [95% CI: 4.93–6.08]), male gender (aOR: 1.23 [95% CI: 1.11–1.36]), White race (aOR: 1.33 [95% CI: 1.20–1.36]), and non-Hispanic or Latino ethnicity (aOR: 1.83 [95% CI: 1.59–2.09). Age ≤2 years (aOR: 2.31 [95% CI: 1.86–2.86]), American Indian or Alaska Native race (aOR: 4.05 [95% CI: 1.77–9.29]), and private or commercial health insurance (aOR: 2.83 [95% CI: 2.30–3.48]) were associated with increased odds of hospitalization among children.

Conclusions: Older adults and younger children were at increased risk of hospitalization following an influenza-associated ED encounter during an influenza A(H3N2) predominant season. Weekly data extractions from the RESP-LENS system can provide information on groups at increased risk of severe influenza throughout the season, which can inform timely public health action and support efforts to increase influenza vaccination.

9:45 Evaluation of Angelenos in Action: A Text Message-Based Syndromic Surveillance System for Respiratory Illness — Los Angeles County, 2020–2023

Authors: Jordan B. Braunfeld, E. Traub, A. Kim, A. de St. Maurice, A. Amoon, J. Buendia, P. Gounder

Background: Although viral respiratory infections cause substantial morbidity and mortality, they are underreported as medical attention is infrequently sought and virus-specific testing is not routinely performed. To overcome these limitations during the COVID-19 pandemic, Los Angeles County developed "Angelenos in Action" (AiA), a text-based community syndromic surveillance system to track respiratory symptom trends. We evaluated correlation of AiA data with other COVID-19 case and wastewater surveillance data to improve viral respiratory disease surveillance in Los Angeles.

Methods: AiA participants were recruited through social media, press releases, and digital and radio ads. Participation was monitored with a goal of 5,773 weekly respondents, which modeling had determined was minimum participation necessary to detect a change in COVID-like illness (CLI) rate. Respondents were sent a weekly symptom survey, in Spanish or English, to self-report CLI. Using linear regression, weekly CLI rates from AiA were compared with weekly average COVID-19 cases from electronic laboratory reporting during July 2020–January 2022 and with weekly average pepper mild mottle virus (PMMoV)-normalized wastewater SARS-CoV-2 RNA concentrations during January 2022–August 2023. An R2 statistic was calculated to measure goodness of fit for the model.

Results: AiA started on July 5, 2020. Participation peaked at 11,022 weekly respondents in February 2021. Weekly responses steadily declined from 9,019 in January 2022 to 5,558 in September 2023. Comparison of weekly average COVID-19 cases and CLI rates yielded an R2 of 0.945. Comparison of weekly average wastewater SARS-CoV-2 RNA concentrations and CLI rates yielded an R2 of 0.679.

Conclusions: AiA CLI rates correlated strongly with COVID-19 case counts and wastewater SARS-CoV-2 RNA concentrations. AiA maintained thousands of weekly responders; however, participation is declining. This decline can limit future representativeness, and AiA might need to repeat recruitment to function as a reliable surrogate marker of respiratory disease activity in Los Angeles.

10:05 Duration of Influenza Illness among Children Aged <18 Years Dying of Influenza — California, 2004–2023

Authors: Sophie Zhu, J. Quint, C. Penton, C. Hoover, E.L. Murray

Background: Annually, approximately 35–200 pediatric influenza deaths are reported in the United States. Certain preexisting conditions and absence of vaccination can increase risk for children to severe illness or death from influenza. Influenza-associated pediatric deaths are reportable in California. We characterized reported deaths among children who died from influenza to guide public health messaging and prevent further deaths in California.

Methods: We analyzed all influenza-associated deaths among persons aged <18 years reported in California during 2004–2023. We obtained patient and illness characteristics from case report forms and described patient demographic and clinical characteristics, including vaccination status.

Results: Among 252 influenza-associated deaths, mean age was 7.4 years (range: 0–17 years); 125 (52%) were male. In total, 152 (60%) children with ≥1 preexisting condition were identified; 37 (14%) had ≥1 documented dose of current seasonal influenza vaccine ≥2 weeks before illness onset, and 63 (25%) had a secondary bacterial infection. Most children (143; 57%) died in the intensive care unit, 56 (22%) died in the emergency department, 23 (9%) died at home or en route to the hospital, 6 (2%) died in the hospital ward, and 24 (10%) had unknown location of death. Median and mean duration of illness before death were 4 and 8.9 days (range: 0–73 days) among children without preexisting conditions and 7.5 and 15.1 days (range: 0–141 days) among children with preexisting conditions. Vaccination rates were similar among children without (10/100; 10%) and with (27/152; 17.7%) preexisting conditions.

Conclusions: Although most children who died from influenza had preexisting conditions, 40% of influenza deaths were among healthy children who experienced rapid progression to severe disease. Influenza vaccinations among children in the analysis were low. This information can inform medical care practices and future research on the potentially fatal effects of influenza, even among healthy children.

10:25 Goal! Goal! Goal! Detection of SARS-CoV-2 Variants in Travelers During the FIFA World Cup, Qatar 2022 — CDC Traveler-Based Genomic Surveillance Program — November 2022–January 2023

Authors: Katrina M. Byrd, S.M. Bart, T.C. Smith, S.M. Loh, A.P. Rothstein, S.A.J. Guagliardo, I. Ruskey, B.H. Rome, T.W.S. Aichele, E.T. Ernst, R.C. Morfino, M.S. Cetron, C.R. Friedman, A.T. Walker

Background: Over one million people traveled to Qatar and surrounding countries during the World Cup 2022 soccer tournament, a mass gathering that could enhance transmission of SARS-CoV-2 variants. Limited information about variants was available in global databases (GISAID) for the World Health Organization (WHO) Eastern-Mediterranean Region (EMRO), including Qatar, United Arab Emirates, and Saudi Arabia. The Traveler-based Genomic Surveillance (TGS) program samples arriving international travelers to detect new variants and fill surveillance gaps. Monitoring of flights from EMRO was increased during the tournament.

Methods: Travelers at six US airports volunteered to provide nasal swabs that were pooled by flight origin and sent to laboratories for SARS-CoV-2 reverse transcription polymerase chain reaction. Positives underwent whole genome sequencing. Pool positivity and variant frequencies were compared for travelers by WHO region. Chi-square tests were used to determine statistical significance.

Results: During November 20, 2022–January 2, 2023, 2050 pooled samples from 16,595 travelers were collected. Of these, EMRO contributed 100 pools (703 travelers). Other regions contributed 1950 pools (15,892 travelers). Pool positivity from EMRO was 28% (28/100) vs 25% (489/1950) from other regions (P = 0.51). Regionally detected variant proportions were: EMRO (n = 25) XBB (40%), BQ.1 (20%), BQ.1.1 (20%); Europe (n = 166) BQ.1.1 (48%), BQ.1 (20%), XBB (9%); Western Pacific (n = 51) BA.5 (24%), BN.1 (22%), XBB (18%); South-East Asia (n = 21) BQ.1.1 (33%), XBB (29%), BA.2 (10%), BA.5 (10%), XBB.1.5 (10%); and Africa (n = 15) BQ.1.1 (53%), BA.5 (27%), XBB (20%). The proportion of XBB in EMRO was significantly higher than in Europe and Western Pacific regions (P <0.05).

Conclusions: During World Cup 2022, SARS-CoV-2 positivity was similar for travelers from EMRO compared to other regions. Variant proportions differed, with EMRO having the highest proportion of XBB, a recombinant lineage associated with higher transmissibility. TGS fills gaps in SARS-CoV-2 surveillance and can be surged during mass gathering events.

CONCURRENT SESSION E1: Occupational Health

11:15 am–12:40 pm

Moderators: R. Reid Harvey & Maria de Perio

11:20 Serum Concentrations of Per- and Polyfluoroalkyl Substances Among Firefighters in the Arizona Healthcare, Emergency Responder, and Other Essential Worker Study — Arizona, July 27, 2020–April 15, 2023

Authors: Cedar L. Mitchell, J. Hollister, J.M. Fisher, S. Beitel, J. Burgess, K. Lutrick, K. Ellingson

Background: Per- and polyfluoroalkyl substances (PFAS) are widely used chemicals associated with increased risk for cancer and other adverse health effects. Certain occupations, including firefighting, have greater risk for PFAS exposure from flame-resistant materials. We sought to assess whether PFAS concentrations differed by occupation among Arizona workers to guide prevention efforts.

Methods: PFAS serum concentrations (perfluorohexane sulfonic acid [PFHxS], branched and linear perfluorooctane sulfonate [PFOS], and linear perfluorooctanoic acid [PFOA]) were measured among Arizona Healthcare, Emergency Responder, and Other Essential Worker Study participants. This included adults working >20 hours/week during the pandemic. Serum samples were collected at enrollment and routine intervals (July 27, 2020–April 15, 2023). Occupational categories included firefighters, nonfirefighter first responders, healthcare workers, and other essential workers in education, government, utility, and retail industries. We described population characteristics and fit multilevel linear regression models for each PFAS chemical to estimate differences in mean log-transformed PFAS concentrations by occupational category. We used other essential workers for comparison, adjusting for age, sex, race and ethnicity, year, and included a random intercept per county.

Results: Among 1,960 participants, 280 (14%) were firefighters, 159 (8%) nonfirefighter first responders, 787 (40%) healthcare workers, and 734 (38%) other essential workers. Median age was 46 years (range: 18–82 years), 1,233 (63%) were female, and 1,184 (60%) resided in Pima County. Adjusting for covariates, firefighters had higher PFHxS, branched and linear PFOS, and linear PFOA concentrations than other essential workers (geometric mean ratios 95% CIs: 1.26 [1.11–1.43]; 1.23 [1.10–1.38]; 1.23 [1.11–1.36]; and 1.13 [1.02–1.26], respectively). Adjusted PFAS concentrations were similar among nonfirefighter first responders or healthcare workers, compared with other essential workers.

Conclusions: PFAS chemicals were elevated among Arizona firefighters compared with other essential workers. Further study of the clinical significance and mitigation strategies for firefighters exposed to PFAS is warranted.

11:40 Urine Antigen Screening During an Occupational Blastomycosis Outbreak — Michigan, 2023

Authors: Perri C. Callaway, A. O'Connor, M. Stanton, X. Liang, J-H. Park, D. Shi, R. Bailey, R. LeBouf, R. Harvey, E. Fechter-Leggett, I. Hennessee, M. Toda, M. DePerio, S. E. Hines, J. Cox-Ganser

Background: From December 2022–May 2023, over 100 workers with blastomycosis were identified at a paper mill in the Upper Peninsula of Michigan, resulting in the largest known outbreak of blastomycosis in the United States and the first associated with a single workplace. Blastomycosis is an infection caused by the *Blastomyces* fungus, which lives in soil and decomposing organic matter. Infection can cause fever, cough, pneumonia, and, in severe cases, death. Infection may require treatment with antifungal medication. We aimed to identify mill workers with blastomycosis or exposure to *Blastomyces* and make recommendations for the current outbreak and future outbreaks.

Methods: We conducted a medical survey in April 2023 that included a work and health questionnaire and *Blastomyces* urine antigen test. Employees and contractors of the mill were invited to participate. Urine was tested using the MVista® *Blastomyces* Quantitative EIA Test, a quantitative sandwich enzyme immunoassay; a positive test indicates possible exposure to or infection by *Blastomyces*.

Results: Of 602 workers who participated in the survey, 573 workers (95%) provided urine specimens. Fifty-two specimens (9%) tested positive for *Blastomyces* antigen; 25 (48%) of these were not previously identified as cases by the state health department, including specimens from five workers who reported only one symptom and five workers who reported no symptoms at the time of survey.

Conclusions: We identified additional workers who may have been infected in this occupational blastomycosis outbreak using a urine antigen test as a screening tool. Public health officials in future outbreaks can consider *Blastomyces* antigen urine screening for possible identification of exposure or infection, which may help in the evaluation of potential sources of exposure.

12:00 Sociodemographic Characteristics Associated With COVID-19 Bivalent Vaccine Uptake Among U.S. Healthcare Personnel who Presented for COVID-19 Testing — Emerging Infections Program, United States, September 8, 2022–May 22, 2023

Authors: Elizabeth Slocum, I.D. Plumb, S. Russ, G. Dumyati, C. Meyers, J. James-Gist, A.L. Morris, K. Marceaux-Galli, S. Lovett, M. Kellogg, S. Fridkin, T.M. Markus, P.R. Cieslak, R. Pierce

Background: High vaccine coverage among healthcare personnel (HCP) is crucial to protect staff and patients from severe COVID-19 outcomes. Suboptimal uptake of COVID-19 vaccine boosters among HCP persists. Sociodemographic characteristics have been associated with differences in primary series vaccine uptake, but factors affecting bivalent booster uptake are unknown. We identified factors associated with COVID-19 bivalent booster uptake among HCP to guide education and intervention.

Methods: Data were from a nationwide CDC Emerging Infections Program COVID-19 vaccine effectiveness study. HCP with SARS-CoV-2 test results (positive or negative) during September 8, 2022–May 22, 2023, were enrolled and surveyed about COVID-19 vaccination history and sociodemographic characteristics. Among HCP who completed an mRNA primary vaccine series, outcome was defined as whether they received a bivalent booster before their test date. We used adjusted logistic regression to identify associations between sociodemographic characteristics and bivalent booster uptake, controlling for age, prior COVID-19 diagnosis, sex, race and ethnicity, education level, annual household income, type of health insurance, anticipated level of patient contact, and number of underlying health conditions.

Results: Of 1,400 enrolled HCP, 493 (35.2%) received a bivalent booster dose before their test date. Compared with HCP who identified as White non-Hispanic, Black non-Hispanic (adjusted odds ratio [aOR]: 0.47; 95% CI: 0.28–0.80), and Hispanic (aOR: 0.45; 95% CI: 0.26–0.77) race or ethnicities had lower odds of receiving a bivalent booster. Compared with HCP with a doctoral or professional degree, having a college degree (aOR: 0.43; 95% CI: 0.31–0.59) or no college degree (aOR: 0.32; 95% CI: 0.19–0.54) had lower odds of receiving boosters.

Conclusions: Among HCP, bivalent vaccine uptake varied by sociodemographic characteristics. This highlights a need to better understand reasons for these differences so appropriate educational and intervention strategies can be designed to increase uptake among HCP.

12:20 Prevention Practices, Associated Barriers, and Training Opportunities to Reduce TickBorne Disease Among Public Outdoor Workers — New Jersey, 2023

Authors: Emma R. Price, G. Keefer, S. Vemprala, K. Reale, D. Lefkowitz, M. Borjan, K. Cervantes

Background: Tickborne disease incidence is high in New Jersey. Although outdoor workers are at increased risk, tick prevention training is infrequently provided to public outdoor employees. We assessed New Jersey public outdoor workers' attitudes and prevention practices regarding tick encounters to identify training and employer opportunities to reduce tickborne disease risk.

Methods: In this cross-sectional descriptive analysis, we established a list of liaisons from local health departments and state agencies employing outdoor workers in New Jersey. We developed an online survey and requested liaisons forward it by email to public outdoor employees and post a flyer with a survey link in their buildings. Eligible employees stated they worked more than two-thirds of their job outdoors during 2022.

Results: Overall, 138 eligible respondents answered ≥1 of 74 questions. Twenty-five of 107 (23.4%) respondents rarely or never applied insect repellent; of those, 12 (48.0%) cited safety concerns. Fifty-four of 106 (50.9%) respondents rarely or never used permethrin-treated clothing; of those, 17 (31.5%) cited safety concerns, and 16 (29.6%) denied knowledge of it. Among 96 who reported employer-provided prevention supplies, 32 (33.3%), 43 (44.8%), and 31 (32.3%) did not receive insect repellent, long-sleeved clothing, or permethrin, respectively. Forty-nine of 98 (50.0%) were unsure of or denied employer-provided tick prevention information. If employers provided insect repellent, long-sleeved clothing, and permethrin-treated clothes, 81/96 (84.4%), 86/94 (91.5%), and 75/95 (78.9%) of respondents stated they would likely use the item, respectively. Sixty-eight (71.6%) and 57 (60.0%) of 95 respondents requested tickborne disease and postexposure prophylaxis information, respectively.

Conclusions: Among responding public outdoor workers, employer provision and employee use of tick prevention supplies could be improved. Employer provision of supplies, along with tickborne disease and postexposure prophylaxis information, might be welcomed and mitigate tickborne disease among New Jersey outdoor workers.

CONCURRENT SESSION E2: Pediatric Vaccines and Infections

11:15 am–12:40 pm

Moderators: Michelle Lin & Priti Patel

11:20 Human Papillomavirus Vaccination Coverage Among Girls and Boys in the United States: A Birth Year Cohort Analysis of the National Immunization Survey-Teen — 2016–2022

Authors: Ponesai Nyika, D. Yankey, L.D. Elam-Evans, S. Meyer, C. Pingali, S. Stokley, J.A. Singleton

Background: Human papillomavirus (HPV) causes approximately 37,000 cancers in the United States annually. HPV vaccine, recommended by CDC at age 11 or 12 years, prevents more than 90% of HPV-attributable cancers. We aim to identify coverage gaps to inform targeted interventions.

Methods: We conducted a birth cohort analysis among adolescents born 1999–2009 using National Immunization Survey-Teen (NIS-Teen), a random-digit dialed telephone survey which also collects vaccination data from providers. We analyzed 131,553 records from 2016 to 2022 NIS-Teen data to determine: 1) trends in coverage with ≥1 HPV vaccine dose before age 13 years (on-time vaccination), 2) cumulative coverage from 13 to 17 years (catch-up), 3) missed vaccination opportunities (provider visits before age 13 years where HPV unvaccinated adolescents received other recommended vaccine but not HPV vaccine), and 4) achievable coverage if HPV vaccination opportunities were not missed. Regression analysis provided the average percentage increase in coverage across birth cohorts. The Kaplan-Meier method provided cumulative HPV vaccination coverage from age 13 to 17 years, stratified by birth cohorts.

Results: HPV vaccination coverage before 13 years increased from 14.4% among adolescents born in 1999 to 51.8% among adolescents born in 2009. Coverage for girls increased from 22.7% to 54.3%; coverage for boys increased from 6.4% to 49.1%. Overall, coverage increased from 33.1% before age 13 years to 74.9% before age 18 years. Among the 38,568 (29.3%) who had not received any HPV vaccination, 31,513 (82.5%) had ≥1 missed HPV vaccination opportunity. The potential achievable vaccination coverage if opportunities were not missed was 94.8%.

Conclusions: On-time HPV vaccination coverage increased by birth cohort among adolescents born 1999–2009 but remains suboptimal. Opportunities for HPV vaccination before age 13 years are being missed and can be reduced by effective provider recommendations for HPV vaccination and by administering all recommended vaccines during the same visit.

11:40 Long-Term Rotavirus Vaccine Effectiveness Against Emergency Department Visits and Hospitalizations Among Children Seeking Care for Acute Gastroenteritis at New Vaccine Surveillance Network Sites — United States, 2009–2022

Authors: Alpha Oumar Diallo, I. Sulemana, M.E. Wikswo, M.A. Staat, J.A. Boom, R. Selvarangan, N. Halasa, J.V. Williams, E.J. Klein, G.A. Weinberg, A. Curns, R. Gautam, U.D. Parashar, S.A. Mirza, J.E. Tate, on behalf of the New Vaccine Surveillance Network

Background: Rotavirus was the leading cause of acute gastroenteritis (AGE) among US children aged <5 years until rotavirus vaccine introduction in 2006, after which rotavirus-associated emergency department (ED) visits and hospitalizations decreased from ~40% (2006–2007) to ~9% (2008–2016) of AGE encounters. We evaluated rotavirus vaccine effectiveness (VE) to characterize long-term vaccine performance.

Methods: We analyzed data from the population-based New Vaccine Surveillance Network using a test-negative, case-control design to estimate rotavirus VE against laboratory-confirmed rotavirus infections among children aged 8–59 months with AGE (≥3 diarrhea or ≥1 vomiting episodes within 24 hours) in the ED or hospital during 2009–2022. Case patients and control patients were children whose stool specimen tested rotavirus positive or negative, respectively, by enzyme immunoassay or polymerase chain reaction assays. VE was calculated as (1–adjusted odds ratio [OR]) × 100%. Adjusted ORs were calculated by multivariable logistic regression adjusted for month/year of birth, quarter/year of symptom onset, surveillance site, health insurance status, and race/ethnicity.

Results: Among 16,064 enrolled children aged 8–59 months, 1,722 (11%) tested positive for rotavirus (case patients) and 14,342 (89%) tested negative (control patients). Case patients were less often vaccinated against rotavirus than control patients (62% versus 88%). Overall, VE against rotavirus-associated hospitalization or ED visits was 77% (95% CI: 74%–80%) but fluctuated annually (range: 66%–92%). When stratified by a modified Vesikari Severity Score, VE was 59% (95% CI: 49%–67%), 80% (95% CI: 76%–83%), and 94% (95% CI: 90%–97%) against mild, moderate, and severe disease, respectively. Rotavirus vaccines conferred high protection against common circulating genotypes (G1P[8], G2P[4], G3P[8], G9P[8], and G12[P8]). VE was higher during the first three years of life (71%–88%); subsequently, protection decreased as age increased.

Conclusions: This mpox outbreak, associated with a group sex event among predominantly fully vaccinated attendees, highlights need for safe sex practices and vigilance for symptoms of mpox regardless of vaccination status after similar exposure. Examination of time elapsed between vaccination and diagnosis of mpox is needed to establish potential waning immunity after vaccination.

12:00 Risk Factors Associated With Pediatric Acute Gastroenteritis Mortality Globally — 2007–2022

Authors: Mary C. Moran, E. Burnett, U. Parashar, J. Tate, on behalf of the Rotavirus Vaccine Effectiveness Against Rare Outcomes Study Group

Background: Rotavirus is a leading cause of pediatric acute gastroenteritis (AGE) mortality globally. While rotavirus vaccines have reduced rotavirus disease burden, AGE remains an important cause of mortality in children <5 years of age, and risk factors of AGE mortality are incompletely understood. To identify risk factors of all-cause AGE mortality, we pooled surveillance data from 14 low- and middle-income countries that conducted rotavirus vaccine effectiveness evaluations between 2007 and 2022.

Methods: All-cause AGE surveillance data from evaluations that recorded ≥1 AGE deaths were included in the analysis. Cases were defined as children <5 years seeking medical treatment at a sentinel surveillance hospital for AGE (≥3 episodes of acute, watery diarrhea in 24 hours lasting ≤7 days) who died. Controls met the same criteria but were discharged home. To identify risk factors of AGE mortality, unconditional logistic regression was used to calculate the odds of death among cases and controls.

Results: The analysis included 195 children with AGE who died (cases), and 22,609 children discharged home (controls). Cases were slightly younger (9.2 vs 10.5 months), had longer hospital stays (5.3 vs 3.5 days), were admitted later after symptom onset (3.8 vs 2.5 days), and were less likely to be rotavirus positive than controls (13.9% vs 26.6%). Factors that increased the odds of AGE mortality were having received no routine vaccines (OR: 10.3; 95% CI: 5.3–19.8), chronic malnourishment (OR: 2.0; 95% CI: 1.3–2.9), being underweight (OR: 5.8; 95% CI: 3.8–8.7), and not having electricity at home (OR: 2.9; 95% CI: 2.0–4.1). Unimproved water source was not a significant risk factor (OR: 1.3; 95% CI: 0.6–3.0).

Conclusions: Factors associated with access to health care and malnourishment were the greatest risk factors for AGE mortality in this analysis. Improving vaccination coverage and access to care are important measures to prevent pediatric diarrheal deaths.

CONCURRENT SESSION G1: Notes from the Field

3:40–5:05 pm

Moderators: Suzanne Beavers & Janet Hamilton

3:45 Mpox Among Group Sex Event Attendees — Seattle, Washington, 2023

4:05 Changes to STEC Surveillance During the COVID-19 Pandemic and its Impact on Public Health Investigations — New York City, January 2017–September 2022

Authors: John Croft, H.N. Waechter, J. Latash, L. Li, A.M. Fireteanu, A. Cintron, L. Chicaiza, S. Li, Y. Li, A. Olsen, V. Reddy

Background: Historically, the New York City Department of Health and Mental Hygiene (DOHMH) investigated all Shiga toxin-producing *Escherichia coli* (STEC) cases. DOHMH's COVID-19 response prompted resource reprioritization, and beginning October 2020, DOHMH only investigated high-priority STEC cases: culture-confirmed, all patients <5 years old or with known associations to high-risk transmission settings, and cluster/outbreak-associated. We assessed this change's impact on socio-demographics of investigated cases, cluster/outbreak investigations, exclusions, and investigation timeliness.

Methods: We analyzed reports before (Period 1: January 2017–February 2020) and after (Period 2: October 2020–September 2022) investigation changes. Risk ratios (RRs) and 95% confidence intervals (CIs) were calculated for patient-level (case status, investigation status, age, sex, county, zip code-level poverty, race/ethnicity, interview language, high-risk transmission setting exposure, exclusion status) and cluster-level factors (cluster-associated cases, solved clusters/outbreaks). Wilcoxon rank-sum tests were calculated to compare lags between case report and first interview attempt, interview completion, and exclusion.

Results: During Period 1 (n = 1,672) versus Period 2 (n = 1,103), a higher proportion of reports were assigned for investigation (1,672, 100% versus 441/1,103, 40%), and interviewed (1,403/1,672, 84% versus 335/441, 76%). Period 2-investigated patients were less likely to be female (RR: 0.71, CI: 0.59–0.86), ≥45 years old (45–64 [RR: 0.37, CI: 0.24–0.58] or ≥65 [RR: 0.46, CI: 0.31–0.71] versus 5–17 years old), and reside in Manhattan compared with the Bronx (RR: 1.61, CI: 1.21–2.13), Brooklyn (RR: 1.46, CI: 1.12–1.91), or Queens (RR: 1.32, CI: 1.01–1.73). No other differences were seen across both periods. Median days between case report and first interview attempt increased from Period 1 (3 days [interquartile range {IQR}: 1–5]) to Period 2 (7 [IQR: 2–14]) (P <.0001), as did days between case report and completed interview: 6 (IQR: 2–12) to 13 (IQR: 4–21 [P <.0001]). The proportion of Period 2-excluded patients (30/1,103, 3%) was less than Period 1 (111/1,672, 8%) (RR: 0.56, CI: 0.41–0.76), though median days from report to exclusion were similar (5, P = 0.76). Cluster-/outbreak-associated patients were less likely to be interviewed in Period 2 (RR: 0.52, CI: 0.29–0.94). Fewer clusters/outbreaks were resolved in Period 2 (1/22, 5%) versus Period 1 (6/36, 16%) (RR: 0.47, CI: 0.07–3.03).

Conclusions: Although reprioritizing STEC investigations reduced investigation burden, less success with patient and cluster/outbreak investigations and fewer exclusions contributed to decreases in STEC-related public health actions taken during Period 2. This evaluation has prompted a reassessment of future STEC surveillance activities at DOHMH.

4:25 Neurosyphilis, Ocular, and Otic Syphilis Cases — Chicago, Illinois, January–August 2023

Authors: Amy Nham, T. Holly, I. Tabidze

Background: Neurologic, ocular, and otic (NOO) manifestations can occur at any stage of syphilis and are debilitating. NOO syphilis is most common among persons living with HIV, particularly men who have sex with men (MSM). Recently, healthcare providers in Chicago have reported increased NOO syphilis among heterosexual persons without HIV. We characterized NOO syphilis cases stratified by HIV status to determine factors associated with diagnosis.

Methods: We queried Chicago's Health Information Management System to identify potential syphilis cases defined as cerebrospinal fluid tests (eg, VDRL [Venereal Disease Research Laboratory], protein, glucose) consistent with neurosyphilis, treatment with intravenous penicillin, or any documented syphilis sign or symptom in Chicago residents during January 1–August 24, 2023. We reviewed medical records to confirm cases using the 2018 CDC NOO syphilis case definitions. We matched cases using Enhanced HIV/AIDS Reporting System and compared differences by HIV status.

Results: We identified 36 potential cases, including 28 NOO syphilis cases. Twenty (71%) were neurosyphilis, 17 (61%) ocular syphilis, and 1 (4%) otic syphilis; 10 (36%) had >1 type. Twenty-one (75%) patients were male at birth, and 20 (71%) were non-Hispanic Black. Median age was 50 years (range: 23–82 years). Nine (32%) were HIV-positive. Six (21%) identified as MSM, 15 (54%) as heterosexual, and 7 (25%) had undocumented sexual preference. Nineteen (68%) lacked typical syphilis symptoms (eg, chancre or rash); 16 (57%) had decreased vision and 6 (21%) acute headaches. There were no significant differences stratified by HIV status, except persons without HIV identified as heterosexual more often (P = .008).

Conclusions: Majority of NOO syphilis cases were among persons without HIV. Signs or symptoms consistent with NOO syphilis (eg, decreased vision) were often the only presentation. Clinicians should consider NOO syphilis even in persons presenting without typical syphilis signs and symptoms and persons without HIV.

4:45 COVID-19 Outbreak at the Epidemic Intelligence Service Conference — Georgia, April–May 2023

Authors: Dylan A. Proctor, S. Hamid, K.C. Ma, E. Shearer, A. Feldpausch, L. Edison, P. Salvatore, O. Almendares, H.L. Kirking, E. Pevzner, C. Perrine

Background: CDC's annual Epidemic Intelligence Service (EIS) Conference was in Atlanta, Georgia, April 24–27, 2023. On April 27, multiple in-person attendees reported testing positive for SARS-CoV-2. We aimed to describe the extent of transmission among attendees and risk factors for infection.

Methods: On May 5, we emailed a survey to ~1,800 registered in-person conference attendees. Questions included demographic characteristics, masking behavior, conference activities, symptoms and onset date, SARS-CoV-2 testing, vaccination status, prior COVID-19 infections, and healthcare-seeking behavior. We defined a case as a self-reported positive SARS-CoV-2 test result in an attendee from conference start to 10 days post-conference. We calculated cumulative incidence among respondents and risk factors for infection using risk ratios with 95% CIs.

Results: Of 1,443 survey respondents (80% response rate), 181 (13%) met the case definition. An additional 205 (14%) reported COVID-like symptoms (eg, fever, cough, shortness of breath) but did not test or reported a negative test result. Approximately 99% (n = 1,435) of respondents reported receiving ≥1 COVID-19 vaccine dose, 547 (38%) reported no known prior SARS-CoV-2 infection, and 991 (69%) reported never wearing a mask during the conference. Among cases, 175 (97%) attendees were symptomatic, 49 (27%) received antiviral medications; no hospitalizations were reported. Risk for infection among attendees with no known prior infection was 1.7 times (95% CI: 1.3, 2.2) the risk for attendees who reported a prior infection. Risk for infection among persons attending ≥3 days was 1.7 times (95% CI: 1.2, 2.5) the risk among persons attending ≤2 days.

Conclusions: SARS-CoV-2 remains transmissible, especially in crowded settings, even when populations are highly vaccinated. Future conference organizers should remind participants to stay up to date with COVID-19 vaccinations and employ other risk reduction measures.

CONCURRENT SESSION G2: Social Determinants of Health

3:40–5:05 pm

Moderators: Lindsay Womack & Leandris Liburd

3:45 Differences in the Prevalence of Subjective Cognitive Decline by Social Determinants of Health and Health-Related Social Needs — 15 States, 2022

Authors: DaJuandra Y. Eugene, J. Omura, B. Olivari, G. Kilmer, R. Patel, L. McGuire

Background: Dementia is a critical public health issue with known health disparities. Social determinants of health (SDOH) and health-related social needs (HRSN) may influence differences across various health outcomes, including cognitive functioning. We describe the association between subjective cognitive decline (SCD), an early indicator of possible future dementia, and select adverse SDOH-HRSN.

Methods: We used 2022 data (n = 80,943) from 15 states that administered both the Cognitive Decline and Social Determinants and Health Equity modules in the Behavioral Risk Factor Surveillance System. Prevalence of SCD was estimated among adults aged ≥45 years by 6 adverse SDOH measures (ie, loss of employment, food stamp use, food insecurity, housing insecurity, inconsistent home utility, lack of transportation) and 3 HRSN measures (ie, lack of social-emotional support, social isolation, stress). Pairwise t-tests were used to identify significant differences (P <0.05).

Results: Overall, prevalence of SCD was 11.1% (95% CI: 10.4–11.8), and SCD was significantly higher among adults reporting each adverse SDOH-HRSN (eg, housing insecurity = 27.4%; 95% CI: 23.6–31.1 vs no housing insecurity = 9.5%; 95% CI: 8.8–10.1). For adverse SDOH, prevalence of SCD ranged from 32.6% (95% CI: 27.5–37.8) among those with lack of transportation to 19.3% (95% CI: 15.6–23.1) among those with loss of employment. For HRSN, prevalence of SCD ranged from 33.2% (95% CI: 29.7–36.7) among those with stress to 20.3% (95% CI: 18.2–22.4) among those with lack of social or emotional support.

Conclusions: In 2022, differences in the prevalence of SCD were identified between adults with and without each adverse SDOH-HRSN examined. Addressing these key drivers of inequities (eg, transportation), which may lead to barriers in accessing care and services, is essential to help reduce potential disparities in dementia and to support early detection and cognitive health.

4:05 Social Determinants of Health Disparities in Lung Cancer Survival — United States, 2010–2019

Authors: Christine M. Kava, D.A. Siegel, S. Dai, S.A. Sabatino, J. Qin, F.K. Tangka, S.J. Henley

Background: Lung cancer has low 5-year relative survival. Social determinants of health (SDOH) can influence cancer outcomes, but common data sources used to examine survival provide limited information on SDOH. Thus, we linked cancer registry data to county-level data on SDOH and health risk behaviors to examine disparities in lung cancer survival by patient- and county-level characteristics.

Methods: We linked 2010–2019 National Program of Cancer Registries survival data covering 75% of the US population to county-level data on current cigarette smoking prevalence, air pollution (ie, average daily particulate matter), and social vulnerability (ie, socioeconomic status, household composition, and disability, minority status and language, and housing type and transportation). We used the Kaplan-Meier method to generate survival curves and multivariable Cox proportional hazards regression to examine all-cause survival among patients aged ≥20 years diagnosed with lung cancer.

Results: Of 1,440,974 patients diagnosed with lung cancer during 2010–2019 (48% female; 52% male), Kaplan-Meier analysis showed that 22% achieved 5-year survival. Selected findings from the Cox regression analysis showed that patients who were male vs female (adjusted hazard ratio [aHR]: 1.23; 95% CI: 1.22–1.23), non-Hispanic American Indian or Alaska Native [AI/AN] vs non-Hispanic White (aHR: 1.04; 95% CI: 1.02–1.07), and residents of counties with higher cigarette smoking prevalence (aHR: 2.76; 95% CI: 2.58–2.96), higher air pollution (aHR: 1.01; 95% CI: 1.00–1.01), and in the highest vs lowest quartile for social vulnerability (aHR: 1.04; 95% CI: 1.04–1.05) had a significantly higher risk of death.

Conclusions: Our study examined SDOH associated with lung cancer survival. Male sex, AI/AN race, county-level cigarette smoking prevalence, air pollution, and social vulnerability were associated with reduced survival. Interventions that address SDOH and health risk behaviors (eg, smoking cessation treatment, reducing socioeconomic inequities) could improve outcomes for lung cancer.

4:25 Legionnaires' Disease Case Exposure Classification Differs by Race and Ethnicity and Neighborhood Health — California, 2011–2021

Authors: Cassandra O. Schember, S. Rutschmann, A. Kimura, A. Nguyen, D. Vugia, S. Jain

Background: Legionnaires' disease (LD) is a severe pneumonia caused by *Legionella* bacteria transmitted by inhalation of contaminated water droplets found in poorly maintained water systems. During 2012–2020, 53% of California LD patients were White, and 14% were Black; however, these groups account for 39% and 6% of the population, respectively. Healthy Places Index (HPI) measures neighborhood health with 23 indicators of social and environmental conditions. We assessed associations between race/ethnicity and neighborhood health with LD case exposure classifications to establish priorities for decreasing LD disparities in California.

Methods: Using all California LD cases reported during 2011–2021 and six, individual modified Poisson regression models, we estimated incidence rate ratios (IRRs) and 95% confidence intervals (CIs) for associations between race/ethnicity and neighborhood health with three LD case exposure classifications (sporadic, healthcare-associated, or travel-associated). The most advantaged HPI quartile and non-Hispanic White race/ethnicity were the referent groups. All models controlled for birth sex, age, and year.

Results: Among 4,373 people with LD, 47% were White, 22% were Hispanic, 12% were Black, and 22%–28% fell in each HPI quartile. Among cases, 78% were sporadic, 16% were travel-associated, and 5% were healthcare-associated. Black (IRR: 0.69; 95% CI: 0.55, 0.87) and Hispanic (IRR: 0.64; 95% CI: 0.52, 0.77) race/ethnicity were associated with decreased rates of travel-associated LD. Black (IRR: 1.06; 95% CI: 1.01, 1.11) and Hispanic (IRR: 1.11; 95% CI: 1.07, 1.16) race/ethnicity, and living in the least advantaged quartile (IRR: 1.05; 95% CI: 1.01, 1.10) were associated with increased rates of sporadic LD. Healthcare-associated LD was not associated with race/ethnicity or HPI.

Conclusions: We found evidence of racial and neighborhood disparities in LD case exposure classifications. Efforts to increase uptake of water management programs in buildings in disadvantaged neighborhoods and travel accommodations might lessen LD burden and disparities in California.

4:45 Sociodemographic Characteristics of Communities With Differing Strengths of Complete Streets Policies, 2019–2022

Authors: Farah Mouhanna, J. Nakayama, M. Van Dyke, G. Whitfield

Background: Complete Streets (CS) policies promote street design that improves accessibility, safety, and places for physical activity for people of all ages and abilities. CS policies vary in strength and have been scored using expert-identified elements, such as design guidance, prioritization of communities with lower incomes, and implementation accountability. We identify the characteristics of communities with differing strengths of policies to help efforts to improve equitable, high-quality CS policy adoption.

Methods: We used data from the 2017–2022 American Community Survey and Smart Growth America's *Best Complete Streets Policies 2023*, which scored policies adopted during 2019–2022. We focused on US Census incorporated places (n = 166) and county subdivisions (n = 64). Policies with lower and higher scores (n = 59 and n = 171, respectively) were classified by using 25th percentile as a cutoff. We used Wilcoxon rank tests to compare median values of sociodemographic characteristics between policy areas with low vs high scores.

Results: Compared to areas with higher scoring policies, areas with lower scoring policies had smaller population size (medians: 8,288 vs 16,826; P = .0014), lower household income ($64,332 vs $83,188; P = .0079), and higher percentage income to poverty ratio <1 (14.2% vs 7.7%; P = .0259). There were no significant differences in the percentage of population from racial and ethnic groups excluding non-Hispanic White group (18.1% vs 16.1%; P = .8126) nor age (40.5 vs 40.4; P = .6232).

Conclusions: Differences between communities with lower vs higher scoring CS policies were observed for population size and indicators of income. Small local jurisdictions and communities with lower incomes may require additional technical assistance (eg, expert coaching, peer-to-peer learning, model policy guides) when adopting CS policies. Strong policies in these communities may contribute to improved community design for physical activity, pedestrian safety, and health equity.

CONCURRENT SESSION 11: Vector-Borne Disease

9:00–10:45 am

Moderator: Marion Carter & Chris Braden

9:05 Locally Acquired Mosquito-Transmitted Malaria Investigations — U.S., May–October 2023

Authors: Erika Wallender, D. Blackburn, K. Saunders, T. DeVita, A. Morrison, D. Stanek, A. Bashadi, K. Broussard, L. Rothfeldt, K. Blount, M. Duwell, K. Mace, A. Sutcliffe, A. Lenhart, J. Barratt, B. Raphael, M. Parise, P. McElroy, A. Ridpath

Background: Locally acquired mosquito-transmitted (autochthonous) malaria was last reported in the US in 2003, though ~2,000 imported malaria cases are reported annually, and the *Anopheles* mosquito vector is widespread. CDC supported state and local partners in four US states to conduct epidemiologic and entomologic investigations to control autochthonous malaria during 2023.

Methods: Cases were defined as *Plasmodium* species identified by blood smear microscopy or polymerase chain reaction (PCR). Case investigations, including medical record review and patient interviews, determined autochthonous classification. The public health response included active case finding, mosquito surveillance and control, community outreach, and provider education. Strain-relatedness among cases was evaluated by targeted amplicon sequencing. Collected *Anopheles* mosquitoes were tested for *Plasmodium* species by PCR.

Results: Autochthonous malaria infection was identified in 10 persons without known malaria risk factors (international travel, intravenous drug use, blood transfusion, organ transplantation). Seven were male; median age was 40 years (range 15–64), and 3 were unhoused. All individuals reported evening outdoor activities within 1 month of symptom onset. Median time from symptom onset to hospitalization or treatment was 8.5 days (range 3–14 days). *Plasmodium vivax* was identified in Florida (7 individuals), Texas (1 individual), and Arkansas (1 individual). *Plasmodium falciparum* was identified in Maryland (1 individual). Sequencing of the *Plasmodium vivax* parasites indicated the same strain among all cases in Florida. Of 608 Anopheles mosquitos collected from Florida, 3 were PCR positive for *Plasmodium vivax;* mosquitoes from Maryland (16), Texas (129), and Arkansas (25) were PCR negative.

Conclusions: The first US autochthonous malaria cases in 20 years demonstrate a continued risk for malaria reintroduction. Case numbers were small, showing that timely identification, investigation, and response to autochthonous malaria cases can interrupt transmission. CDC can prepare for future outbreaks by developing clinical and public health tools to strengthen preparedness and response.

9:25 Powassan Virus and Eastern Equine Encephalitis Virus Seroprevalence in Endemic Areas — United States, 2019–2020

Authors: Hannah Padda, C.Y-H. Huang, K. Grimm, B.J. Biggerstaff, J.P. Ledermann, J. Raetz, K. Boroughs, E. Mossel, S. Martin, J. Lehman, R.L. Townsend, D. Krysztof, P. Saa, E.T.N. Dinh, M.G. Stobierski, B. Esponda-Morrison, K.A. Wolujewicz, M. Osborne, C.M. Brown, B. Hopkins, E.K. Schiffman, X. Lee, R.A. Osborn, R.J. Wozniak, A.C. Brault, S.B. Basavaraju, S.L. Stramer, J.E. Staples, C.V. Gould

Background: Powassan virus (POWV) and eastern equine encephalitis virus (EEEV), transmitted to humans by ticks and mosquitoes, respectively, are endemic to limited geographic areas. Both can cause severe neuroinvasive disease, sporadically or as outbreaks. Recently, probable POWV transmission through blood transfusion and EEEV transmission through organ transplantation were identified. We estimated seroprevalence of these viruses in endemic regions to assess potential risk to the blood supply and estimate infection burden.

Methods: We classified endemic counties for POWV and EEEV using predefined thresholds of disease cases reported to CDC during 2010–2019. From blood donations collected during December 2019–July 2020, we randomly selected residual samples from residents of endemic counties, excluding counties with ≤5 samples. We screened samples for POWV- or EEEV-specific neutralizing antibodies by plaque reduction neutralization test. We estimated population seroprevalence by calibrating sample weights to county population census data or calculated blood donor seroprevalence if cases were not considered locally acquired.

Results: For POWV, we included 1,764 samples from 13 counties in Connecticut, Massachusetts, Minnesota, and Wisconsin. Median county population seroprevalence was 0.69%, ranging from 0% (95% CI: 0–36.9%) to 18.6% (95% CI: 4.90–42.4%). The highest estimates (14.5–18.6%) were in two neighboring Wisconsin counties. In one Minnesota county without locally acquired cases, blood donor seroprevalence was 1.42% (95% CI: 0.39–5.02%). For EEEV, we included 567 samples from 10 counties in Connecticut, Massachusetts, and Michigan. Only one donor sample in Massachusetts had EEEV antibodies. County population seroprevalence ranged from 0% (95% CI: 0–19.5%) to 1.11% (95% CI: 0.02–6.54%).

Conclusions: Population seroprevalence estimates for POWV and EEEV in endemic areas were generally low, except for one focal area with relatively high POWV seroprevalence. However, small sample sizes limited precision. Focused testing in areas with increased seroprevalence could be considered to inform blood donor screening practices.

9:45 Increased Tularemia Incidence Linked to Reporting of Probable Cases — United States, 2011–2022

Authors: Shannan N. Rich, A. Hinckley, A. Earley, J. Petersen, P. Mead, K. Kugeler

Background: Tularemia is a nationally notifiable, potentially fatal zoonosis caused by *Francisella tularensis*. In 2017, a revised surveillance case definition expanded laboratory evidence to include detection by polymerase chain reaction as supportive criteria for probable cases. We examined surveillance data reported to CDC during 2011–2022 to update national incidence figures, comparing them to 2001–2010 data while considering the impact of the revised case definition.

Methods: We calculated annual incidence as cases per 100,000 population using 2005 census estimates for the previous period (2001–2010) and 2017 census estimates for the current period (2011–2022). Additionally, we assessed incidence before (2011–2016) and after (2017–2022) the case definition change within the current period. We performed univariate logistic regression to evaluate associations between patient demographics and case classification.

Results: During 2011–2022, a mean of 205 cases were reported annually, up from 121 in the previous period. The mean annual incidence was 0.064 (range: 0.047–0.098), a 56% increase over the previous period. Incidence peaked during 2015 when 123 cases were reported in four western states. Incidence of confirmed cases (0.026) was relatively unchanged from the previous period (0.025); however, probable incidence (0.038) was 2.7 times that of the previous period. Incidence of probable cases increased from 0.033 before to 0.044 after the case definition change. Probable case status was associated with younger age and Native American race.

Conclusions: Incidence of reported tularemia was greater during 2011–2022 than in the previous period. This increase was driven by greater reporting of probable cases, partly due to the revised case definition. These shifting surveillance patterns might not reflect an increase in tularemia risk; rather, they could be linked to differences in healthcare access among specific groups or changes in laboratory practices.

10:05 Chagas Disease Burden in a Border County — San Diego County, 2018–2023

Authors: Audrey E. Kennar, M. Villalobos, M.E. Beatty, R. Chinn, P. Stigler Granados, S. Stous, J. Nelson, A. Kao, J. Corrigan, S. Shah

Background: Chagas disease, caused by the parasite *Trypanosoma cruzi*, is a major cause of cardiovascular and gastrointestinal morbidity and mortality in Latin America. San Diego County (SDC) is on the United States-Mexico border, increasing the risk for Chagas disease importation from Latin America. Because Chagas disease is not reportable, the SDC-wide burden is unknown. To determine scope of Chagas disease burden and whether Chagas disease should be reportable, the County of San Diego Health and Human Services Agency (CoSD HHSA) quantified and characterized Chagas disease cases in SDC from multiple sources.

Methods: We identified any positive Chagas disease test result during 2018–2023 and obtained demographic and epidemiologic information from the following sources: voluntary case reporting to Web Confidential Morbidity Report (WebCMR), SDC's disease registry; patient chart review of *International Classification of Diseases, Tenth Revision* codes B57–B57.5 for acute and chronic Chagas disease from 3 healthcare systems; and routine bloodborne pathogen screening from blood banks and cardiac transplant centers. Suspect cases, defined as having an initial positive test result, were further classified as confirmed (positive CDC confirmatory test), probable (initial positive test and epidemiologic evidence), and not a case (negative CDC confirmatory test).

Results: We identified 99 suspect cases from local blood banks (78%), healthcare systems (15%), WebCMR (6%), and cardiac transplant centers (1%). Among these, 59% were in SDC residents, 35% were in nonresidents, and 6% lacked residence information. Among suspect cases, 10 (10%) cases were classified as confirmed, 13 (13%) were probable, and 49 (50%) were not a case.

Conclusions: Despite not being locally reportable, examination of multiple data sources identified presence of Chagas disease in SDC. Given SDC's border location and presence of Chagas disease, CoSD HHSA plans to make Chagas disease locally reportable to identify cases and monitor any disease-associated morbidity and mortality more closely.

CONCURRENT SESSION I2: Injury and Overdose Prevention

9:00–10:45 am

Moderators: Shane Jack & Allison Arwady

9:05 Characterizing Intent of Firearm Injuries by Number of Bullet Wounds, National Violent Death Reporting System — 49 States, the District of Columbia, and Puerto Rico, 2003–2021

Authors: Saskia R. Vos, K.A. Fowler, J.M. Blair, D.A. Bowen, S.A. Sumner

Background: A complex and ongoing issue in firearm violence prevention research is correctly classifying injury intent (ie, homicide, suicide, or unintentional). Research suggests that a substantial number of non-fatal firearm injuries in clinical settings are misclassified as unintentional injuries when they are more likely firearm assaults. This misclassification occurs as International Classification of Diseases coding guidelines recommend classifying unknown or unspecified injuries as accidental. Emerging rule-based approaches to improve classification use the number of bullet wounds to infer intent of the injury when additional information is not available. Using CDC's National Violent Death Reporting System (NVDRS), which captures detailed information on intent of firearm injuries from coroner/medical examiner and law enforcement reports, we examine potential evidence to support intent determination based on the number of bullet wounds.

Methods: We analyzed 2003–2021 NVDRS data on decedents of fatal firearm injuries (N = 299,362). We examined differences in the average number of bullet wounds by intent (manner) of death (Suicide, n = 175,921; Homicide, n = 110,959; Unintentional Injury, n = 3,904). We used ANOVA to test statistical significance of differences in average number of bullet wounds by intent and then used Tukey's Honest Significant Difference Test to determine specific differences by intent.

Results: The average number of bullet wounds significantly differed by intent: suicide, 1.02; homicide, 2.72; and unintentional injury, 1.01 (P<.001). Homicide decedents had a higher number of wounds on average than unintentional injury decedents and suicide decedents (mean difference between homicide and unintentional injury [1.71; 95% CI: 1.62–1.79; P <.001] and mean difference between homicide and suicide [1.7; 95% CI: 1.68–1.72; P <.001]).

Conclusions: The number of bullet wounds may be a useful indicator for classifying intent of firearm injuries, particularly when other supporting information is not available for medical coding. Accurate counts of firearm injuries by intent are critical for public health surveillance and prevention planning.

9:25 Characterizing Kentucky's Syringe Services Programs — 2018–2022

Authors: Oshea Johnson, J. Duncan, C. Barnes, E. Dhakal, G. Robinson, D. Thoroughman

Background: Kentucky has the country's third-highest drug overdose death rate, with the highest burden occurring in rural counties in Appalachia. Additionally, Kentucky has 54 of 220 US counties noted by CDC as most vulnerable to HIV and hepatitis C virus (HCV) outbreaks. Syringe services programs (SSPs) help prevent overdose deaths, decrease infectious disease transmission, and reduce drug use among people who inject drugs (PWID). Kentucky legalized SSPs in 2015 to connect PWID with health-promoting services and resources. We characterize increases in services provided by SSPs throughout Kentucky during 2018–2022.

Methods: Data regarding total clients, visits, syringes distributed and returned, naloxone kits distributed, and administration of HIV and hepatitis C virus (HCV) tests were collected from clients during each visit and entered into a REDCap database. Data collected during 2018–2022 were aggregated at the state level for analysis.

Results: In 2018, a total of 27 SSPs operated in Kentucky, serving 11,749 unique clients and receiving 22,347 visits; 7 SSPs operated in urban counties and 20 in rural counties. By 2022, there were 56 SSPs (107.4% increase), 26,430 unique clients (125% increase), and 108,191 visits (384% increase); 16 SSPs operated in urban counties (128.8% increase), whereas 40 operated in rural counties (100% increase). By 2022, 34 (63%) SSPs operated within 54 Kentucky counties vulnerable to HIV and HCV outbreaks. Statewide syringe return rate increased by 10.7% from 2018 (73.8%) to 2022 (84.5%), and naloxone kit distribution increased 1,455.5% during these 5 years (2,758 kits vs 42,901 kits). The number of HIV tests administered increased 446.1%, and HCV tests increased 53.2%.

Conclusions: The number of SSPs operating in Kentucky approximately doubled during 2018–2022, providing more access to care and increased resources for PWID. SSPs were implemented in approximately two-thirds of Kentucky counties vulnerable to HIV and HCV outbreaks.

9:45 Spatial Analysis of Social Vulnerability and Firearm Injuries in King County, Washington, 2019–2023

Authors: Precious Esie, J. Liu, M. Ta, K. Brownson, A.J. Pallickaparambil

Background: In the US, firearm injuries cluster geographically, often in low-income communities and communities of color. To assess the value of a composite measure to describe spatial disparities, we conducted an ecological analysis examining the association between CDC's Social Vulnerability Index (SVI [ie, a percentile rank-based composite measure of social vulnerability]) and firearm injuries in King County, Washington.

Methods: We used health reporting areas (HRAs) as the spatial unit of analysis (n = 61), which generally correspond to neighborhoods or unincorporated areas of King County. HRA-level counts of firearm injuries, which include both fatal and non-fatal injuries of all intents combined (eg, homicide, suicide, assault, unintentional), were based on King County Emergency Medical Services (EMS) responses during January 2019–June 2023. SVI was categorized into tertiles (low, moderate, and high). Bivariate choropleth maps between SVI and firearm injuries illustrated spatial associations. We quantified the magnitude of the association between SVI and rates (per 10,000 population) of firearm injuries using Bayesian spatial negative binomial regression.

Results: In bivariate choropleth maps, areas of high and low rates of firearm injuries were colocated with areas of high and low levels of SVI, respectively. In spatial models, HRAs categorized as high vulnerability had rates of firearm injuries approximately 3 times higher than HRAs categorized as low vulnerability (incidence rate ratio [IRR] = 2.96; 95% credible interval [95% CrI]: 1.98, 4.42). Rates were also higher in HRAs categorized as moderate vulnerability (IRR = 1.64; 95% CrI = 1.17, 2.31).

Conclusions: In King County, areas with high social vulnerability had higher rates of EMS responses to firearm injuries. SVI can help identify geographic areas for intervention and provide a framework toward better understanding which upstream factors might contribute to spatial disparities.

10:05 Nonfatal Injuries Among Skilled Nursing and Residential Care Facility Workers Treated in U.S. Emergency Departments — 2015–2021

Authors: Nadia T. Saif, A. Reichard, V. Parasram, C. Socias-Morales

Background: Skilled nursing and residential care facility (SNRCF) workers provide transitional and long-term nursing, custodial, and rehabilitative care to residents. They face various workplace hazards which pose injury risks, including physically demanding care activities. These workers experienced significant strain during the COVID-19 pandemic. Employer-reported injury rates are higher for SNRCFs than for the healthcare and social assistance industry overall. Comprehensive national injury estimates are needed.

Methods: Data were analyzed (2015–2021) from nonfatal emergency department (ED)-treated occupational injuries in the National Electronic Injury Surveillance System, Occupational Supplement (NEISS-Work), a national probability sample of approximately 67 US EDs. Worker injuries in SNRCFs were selected based on relevant US Census Bureau industry codes. National injury estimates and injury rates per 10,000 full-time equivalents (FTEs) were calculated for workers from these sub-industries using the US Census Bureau Current Population Survey.

Results: An estimated 518,600 injuries (95% confidence interval ± 136,900) occurred from 2015 to 2021, a rate of 307 (± 81) injuries per 10,000 FTEs. Injury rates declined during this period. Most injuries occurred among women (80%; 414,700 ± 107,400) and workers aged 25–44 years (46%; 238,400 ± 63,100). The most prevalent injury events were overexertion and bodily reaction (38%; 197,300 ± 52,500), violence by persons (25%; 128,100 ± 49,300), and falls, slips, and trips (16%; 81,700 ± 23,500). Injuries to the trunk (29%; 147,600 ± 38,500) and upper extremities (26%; 134,200 ± 38,600) were most common.

Conclusions: Although estimates of ED-treated injuries among SNRCF workers have declined since 2015, most injuries were among women and involved a high proportion of workplace violence. It will be crucial for focused research to investigate contributing factors and determine if these trends continue post-pandemic. Additionally, improving uptake of interventions addressing the most frequent injury events, including overexertion and workplace violence, is key.

SESSION J: J.Virgil Peavy Memorial Award Finalists

10:55 am–12:20 pm

Moderators: Byron Robinson & Andrea Young

11:00 Use of Bayesian Statistics and Artificial Intelligence to Develop an Algorithm for Asyndromic Anomaly Detection in Emergency Department Visit Records — New Jersey, December 2020–August 2022

Authors: Anna Bratcher, E. Price, M. Sheppard, A. Kite-Powell

Background: The National Syndromic Surveillance Program (NSSP) monitors US Emergency Department (ED) visit records for outbreaks through use of syndromes — or pre-defined queries of symptoms and diagnoses. To expand NSSP functionality within New Jersey, we developed an algorithm to detect outbreaks within ED visit records without requiring pre-defined syndromes.

Methods: An asyndromic anomaly detection algorithm was developed using NSSP data on chief complaint (CC) records from New Jersey ED visits during December 2020–August 2022. A Bayesian analysis calculated weighted log-odds (WLOs) for symptom-based terms in the CC field for (1) a period of interest surveilled for outbreaks and (2) the preceding year as a baseline. For both periods, ten terms with the highest WLOs (without negating terms), indicating the most distinctive terms for that period, were identified. A word embedding artificial intelligence analysis then identified terms commonly used with the terms identified by the WLO comparison. The developed algorithm's outbreak detection ability was evaluated for a three-month period of interest following the 2022 mpox and 2021 SARS-CoV-2 Omicron variant emergence.

Results: The WLO analyses indicated "rash" and "monkeypox" as important terms during the three months following mpox emergence, with no similar terms indicated prior to emergence. "Smell taste" was an important word pairing prior to Omicron emergence but not following; "sore throat" was the most important pairing following Omicron emergence. Artificial intelligence analysis indicated "monkey" had the highest increase in usage with "rash" after mpox emergence compared with before. Meanwhile, "otalgia" had the highest increase in association with "cough" from before to after Omicron emergence.

Conclusions: This algorithm returned findings indicative of 2 known outbreaks, demonstrating the potential of asyndromic anomaly detection using NSSP within New Jersey. Given the threat of novel disease emergence and bioterrorism methods, routine use of this tool may help to supplement syndromic surveillance.

11:20 The Covariate Adjusted Logit Model: A Novel Statistical Method for Generating Immunologic Protection Thresholds and an Application to a Group B *Streptococcus* Case-Control Study — United States, 2010–2022

Authors: Rebecca Kahn, N. Shang, J. Rhodes, S. Schrag

Background: Maternal vaccines to protect infants against invasive group B *Streptococcus* (GBS), a leading cause of infant morbidity and mortality, are in development. For feasibility, they will be licensed based on immunologic thresholds from observational data capturing the relationship between anti-GBS antibody concentration and infant disease risk. Regulators require covariate-adjusted thresholds for licensure since such studies are not randomized. Methods to accurately adjust thresholds for covariates had not been developed.

Methods: We extended the scaled logit model to develop the Covariate Adjusted Logit Model (CALM), a novel method that allows for covariate adjustment of dose-response curves, such as GBS antibody-disease risk curves and associated immunologic thresholds. Using simulations, we assessed CALM's ability to generate accurate curves and thresholds and their predicted vaccine effectiveness (VE). We then applied CALM to a case-control study from 8 US states from 2010–2022 designed to provide US immunologic threshold estimates. We used the Akaike information criterion (AIC) to determine whether potential confounders (gestational age at delivery, maternal chorioamnionitis) and regulator-requested variables (geographic location, birth year, exposure to intrapartum antibiotics) should be included as covariates.

Results: In simulations with a proxy variable for confounders (associated with antibody concentration and disease) and a target VE of 75%, CALM accurately predicts VE (median of 1000 simulations: 75% (95% confidence interval: 67%–83%). In interim analyses of 378 cases and 734 controls, discussed with the Food and Drug Administration in September 2023, thresholds for 75% reduction in disease risk varied by serotype and age of disease onset (range 0.01–7.89 micrograms/milliliter). Based on the AIC, all five covariates were significant for inclusion.

Conclusions: CALM provides a method that adjusts for confounders. CALM-applied results have already proven pivotal for regulatory decision-making for maternal GBS vaccines. CALM can also be applied to other settings where covariate-adjusted dose-response curves are needed.

11:40 Small Area Estimation of Subdistrict Diabetes Prevalence — U.S. Virgin Islands, 2021–2022

Authors: Katie Labgold, J. Orr, J. Roth, E. Ellis

Background: Diabetes is a leading cause of severe morbidity in the U.S. Virgin Islands (USVI). USVI obtains territory- and island-level diabetes prevalence estimates from the Behavioral Risk Factor Surveillance System (BRFSS). These estimates provide overall understanding of diabetes burden but fail to capture within-island variations, which can facilitate public health decision-making. We estimated subdistrict-level diabetes prevalence using small-area estimation to prioritize communities for public health interventions.

Methods: USVI has 3 island-level jurisdictions with 20 subdistricts. We estimated subdistrict-level diabetes prevalence in 2 stages. In stage 1, we estimated individual-level probability of diabetes using a multilevel prediction model applied to 2020 U.S. Census Bureau decennial census subdistrict-level population characteristics. Parameter estimates for this model were obtained from multilevel logistic regression of 2021–2022 BRFSS data with individual- and island-level fixed effects and island-level random effect. In stage 2, we used poststratification to produce model-based subdistrict-level diabetes prevalence estimates by summing stage 1 individual-level expected probabilities overpopulation characteristic groups weighted by subdistrict population. We compared model fit by examining prevalence estimate differences (territory-level direct BRFSS survey and model-based) and the mean square error (MSE) of island-level estimates. We described variation in subdistrict-level diabetes prevalence using quantiles of diabetes prevalence and choropleth maps.

Results: High concordance was reported between USVI direct BRFSS survey and model-based diabetes prevalence estimates (15% vs 16%) and low MSE (0.7), indicating acceptable model fit. Within-island heterogeneity in model-estimated prevalence was reported: St. Croix prevalence 14% (subdistrict range 5%–22%), St Thomas (including Water Island) prevalence 17% (subdistrict range 3%–30%), and St John prevalence 8% (subdistrict range 3%–11%). Highest model-estimated prevalence were for West End (30%) and Tutu (25%) on St Thomas and Anna's Hope Village (22%) on St Croix.

Conclusions: Small-area estimation was a valuable tool for prioritizing USVI subdistricts for diabetes public health interventions.

12:00 Latent Class Analysis Identifies Clusters of Clinical Presentation and Severity Among Children With Multisystem Inflammatory Syndrome — United States, February 2020–December 2022

Authors: Kevin C. Ma, A.R. Yousaf, K.N. Lindsey, M. Melgar, A.D. Miller, A.B. Shah, M.J. Wu, A.P. Campbell, L.D. Zambrano

Background: Multisystem inflammatory syndrome in children (MIS-C) is an uncommon but severe hyperinflammatory illness occurring 2–6 weeks after SARS-CoV-2 infection. Presentation varies and overlaps with other conditions, including acute COVID-19, making diagnosis challenging. Identifying patterns of MIS-C presentation could inform efforts to reduce misclassification, categorize clinical phenotypes, and characterize patients at risk for severe outcomes. We describe MIS-C phenotypic clusters inferred using latent class analysis (LCA) on reported US cases.

Methods: We analyzed 9,333 MIS-C cases reported to CDC national surveillance February 2020–December 2022 from 55 jurisdictions. Twenty-nine clinical signs and symptoms were selected for clustering after excluding variables with ≥20% missingness and ≤10% or ≥90% prevalence. We excluded 389 cases missing ≥10 variables and conducted multiple imputation on the remaining 8,944 cases. LCA was run using the *poLCA* R package, with the number of clusters selected after considering model fit, cluster distinctiveness, and clinical interpretability.

Results: LCA identified three clusters, characterized by: 1) frequent respiratory findings primarily affecting older children (n = 713; 8.0% of all cases; median age: 12.7 years); 2) frequent shock (n = 3,359; 37.6%; 10.8 years); and 3) remaining undifferentiated cases (n = 4,872; 54.5%; 6.8 years). Mean hospitalization durations, ICU admission percentages, and case fatality percentages were highest in the respiratory-predominant (7.9 days; 49.5%; 4.6%; respectively) and shock-predominant clusters (8.7 days; 82.3%; 1.0%; respectively) compared with undifferentiated cases (5.3 days; 33.0%; 0.06%; respectively); P <.001 for all comparisons. The proportion of cases in the respiratory- and shock-predominant clusters decreased after the Omicron variant reached >50% prevalence in the United States (P <.001).

Conclusions: MIS-C cases clustered into subgroups with distinct clinical phenotypes, illness severity, and distribution over time. Use of clusters in future studies may support surveillance and case classification efforts, including identification of patients at highest risk for severe outcomes.

CONCURRENT SESSION K1: Zoonoses

1:20–2:45 pm

Moderators: Jennifer Wright & Fernando Torres-Velez

1:25 Human Case of Leptospirosis During a Canine Outbreak — Wyoming, 2023

Authors: Brittney N. Waranius, C. Tillman, C. Van Houten, A. Harrist, R. Digianantonio, H. Hasel, E. Curren

Background: Leptospirosis, a bacterial zoonotic disease, can cause severe illness and death. Although primarily reported in temperate and tropical regions, animal industry workers in any climate can be exposed. Canine leptospirosis is not reportable in Wyoming; however, 13 cases were reported to the State Veterinarian during August–October 2023. The Wyoming Department of Health (WDH) was notified of a human case in August, the first reported since 1983. We investigated to determine potential sources of infection, identify additional human and canine cases, and recommend control measures.

Methods: WDH reviewed medical records, interviewed the patient, and reviewed reportable conditions data. The State Veterinarian's Office obtained animal histories, reviewed veterinary records, and interviewed staff in facilities visited by ill dogs.

Results: The patient developed symptoms consistent with leptospirosis, was hospitalized twice, but not tested until the eighth day of illness; IgM antibodies to *Leptospira sp* were detected. No known contact with a canine case was reported, but the individual was occupationally exposed to dogs in the same city as the outbreak and fell ill the day that initial canine cases were identified. Three dogs met confirmatory criteria, and 10 met supportive criteria for diagnosis per American College of Veterinary Internal Medicine (ACVIM) testing guidelines. None of the dogs were vaccinated for leptospirosis. Six canine cases were linked to a boarding facility, but no common exposure was identified for all cases. No additional human cases were reported, and no occupationally exposed workers disclosed illness.

Conclusions: Leptospirosis can occur in regions with low disease risk. Healthcare providers should consider leptospirosis for persons with potential occupational exposure, even in low-risk areas. The 2023 ACVIM guidelines recommend that all dogs should be vaccinated regardless of lifestyle or geographic location. Wyoming is considering making canine leptospirosis reportable, which can help identify future outbreaks and prevent zoonotic spillover.

1:45 Multidisciplinary Approach to Investigating *Brucella canis* Exposures — South Carolina, September 2023

Authors: Tori Moore, A. Lancaster, J. Nelson, J. Sanders, M. Johnson, A. Moore, M. Tori

Background: *Brucella canis* is a rarely diagnosed zoonotic organism that causes Brucellosis in domestic dogs. Persons and animals can become infected through contact with contaminated canine bodily fluids and aborted materials. Symptoms can include fever, joint pain, and fatigue; illness can be debilitating, with some persons experiencing endocarditis or neurological symptoms. No serological tests for *B. canis* are approved for human diagnosis. South Carolina's Department of Health was notified of a family exposed to a stray, parturient dog that received a preliminary diagnosis of *B. canis*. We investigated to confirm the diagnosis, determine additional exposures, and guide treatment decisions.

Methods: South Carolina's Public Health Laboratory performed confirmatory testing on samples from the stray dog using polymerase chain reaction (PCR) and culture. Exposed animals were screened by indirect fluorescent antibody for *B. canis*. We interviewed the family and veterinary staff to evaluate animal and human exposure risk.

Results: Testing confirmed the stray dog was positive for *B. canis* on PCR and culture; the dog was euthanized because of risk for zoonotic transmission and poor prognosis. Two household dogs tested negative but will be monitored for symptoms for 24 weeks because *B. canis* has a variable incubation period. Three family members had high-risk exposure because they directly handled aborted materials and dead puppies. The three family members received antibiotic postexposure prophylaxis (PEP) and will be monitored for symptoms for 24 weeks; monitoring is ongoing. All other exposed persons and animals had low-risk exposures, and additional follow-up was not required.

Conclusions: This investigation confirmed *B. canis* exposure among humans and dogs and required a multidisciplinary approach to evaluate risk, direct animal testing, and human treatment. Lack of approved serological testing for humans made the investigation challenging; we relied on symptom monitoring and conservative administration of antibiotic PEP for persons with high-risk exposures.

2:05 In Search of Cryptic Bat Rabies Virus in Puerto Rico — A Novel Surveillance Approach

Authors: Andrew J. Beron, J.J. De Jesus Oquendo, M. Maldonado Cedeño, L. Orciari, C. Gigante, M. Marzan Rodriguez, S. Luna Anavitate, R. Wallace

Background: Puerto Rico is considered free of bat-mediated rabies. However, Puerto Rico has a favorable ecosystem to support bat-mediated rabies. A recent rabies serological study among bats found rabies-specific antibodies, suggesting cryptic transmission on the island. The Puerto Rico Department of Health (PRDOH) tests one bat per year (0.05 per 100,000 human population), far less than the continental United States (7.62 per 100,000). Serological evidence may suggest rabies virus in bats, but confirming enzootic presence requires detection of the virus, which can be achieved through a combination of surveillance methods. PRDOH and CDC collaborated to improve Puerto Rico's wildlife surveillance capacity for detecting bat-mediated rabies through enhancing laboratory testing capacity and implementing an active surveillance approach utilizing civil society organizations likely to encounter sick-acting and found-dead bats.

Methods: PRDOH and CDC identified 15 civil society organizations that represented spelunkers, pest exclusion workers, academic research groups, speleologist society members, and conservation groups to discuss the collection and submission of bats during routine activities. Based on the expected percent-positivity, a sample size of at least 175 bats per year would need to be tested to determine presence or absence of bat-mediated rabies. Surveillance data was monitored from September 2022 to September 2023.

Results: During this first phase of active surveillance, 13 bats of 4 different species were submitted to PRDOH; all negative. This represents a 13-fold increase in bat submissions compared to the previous 4 years.

Conclusions: Over a 13-month period of civil-society organization-based surveillance, only 10% of the needed bat samples were submitted for testing. While testing goals were not met, this approach dramatically increased the submission of suspected rabid bats to the PRDOH, suggesting this proof-of-concept surveillance approach can increase the bat testing rate. However, to understand if bat-mediated rabies is present, additional effort and engagement is needed.

2:25 Using a One Health Approach to Investigate an Outbreak of *Streptococcus equi zooepidemicus* Among Shelter Dogs in Pima County, Arizona — January 9–February 21, 2023

Authors: Cedar Mitchell, H. Yaglom, K. Cooper, A.L. Francisco, H. Centner, K. Pogreba-Brown, M. Dangler, P. Rivadeneira, D. Engelthaler, T. Cullen, K. Ellingson, J. Wilcox

Background: Transmission of *Streptococcus equi zooepidemicus* from dogs to humans can occur and be fatal. Pima County Health Department was notified of *S. zooepidemicus* infection in 4 ill shelter dogs on January 12. Infected dogs were isolated, but possible transmission to other dogs, the environment, and workers was unknown. We investigated cases among dogs, shelter cleaning, infection control protocols, and exposure risk for workers to mitigate transmission.

Methods: Confirmed cases of *S. zooepidemicus* were defined by polymerase chain reaction (PCR). To detect additional cases, we collected eye and throat swabs on January 12 from 250 shelter dogs with stays that overlapped with infected dogs. We reviewed dog admission and medical records for location-based exposures and demographics. On January 18, we collected environmental samples from potentially exposed shelter locations. We surveyed workers on February 21 to assess exposures and adherence to infection control protocols.

Results: We detected 4 additional dog cases; 3 exhibited mild symptoms, 1 was asymptomatic. Among 8 infected dogs, median stay was 14 days. Five were treated at the shelter clinic before symptom onset; 2 were anesthetized. Of 5 (62%) dogs with additional respiratory disease testing, 4 (80%) had ≥1 other respiratory pathogens. Of 15 environmental samples collected, 7 were PCR-positive for *S. zooepidemicus*; 6 of 7 positive samples were from 1 building that housed 5 ill dogs, and 1 involved clinic anesthesia equipment. Of 80 workers surveyed, 10 reported exposures to ill dogs; infrequent handwashing (≤50% of the time) was reported by 38% (21/56) of workers after dog contact and by 62% (32/52) when moving between shelter buildings.

Conclusions: We confirmed an outbreak of *S. zooepidemicus* among sheltered dogs and environmental contamination; no human cases were identified. We recommended cohorting dogs by kennel building, frequent environmental cleaning and handwashing, and adding in-line HEPA filters to anesthesia equipment.

CONCURRENT SESSION K2: Vaccine-Preventable Diseases

1:20–2:45 pm

Moderators: Julia Gargano & Demetre Daskalakis

1:25 Varicella Outbreak Among Asylum Seekers in New York City — 2022–2023

Authors: Leah D. Seifu, O. Matalka, R. Arciuolo, K. Graham, B. Isaac, J. Croft, A. Jean, N. Majid, M. Macaraig, E. Silverman, F. Laraque, A. Bouscaren, G. Caceres, B. Crouch, J. Rosen

Background: During October 2022, the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) identified a cluster of varicella cases among asylum seekers, primarily from Central and South America, residing in shelters. Varicella is a highly contagious viral disease; although it often causes mild-to-moderate symptoms, certain groups can experience serious illness. DOHMH investigated this outbreak to determine sources of viral transmission and guide varicella prevention and control efforts.

Methods: Suspected varicella cases were reported to DOHMH by healthcare facilities, schools, and residential facilities. An outbreak-associated case was defined as a clinically compatible rash and either provider diagnosis of or known exposure to varicella in a person who recently migrated from Central or South America or had an epidemiologic link to someone who did. DOHMH reviewed medical records and interviewed patients to ascertain settings attended during incubation and infectious periods and susceptible contacts. This information guided infection control measures and vaccination operations.

Results: As of July 28, 2023, DOHMH identified 629 outbreak-associated varicella cases linked to 79 residential facilities and 95 schools. The most recent illness onset date was July 24, 2023. Infection was acquired either prior to NYC arrival (108 cases; 17%), in residential facilities (272; 43%), from household contacts (97; 15%), or at school (9; 1%). The median age of patients was 10 years (range: 1 month–63 years), and 623 (99%) had no varicella vaccine documentation. Twenty-two patients (3%) required hospitalization due to varicella; none died.

Conclusions: NYC's varicella outbreak was driven by importation and transmission at residential facilities. Nearly all cases occurred among patients without documented vaccination, highlighting the importance of achieving high varicella vaccination coverage among asylum seekers from Central and South America. Varicella vaccination at the US border or on entry into NYC might limit varicella importation and subsequent transmission in residential facilities.

1:45 Effectiveness of the 2022–2023 Influenza Vaccine Against Influenza Infection and Illness

Authors: Elizabeth B. White, L. Grant, J. Burgess, K. Ellingson, M. Gaglani, K. Lutrick, A.C. Martinez, J. Meece, A. Naleway, G. Newes-Adeyi, L. Olsho, H. Tyner, S.K. Yoon, J. Mak, A. Britton, A. Fowlkes, B. Flannery

Background: Annual influenza vaccination is recommended for all US persons aged ≥6 months to prevent influenza illness and severe disease. Vaccine effectiveness (VE) against asymptomatic influenza infection is unknown. We estimated 2022–2023 influenza VE against symptomatic and asymptomatic infection to guide recommendations for reducing seasonal influenza transmission.

Methods: Data are from the HEROES-RECOVER prospective cohort, comprising adults at high occupational risk of influenza exposure across 7 US sites. Participants provided weekly symptom reports and nasal swabs for RT-PCR influenza testing. Laboratory-confirmed influenza infections were defined as symptomatic if ≥1 symptom was reported during the week of testing. Demographic information was reported through participant surveys, and influenza vaccination was verified through medical record and immunization registry review. Person-time was calculated from the start of the influenza season (September–October 2022) through date of infection, study withdrawal, or June 2023. We compared influenza incidence among vaccinated versus unvaccinated participants using Cox Proportional Hazards regression adjusted for study site and occupation. We estimated VE as (1–adjusted Hazard Ratio [HR]) x 100%.

Results: In total, 259 of 3,785 (6.8%) participants had laboratory-confirmed influenza, including 254 (98%) influenza A infections (96 [38%] A(H3N2), 67 [26%] A(H1N1)pdm09, and 91 [36%] unsubtyped). Vaccinated participants (n = 2,465) had 23.7 symptomatic and 8.0 asymptomatic laboratory-confirmed influenza infections per 100,000 person-days. Unvaccinated participants (n = 1,320) had 33.2 symptomatic and 11.6 asymptomatic infections per 100,000 person-days. VE against symptomatic illness was 36% for any influenza (HR, 95% CI: 0.64, 0.47–0.87), 43% for A(H1N1)pdm09 (0.57, 0.33–0.99), and 38% for A(H3N2) (0.62, 0.40–0.98). VE against asymptomatic infection with any influenza was not statistically significant.

Conclusions: Vaccination reduced the risk of symptomatic but not asymptomatic influenza infection. Findings support current vaccine recommendations as well as additional measures, including non-pharmaceutical interventions, to prevent influenza transmission from infected persons.

2:05 Expanding RSV-Associated Hospitalization Surveillance — Colorado, October 1, 2022–May 20, 2023

Authors: Cara C. Drehoff, N.B. Alden, I. Armistead, E. Austin, A. Burakoff, K.E. Marshall, A. Cronquist, R. Herlihy

Background: Infants, older adults, and persons with chronic conditions are at higher risk for severe respiratory syncytial virus (RSV) illness. During the 2022–2023 respiratory season, Colorado experienced unprecedented rates of RSV-associated hospitalizations, primarily among infants aged <1 year, based on reporting from the 5-county Denver metro area. Because the Denver metro area (48.8% of Colorado's population) might not be representative of the entire state, assessing differences in RSV-associated hospitalization from outside this region was prioritized for future surveillance planning.

Methods: We examined hospital discharge data for RSV-associated hospitalization cases, defined as hospitalizations with RSV-relevant *International Classification of Diseases, Tenth Revision* diagnoses codes among residents admitted to a Colorado hospital during October 1, 2022–May 20, 2023. Descriptive analyses comparing demographic and hospitalization information for patients within vs outside the 5-county Denver metro area were conducted.

Results: We identified 3,123 RSV-associated hospitalizations (56.4%, 11 cases/10,000 persons) within the metro area, compared with 2,419 hospitalizations (43.7%, 8 cases/10,000 persons) outside the region. Black persons were hospitalized for RSV at higher rates within the metro area compared with outside the region (12.5 cases/10,000 persons vs 6.4 cases/10,000 persons, respectively). Among children aged 0–4 years hospitalized for RSV, there were 2,299 (59.8%, 145 cases/10,000 persons) from the 5-county Denver metro area, compared with 1,543 (40.2%, 100 cases/10,000 persons) from outside the region. In contrast, among adults aged ≥65 years hospitalized for RSV, 481 (58.4%, 9 cases/10,000 persons) were outside the metro area, compared with 342 (41.6%, 8 cases/10,000 persons) within the 5-county Denver metro area.

Conclusions: RSV-associated hospitalizations differed between the 5-county Denver metro area and outside that region; particularly rates and burden by age groups and race. These differences support allocating additional resources to expand surveillance statewide to more fully guide public health outreach and actions.

2:25 Declines in Human Papillomavirus Vaccine Types 16 and 18 in Cervical Precancers — United States, 2008–2019

Authors: Ruth Stefanos, J.W. Gargano, R.M. Dahl, M. Vigar, E.A. Bostick, E. Debess, J.L. Castilho, L.M. Niccolai, I.U. Park, T.D. Querec, E.R. Unger, L.E. Markowitz, HPV-IMPACT Working Group

Background: Cervical cancer kills >4,000 women in the United States annually. HPV vaccination protects against types 16 and 18, which cause the majority of cervical lesions, and is most effective when given before HPV exposure. In 2006, HPV vaccination was recommended routinely for females aged 11–12 years, with catch-up vaccination through 26 years. While coverage has increased over time, it still lags behind other adolescent vaccines. Cervical cancer screening can detect cervical precancers, most of which occur in adults aged <40 years. We described trends in proportion of precancers that were HPV16/18-positive using US surveillance data, 2008–2019.

Methods: We analyzed archived cervical precancer tissues from persons aged 20–39 years in a 5-site, population-based surveillance system for 37 HPV types. We calculated the annual proportion of precancers positive for HPV16/18 overall and by vaccination status, age group, diagnosis (cervical intraepithelial neoplasia 2, 2/3, 3 and adenocarcinoma in situ [AIS]), race/ethnicity, and site. We evaluated trends in the HPV16/18-positive proportion overall and by subgroup using log-binomial regression models.

Results: The proportion of precancers that were HPV16/18-positive declined 3.6% (3.1%–4.1%) per year, on average overall, 9.7% (7.7%–11.6%) among vaccinated persons, and 2.4% (1.5%–3.3%) among unvaccinated persons. HPV16/18 proportions declined 8.5% (7.1%–9.9%) per year among persons aged 20–24 years, 5.4% (4.6%–6.2%) among persons aged 25–29 years, and 2.0% (1.1%–2.9%) among persons aged 30–34 years. Significant declines occurred in all sites, racial/ethnic groups, and diagnoses except AIS (0.9% [-0.2%–2.0%]).

Conclusions: During 2008–2019, declines in the proportion HPV16/18-positive among vaccinated and unvaccinated persons suggest both direct and indirect vaccination impact. The greater declines among younger age groups are consistent with higher vaccination coverage and increased likelihood of vaccination before exposure. Increasing HPV vaccination at the routine age will maximize cervical cancer prevention.

SESSION L: Donald C. Mackel Memorial Award Finalists

3:15–5:00 pm

Moderators: Tara Henning & Les Dauphin

3:20 Extensively Drug-Resistant *Pseudomonas aeruginosa* Associated With Contaminated Artificial Tears — Multiple States, 2022–2023

Authors: Marissa K. Grossman, D.A. Rankin, M. Maloney, R.A. Stanton, P. Gable, V.A. Stevens, T. Ewing, K. Saunders, S. Kogut, E. Nazarian, S. Bhaurla, J. Mephors, J. Mongillo, S. Stonehocker, J. Prignano, N. Valencia, A. Charles, K. McNamara, C. Huynh, W.A. Fritsch, S. Ruelle, C.A. Plucinski, L. Sosa, B. Ostrowsky, J. Noble-Wang, D.C. Ham, M.S. Walters

Background: During June–September 2022, 3 states notified CDC of healthcare facility clusters of extensively drug-resistant *Pseudomonas aeruginosa*. Whole genome sequencing (WGS) analysis showed patient isolates were closely related and were sequence type (ST) 1203 with $bla_{\text{VIM-80}}$ and $bla_{\text{GES-9}}$, antibiotic resistance gene variants that had not been previously detected in US isolates. We investigated to determine the source.

Methods: We defined cases as a US patient's first isolation of *P. aeruginosa* ST1203 with $bla_{\text{VIM-80}}$ and $bla_{\text{GES-9}}$ from any specimen source collected and reported to CDC during January 1, 2022–May 15, 2023. To generate hypotheses, we conducted a 1:1 matched case-control study at one healthcare facility. For cases nationwide, we collected information on patient product exposures and clinical outcomes. Products identified as potential sources were tested for bacterial contamination; bacterial isolates underwent WGS.

Results: We identified 81 cases from 18 states through clinical (n = 54) and surveillance (n = 27) cultures. The most frequent clinical culture sources were eye (n = 21) and urinary tract (n = 15). Four (7%) patients with clinical cultures died within 30 days of specimen collection, and 4/18 (22%) patients with eye infections and outcome information underwent enucleation. Case patients had 5 times greater odds of receiving artificial tears than controls (crude matched OR: 5.0; 95% CI: 1.1–2.8). Among cases nationwide, 61/70 (87%) patients with information reported artificial tears use, and 43/56 (77%) with brand information reported EzriCare Artificial Tears. *P. aeruginosa* ST1203 with $bla_{\text{VIM-80}}$ and $bla_{\text{GES-9}}$ was isolated from unopened EzriCare bottles; product and patient isolates were closely related via WGS analysis. EzriCare Artificial Tears was recalled.

Conclusions: Combining WGS with traditional epidemiology, we identified and stopped the dissemination of an extensively drug-resistant pathogen by a nationally distributed product. This investigation highlights the strength of collaboration between epidemiologists and laboratorians in mitigating spread of antimicrobial resistance in healthcare and the community.

3:40 Prevalence of Previous Dengue Infection Among School Children in Grades 3–10 — American Samoa, September–October 2023

Authors: Sandra Kiplagat, N. Tavale, A. Konrote, A.M. Johansson, A. Papu, J.M. Wong, J. Perez-Padilla, F.K. Jones, H. Desale, A.F. Ilimaleota, J.M.Tulafono, M. Delorey, E. Jones, E. Chutaro, J. Camacho, F. Medina, R. Tosado-Acevedo, J.L. Munoz-Jordan, G. Paz-Bailey, L. Adams, S. Anesi

Background: Dengue, an arboviral disease causing severe illness, has caused multiple outbreaks in American Samoa, with >660 cases during 2016–2018. The first dengue vaccine, Dengvaxia, is only recommended for children aged 9–16 years with a previous dengue infection and living in areas where dengue is endemic, including American Samoa. Because Dengvaxia is not recommended for people without previous infection, seroprevalence estimates in the population are critical to inform resource planning and ensure safe vaccine implementation, with seroprevalence ≥20% recommended to lower the risk of false positive prevaccination test results. Seroprevalence among vaccine-eligible ages in American Samoa is unknown.

Methods: To measure seroprevalence among children aged 9–16 years, we conducted a single-stage cluster sample of schools stratified by school type (elementary vs high school). From 5 elementary schools and 2 high schools, we tested every child who had parental permission in grades 3–10 using a CTK Onsite Dengue IgG rapid test with a sensitivity and specificity of 89.6% and 95.7%, respectively. We computed estimates of seroprevalence and 95% confidence lower bounds (LB) using design weights from a stratified, single-stage cluster sample of schools.

Results: Among 2267 children invited to participate, we tested 887 (39%). Median age was 11 (range: 7–16) years, 492 (56%) were positive, 371 (42%) were negative, and 24 (3%) had uninterpretable results. The estimated seroprevalence for all ages tested was 59% (95% LB: 50) and 60% (95% LB: 51) for individuals aged 9–16 years. The seroprevalence was lowest for children aged 8 years (46%; 95% LB: 35) and highest among children aged 13 years (72%; 95% LB: 60).

Conclusions: Dengue seroprevalence is 60% in ages eligible for vaccination, exceeding the minimum threshold of 20%. Dengue vaccination could be safely implemented as part of a comprehensive dengue control and prevention strategy in American Samoa.

4:00 Enhanced Surveillance and Vaccination of Wildlife for Detection and Management of Raccoon Rabies Virus Variant — Omaha, Nebraska, October–November 2023

Authors: Sydney R. Stein, A.J. Beron, K. Nelson, E. Price, S.E. Rodriguez, V. Shelus, A. Carpenter, A. Hess, C. Boutelle, C. Morgan, C.M. Gigante, C. Hutson, L. Orciari, R. Chipman, R. Wallace, M. Donahue, B. Buss

Background: On September 28, 2023, the Nebraska Department of Health and Human Services (NDHHS) was notified of a rabid stray kitten in Omaha. On October 6, CDC variant typing confirmed eastern raccoon rabies virus variant (RRVV) in the kitten, ~850 miles west of an endemic area. For 26 years, the US Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) has implemented wildlife rabies management to prevent RRVV spread west of the Appalachian Mountains. To prevent RRVV spread, a multiagency response was initiated to conduct enhanced rabies surveillance (ERS) and vaccinate wildlife.

Methods: Beginning October 14, NDHHS and CDC conducted ERS using a lateral flow assay on found-dead and euthanized at-risk wildlife and feral cats collected ≤10 km from the kitten. Presumptive positive and a subset of negative samples were confirmed at CDC by polymerase chain reaction and direct fluorescent antibody testing. WS conducted a trap-vaccinate-release campaign for raccoons and striped skunks during October 23–November 2 and distributed RABORAL V-RG® (Boehringer Ingelheim Animal Health USA Inc, Duluth, Georgia) oral rabies vaccine (ORV) baits during November 1–4, across 96 and 162 km2 of Omaha, respectively.

Results: The kitten's origin was undetermined. In total, 757 raccoons, 42 skunks, 4 feral cats, and 1 red fox were vaccinated, and 18,000 (ORV) baits were distributed. By November 30, among 293 tested animals, 202 (68.9%) were raccoons, 17 (5.8%) skunks, 48 (16.4%) feral cats, and 26 (8.9%) animals of other species; no additional RRVV cases were identified.

Conclusions: We investigated Nebraska's first RRVV case following prompt detection and variant typing, with ERS yielding no additional cases. Large-scale wildlife surveillance and vaccination in response to this RRVV case required comprehensive collaboration among local, state, and federal partners. Recognizing potentially long incubation periods for rabies virus, ERS will continue into 2024.

4:20 Duration of Type 2 Poliovirus Memory B Cells Amongst Children Receiving Oral and Inactivated Poliovirus Vaccines — Bangladesh, 2016–2018

Authors: Scarlett Lee, M. Mickum, D. Holthausen, K. Zaman, M. Yunus, Q. An, C. Estivariz, B.A. Mainou, A. Anand, S. Kovacs

Background: In 2016, countries using oral poliovirus vaccine (types 1 and 3 poliovirus) introduced inactivated polio vaccine (IPV) to maintain protection against type 2 poliovirus. The duration of immune memory from a single dose of IPV is unknown. We assessed the duration of detectable memory B cells elicited by four different IPV schedules in a subset of participants in a previously reported clinical trial.

Methods: A randomized, controlled, open-label inequality trial was conducted in Bangladesh. Healthy children age 18 months were recruited for an additional blood draw to assess type 2 memory B cells against poliovirus from four of the five arms of an ongoing study of IPV schedules: IPV at A) 14 weeks, B) 14 and 18 weeks, C) 14 weeks and 9 months, or D) 6 weeks and 9 months of age. The parent study assessed titers of poliovirus-neutralizing antibodies. For this study, CDC staff developed the first enzyme-linked immunosorbent spot assay to detect human memory B cells against poliovirus.

Results: Of 1,172 children randomized, parents of 1,072 consented and had blood collected for both antibody titers and memory B cells; 208 (19%) children had viable samples, with equal distributions across arms. Mean poliovirus type 2 specific memory B cells as a proportion of total B cells were similar across arms at age 18 months: A (0.79%), B (0.81%), C (0.78%), and D (1.18%). Children lacking memory B cells (n = 16) against type 2 poliovirus had a nonsignificant but lower median neutralizing antibody titer (17.0; IQR: 9.9–113.8) than those with detectable cells (n = 192) (36.0; IQR: 11.3–144.0).

Conclusions: Memory B cells against type 2 poliovirus may persist until at least age 18 months. Children who received one or two doses of IPV in infancy can generate immune memory and, therefore, may have long-term protection from paralysis due to poliovirus.

4:40 Second Multistate Tuberculosis Outbreak Caused by Contaminated Bone Tissue Allograft — Nine U.S. States, 2023

Authors: Kimberly R. Schildknecht, P. Williams, T. Thacker, K. Lehman, N. Schwartz, S. Althomsons, K. Raz, M. Grossman, C. Huynh, C. Schember, I. Griffin, E. McDonald, C. McDaniel, P. Annambhotla, S. Basavaraju, A. Starks, L. Cowen, R. Stewart, M. Haddad, J. Wortham

Background: More than 2.5 million tissue transplants occur in the United States annually. In 2021, bone tissue allograft from a single donor who died with undiagnosed tuberculosis was transplanted into 113 persons, causing a multistate outbreak. On July 7 and 11, 2023, two states alerted CDC to tuberculosis cases in post-surgical patients who had received bone allograft manufactured from a different donor than the donor in the 2021 outbreak. We investigated to determine whether these cases represented a second bone allograft-related outbreak.

Methods: In July 2023, CDC worked with the tissue establishment, health departments, and healthcare facilities to sequester unused allograft and to identify, evaluate, and treat all allograft recipients. We reviewed donor records, allograft manufacturing procedures, and clinical data for the allograft recipients. Whole-genome sequencing was performed to characterize genetic differences between *Mycobacterium tuberculosis* isolates cultured from sequestered allograft and allograft recipients.

Results: Thirty-six residents of nine states underwent spinal (n = 30) or dental (n = 6) transplantation of bone allograft manufactured from this donor. The tissue donor had died of sepsis and pneumonia of undetermined etiology. The manufacturer obtained negative *M. tuberculosis* nucleic acid amplification test results on unused allograft before distribution to healthcare facilities. Among 33 recipients tested for *M. tuberculosis* infection, 26 (79%) had positive results. As of December 8, 2023, five recipients had laboratory-confirmed tuberculosis disease. Two died of tuberculosis; the remaining 34 began treatment. Sequencing demonstrated ≤1 single nucleotide polymorphism difference (ie, high degree of genetic relatedness) between *M. tuberculosis* cultured from sequestered allograft and allograft recipients.

Conclusions: A second contaminated bone allograft caused a multistate tuberculosis outbreak and two deaths. Additional upstream interventions — donor exclusion when there is evidence of sepsis and culture-based testing of donated tissues — are needed to reduce the risk of transmitting *M. tuberculosis* through tissue products.

CONCURRENT SESSION M1: Antimicrobial Use and Hard-to-Treat Infections

9:00–10:45 am

Moderators: Wences Arvelo & Peggy Honein

9:05 COVID-19-Associated Invasive Mold Infections in an Active Surveillance System — 3 Hospitals, Atlanta, Georgia, 2020–2021

Authors: Elizabeth Sajewski, C. Mackey, S. Thomas, D. Goodenough, M. Toda, L. Gade, S.R. Lockhart, D.J. Sexton, N.T. Oliver, J.A.W. Gold

Background: Invasive mold infections (IMI) are associated with >15,000 annual US hospitalizations and high mortality rates (20%–50%). Early treatment improves outcomes. COVID-19 predisposes patients to severe IMI, but detailed surveillance data on COVID-19-associated IMIs are lacking. We compared demographic characteristics, underlying conditions, and outcomes between patients with COVID-19-associated- and non-COVID-19-associated IMIs in an active surveillance system.

Methods: The Emerging Infections Program collected surveillance data from three Atlanta-area hospitals during 2020–2021. Patients with potential IMI were identified based on positive results for mold culture or *Aspergillus* galactomannan antigen tests. We defined IMI cases as those meeting mycological, host, and clinical criteria established by the Mycoses Study Group or based on treating clinician diagnosis and antifungal treatment prescription. We defined COVID-19-associated IMIs as the presence of a positive SARS-COV-2 test result 0–90 days before the date of first positive mold specimen collection. Using chi-squared tests, we compared demographic characteristics (age, sex, race/ethnicity) and patient outcomes (intensive unit care [ICU] admission, invasive mechanical ventilation [IMV] receipt, in-hospital death) for patients with COVID-19-associated versus non-COVID-19-associated IMI cases.

Results: During 2020–2021, 140 patients had an IMI, of which 28 (20%) were COVID-19-associated. For all cases, median age was 61 years (range: 19–89 years); 90 (64%) patients were male, and 73 (52%) were White. Demographic characteristics did not differ significantly by COVID-19 status. Patients with COVID-19-associated cases (vs those with non-COVID-19-associated cases) had significantly higher rates of ICU-level care receipt (89% [25/28] vs 46% [51/112], P <.001), IMV receipt (71% [20/28] vs 34% [38/112], P <.001), and death (75% [21/28] vs 27% [30/112], P <.001).

Conclusions: IMIs in patients with COVID-19 were associated with higher mortality and more severe clinical outcomes. Our results underscore the importance of clinical awareness and prompt treatment of IMIs, particularly in patients with COVID-19 compounding severity.

9:25 Antibiotic Prescribing by General Dentists in the Outpatient Setting — United States, 2018–2022

Authors: Cam-Van T. Huynh, K. Gouin, L. Hicks, S. Kabbani, M. Neuburger, E. McDonald

Background: Inappropriate antibiotic use impacts patient safety and antimicrobial resistance patterns. In 2013, general dentists in the US prescribed nearly 10% of all outpatient oral antibiotics (24.5 million prescriptions). The American Dental Association (ADA) published guidelines in 2019 recommending limited antibiotic prescribing for the treatment of dental pain and swelling. We characterized dental prescribing during 2018–2022 to assess whether antibiotic use decreased after the guideline's release.

Methods: All antibiotic prescriptions dispensed during 2018–2022 were extracted from the IQVIA Xponent database, which captured ≥92% of all US outpatient prescriptions and projected to 100% coverage. Prescriptions by general dentists were compared to total outpatient oral antibiotic prescriptions and summarized by antibiotic agent, patient sex, patient age, and prescriber geographic region. Census denominators were used to calculate prescribing rates per 1,000 persons.

Results: General dentists prescribed 24.7 million antibiotic prescriptions in 2018 (75 prescriptions per 1,000 persons) compared with 25.2 million (76 prescriptions per 1,000 persons) in 2022. During 2020–2022, general dentists prescribed >10% of all outpatient antibiotic prescriptions (range 10.7%–12.1%). Amoxicillin was the most prescribed agent and increased from 64.0% of dental antibiotic prescriptions in 2018 to 68.1% in 2022. Clindamycin, the second most prescribed agent, decreased from 14.2% to 11.8%. In each year, prescription rates were higher for females, patients >65 years, and prescribers in the Northeast.

Conclusions: Despite the ADA's 2019 guidelines, prescribing by general dentists remained stable during 2018–2022. Because the total volume of antibiotics written by all prescribers decreased, general dentists' relative share of all outpatient antibiotic prescriptions increased to >10% in recent years. Rate variation by patient characteristics and prescriber region may reflect differences in dental disease burden or may represent unnecessary antibiotic use. Dental antibiotic stewardship is needed, including dissemination and implementation of current prescribing guidelines.

9:45 First Identified *Candida auris* Outbreak Among Patients at a Long-Term Acute Care Hospital in Columbus, Ohio — October 2023

Authors: Elizabeth Tiller, L. Sweet, J. Beard, O. Aluko, J. Keslar, E. Koch, N. Tucker, N. Hall, M. Roberts

Background: *Candida auris* is a yeast frequently resistant to antifungal medications. Patients requiring complex medical care and those who have invasive medical devices have an increased risk for infection. In October 2023, *C. auris* was confirmed in 2 patients with recent protracted stays at a long-term acute care hospital in Columbus, Ohio. Columbus Public Health and the Ohio Department of Health investigated to characterize the outbreak, identify colonized patients at the facility, and prevent further transmission.

Methods: We identified patients who had been admitted to the same units as the initial patients for >72 hours. On October 31, 2023, swabs were collected from the axilla and groin of patients still admitted and tested for *C. auris* by real-time polymerase chain reaction. Repeat testing of all patients admitted to the facility was performed on November 21, 2023. We contacted other facilities and jurisdictions to request testing for patients who were discharged.

Results: In total, 31 admitted patients and 6 discharged patients were tested for *C. auris* during October 31–November 14, 2023, of which 4 patients were positive for *C. auris*. Median patient age of the 4 *C. auris* positive patients was 64.5 years (range: 41–68 years). All patients had medical devices (eg, tracheostomy tubes, feeding tubes, or indwelling catheters). No patients had clinical signs of *C. auris* infection or received anti-fungal therapy for *C. auris*. No deaths were reported. Additionally, 75 admitted patients were tested on November 21, 2023; none were positive.

Conclusions: On October 27, 2023, the first outbreak of *C. auris* within Columbus, Ohio, was confirmed in a long-term acute care hospital. Healthcare providers should be aware of the possibility of C. auris colonization in patients, especially in those at risk for infection, and ensure adherence to infection prevention practices such as standard precautions and hand hygiene.

10:05 Outbreak of New Delhi Metallo-beta-Lactamase-Producing *Klebsiella pneumoniae* — New Hampshire, 2023

Authors: Steven D. Langerman, D. Cray, M. Ali, N. Shrivastwa, M.A. Khan, B. Ostrowsky, D.A. Rankin, M. Kenney, A. Williams, L. Tetreault, S. Verow, P. Gable, J. Noble-Wang, R.A. Stanton, K. Clancy, M. Howard, W. Norfolk, J.R. Upton, L.M. Hagan, C. Waddell, M. Walters, K. Hansen

Background: In 2023, two cases of NDM-producing *Klebsiella pneumoniae* (NDM-Kp), an uncommon multidrug-resistant organism, were identified from inpatient wound cultures at a New Hampshire acute care hospital (ACH). The patients were residents of a shelter for persons experiencing homelessness (PEH). CDC and the New Hampshire Department of Health and Human Services collaborated to investigate the scope and source of the outbreak.

Methods: We defined a case as NDM-Kp isolated from any specimen source from a New Hampshire resident during June–October 2023. We performed colonization screening of 28 ACH patients with epidemiologic links to the initial NDM-Kp patients. We abstracted case data from medical records and performed infection prevention and control (IPC) observations at the ACH and shelter. We performed whole genome sequencing (WGS) of NDM-Kp isolates.

Results: We identified a total of three cases; the third was identified from colonization screening. The median patient age was 69 years, 2 were female, all received inpatient wound care before isolation of NDM-Kp, and 2 were PEH when hospitalized. IPC observations in the ACH identified gaps in wound care practices and environmental cleaning. Observations at the shelter revealed few opportunities for transmission between these specific patients (limited spatiotemporal overlap, sex-segregated dorms, and bathrooms). WGS showed that all 3 cases were closely

Conclusions: We identified an outbreak of NDM-Kp with case exposures at a shelter for PEH and an ACH. WGS analysis was consistent with transmission. We determined that the most likely location of transmission was the ACH and recommended they standardize environmental cleaning and wound care practices and implement enhanced surveillance for NDM-Kp. We also recommended that affected patients be prioritized for stable housing resources. Future investigations of antibiotic-resistant organisms among PEH should consider potential for transmission in both healthcare and congregate housing environments.

10:25 Canine Cases of Carbapenemase-Producing Carbapenem-Resistant *Pseudomonas aeruginosa* Associated With a Multistate Outbreak Linked to Artificial Tears — New Jersey, 2023

Authors: Emma R. Price, D. McDermott, A. Sherman, L. Kelley, J. Mehr, R. Greeley, S. Cole

Background: Carbapenemase-producing organisms (CPOs) are resistant to most antibiotics and can spread antimicrobial resistance genes rapidly. During March–June 2023, CDC and the New Jersey Department of Health (NJDOH) were notified of carbapenemase-producing carbapenem-resistant *Pseudomonas aeruginosa* (CP-CRPA) isolated from a bronchial and external ear sample of 2 separately owned canines treated at the same veterinary hospital. Canine isolates were highly genetically related to isolates from a human multistate CP-CRPA outbreak linked to contaminated over-the-counter artificial tears. NJDOH's investigation assessed introduction and transmission opportunities within the veterinary hospital.

Methods: We interviewed the canine owners, reviewed veterinary medical and hospital purchase records, and conducted an onsite infection control assessment. We performed bacterial culture and sensitivity testing of drains, shared equipment, and ophthalmology products at the veterinary hospital to identify potential reservoirs.

Results: Owners denied eye-drop use, household exposure to human healthcare settings, and international travel since March 2022. One canine received over-the-counter artificial tears product, but not the outbreak-associated brand. The veterinary hospital did not stock the outbreak-associated brand. Shared exposures included treatment in the veterinary hospital's surgical preparation and recovery areas for both canines and ophthalmology department visits by either the affected canine or another animal in the same household. We identified gaps related to hand hygiene, personal protective equipment use, and equipment and environmental cleaning and disinfection. No cultures grew the outbreak strain.

Conclusions: Our identification of CP-CRPA canine cases linked to a human outbreak highlights the importance of notifying veterinarians of contaminated over-the-counter products and antimicrobial resistance mechanism testing by veterinary diagnostic labs. Although transmission route remains unknown, canine at-home and hospital treatments suggest contaminated products or hospital-associated secondary transmission. Implementing antimicrobial resistance mechanism testing combined with veterinary hospital infection prevention and control measures could elucidate CPO transmission, particularly the role of interspecies transmission, and help control outbreaks.

CONCURRENT SESSION M2: Public Health Surveillance

9:00–10:45 am

Moderators: Robyn Cree & Deron Burton

9:05 Multistate Foodborne Illness Outbreaks Associated With Nuts and Seeds — United States, 1998–2022

Authors: Gabriel K. Innes, G. Davidson, M. Kirchner, K. Manikonda, A. Tatavarthy, Z.D. McCormic, L. Gieraltowski, T. Eisenstein, K.E. Marshall, S. Viazis

Background: Most foodborne illnesses are attributed to contaminated animal-based products and fresh produce. Nuts (including tree nuts and peanuts), seeds, and downstream products have been identified as food vehicles for pathogens. The passage of the Food Safety Modernization Act (FSMA) in 2011 and progressive incorporation of whole-genome sequencing (WGS) techniques in outbreak detection since 2013 have strengthened multijurisdictional outbreak investigations, although their full impact is unknown. We described multistate outbreaks in the United States associated with nuts and seeds during 1998–2022 and compared outbreaks before 2011 with later years.

Methods: We used descriptive statistical methods to analyze data from multistate foodborne illness outbreaks attributed to nuts and seeds from CDC's National Outbreak Reporting System. Number of outbreaks detected, case-patients per outbreak, and number of states involved per outbreak were statistically compared between 1998–2010 and 2011–2022 using Mann-Whitney U tests.

Results: Nuts and seeds were implicated in 27 multistate outbreaks, causing 1,940 illnesses, 367 hospitalizations, and 11 deaths, and with illnesses reported in all 50 states. Nuts were the implicated vehicle in 22 (81%) outbreaks; 5 outbreaks were attributed to seeds. Six outbreaks were detected during 1998–2010, impacting a median of 16.5 states (interquartile range [IQR] = 5) and infecting a mean of 259 case-patients (standard deviation [SD] = 353); 21 outbreaks during 2011–2022 resulted in a mean of 21 cases-patients per outbreak (SD = 12) across a median of 6 states (IQR = 16.5). More outbreaks were detected in 2011–2022 than in 1998–2010 (P = .003) but were associated with fewer illnesses (P = .012).

Conclusions: Contaminated nuts and seeds have caused several large multistate outbreaks. The increase in detected outbreaks paired with decrease in average illnesses after FSMA enactment and WGS adoption could indicate the benefits of early detection and outbreak response.

9:25 Evaluation of SARS-CoV-2 Genomic Surveillance — New York City, 2023

Authors: Roisin McElroy, J. Wang, F. Taki, R. Rohrer, S. Greene, S. Ahuja, A. Fireteanu, E. Luoma

Background: During the COVID-19 pandemic, adolescents reported experiencing poor mental health and additional stressors. These factors can contribute to increases in substance use, including marijuana; however, little is known about adolescent marijuana use patterns during the pandemic. We examined the association between adolescents' experiences during the pandemic and the prevalence of current and frequent marijuana use to inform adolescent marijuana use prevention strategies.

Methods: The Adolescent Behaviors and Experiences Survey (ABES) was a one-time cross-sectional, nationally representative survey of 9th through 12th grade students in the United States conducted by CDC during January–June 2021. Adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) were used to assess the association between ten COVID-19-related experiences and behaviors (e.g., poor mental health, job loss, food insecurity, schoolwork difficulty, physical abuse, alcohol drinking) and current (past 30 days) and frequent (≥ 20 times in the past 30 days) marijuana use. Models were adjusted for sex, race/ethnicity, grade, and sexual identity. Analyses were weighted to account for sampling design.

Results: From January–June 2021, 13% of high school students reported current marijuana use; among those, 27% reported frequent use. All experiences/behaviors except virtual connectedness during the pandemic were associated with current marijuana use. Self-reported increased alcohol consumption during the pandemic had the strongest association (aPR: 3.6; 95% CI: 3.1, 4.3). Students experiencing parental emotional abuse, parental physical abuse, or poor mental health had over two times greater prevalence of current marijuana use. Factors associated with frequent marijuana use were parental job loss and student job loss during the pandemic.

Conclusions: Adolescents who reported stressful experiences during the pandemic were more likely to report current marijuana use. Job loss was also associated with frequent marijuana use. Characterizing adolescents' experiences during the pandemic that are associated with marijuana use can inform future prevention and intervention strategies.

9:45 Evaluating the Metropolitan Atlanta Congenital Defects Program's Surveillance System for Birth Defects Study to Evaluate Pregnancy exposureS Eligible Cases — Atlanta, Georgia, 2016–2022

Authors: Rachel O. Alade, E.C. Ailes, S.L. Farr, J. Glidewell, J. Cragan, E. Gray, M. Milord, M. Merriweather

Background: Birth defects are the leading cause of infant mortality in the United States; two-thirds of defects have no known etiology. The Metropolitan Atlanta Congenital Defects Program (MACDP) monitors the prevalence of all major defects, informs public health interventions, and provides cases to the Georgia site of the Birth Defect Study to Evaluate Pregnancy exposureS (BD-STEPS). BD-STEPS assesses risk factors for 22 major structural birth defects by interviewing mothers of birth defect cases (and liveborn controls) within 18 months post-estimated date of delivery (EDD). This surveillance evaluation examined birth defect case data flow between MACDP and BD-STEPS from 2016–2022 to identify opportunities to improve data quality and timeliness.

Methods: We calculated the proportion of MACDP subjects that met BD-STEPS eligibility criteria. We assessed data quality using key variable completeness. We conducted qualitative interviews with staff to evaluate data entry practices. Finally, we assessed timeliness by calculating the percent of subjects identified within 18 months of EDD, overall, and by defect type.

Results: MACDP identified 3,159 potential Georgia BD-STEPS subjects between 2016–2022; 748 met BD-STEPS inclusion criteria (748/3159, 23.7%). Few BD-STEPS eligible subjects (0.1–0.8%) had missing data for key variables. Per staff report, transfer of data between systems often required manual entry. Of 748 potential subjects, 710 (94.9%) were identified ≤18 months of their EDD. No single birth defect was overrepresented among the 38 (5.1%) subjects identified >18 months after EDD.

Conclusions: MACDP provides timely and complete data to the Georgia BD-STEPS study site and casts a wide net for identification of BD-STEPS subjects. Minimizing manual data entry ensures that MACDP delivers high-fidelity data to BD-STEPS. The successful collaboration between MACDP and BD-STEPS improves understanding of birth defect risk factors.

10:05 Invasive Group B Streptococcal Disease Among Non-Pregnant Adults — Alaska, 2000–2021

Authors: Victoria A. Balta, S. Bressler, S. Massay, L. Orell, A. Reasonover, M. Harker-Jones, T. Kretz, H. Scobie, M. Fischer, J. McLaughlin, J. Steinberg

Background: Invasive group B streptococcal (GBS) disease occurs when *Streptococcus agalactiae* infects a sterile body site. Invasive GBS causes serious clinical manifestations, including sepsis, pneumonia, and soft tissue, bone, and joint infections. Several GBS vaccines are being developed. We assessed invasive GBS trends among non-pregnant Alaska adults during 2000–2021.

Methods: Using statewide laboratory-based invasive GBS surveillance data, we performed descriptive analyses and calculated annual age-specific and age-adjusted incidence per 100,000 adults aged ≥18 years with 95% CI. To assess changes over time, we used Poisson regression to estimate incidence rate ratios with 95% CI by Alaska Native status and time-period (2000–2010 versus 2011–2021).

Results: During 2000–2021, 817 cases of invasive GBS were reported for an age-adjusted average annual incidence of 8.3 (95% CI: 7.8–8.9) cases per 100,000 adults. Annual incidence was 1.8 (95% CI: 1.4–2.2) for ages 18–39 years, 7.9 (7.1–8.7) for ages 40–64 years, and 24.2 (95% CI: 21.6–26.8) for ages ≥65 years. Age-adjusted incidence increased from 5.7 (95% CI: 4.9–6.5) during 2000–2010 to 10.4 (95% CI: 9.5–11.2) during 2011–2021 (rate ratio = 1.9; 95% CI 1.6–2.3). Age-adjusted incidence among Alaska Native people was 2.0 (95% CI: 1.7–2.3) times higher compared to non-Alaska Native people. Among the 817 adults with invasive GBS, 714 (87%) had ≥1 risk factor, including 387 (47%) with diabetes, 162 (20%) with congestive heart failure, and 151 (19%) who smoked. Overall, 739 (91%) case patients were hospitalized, and 63 (8%) died.

Conclusions: Incidence of invasive GBS nearly doubled during the analysis period. Our findings highlight the importance of continued surveillance to monitor and evaluate this increase. GBS vaccines could potentially decrease the burden of invasive GBS in Alaska, especially among people aged ≥65 years and those with certain risk factors.

10:25 Improving Pregnancy-Associated Death Identification in Wyoming

Authors: Michelle Azar, A. Busacker, M. Lewis, A. Harrist

Background: Maternal mortality surveillance is conducted using death records to identify pregnancy-associated deaths (deaths during or within one year of pregnancy) and is utilized by the Centers for Disease Control and Prevention and local and state Maternal Mortality Review Committees (MMRCs). In 2003, Wyoming updated its death certificate to include a question regarding the pregnancy status of decedents. To reduce the number of false-positive pregnancy-associated deaths identified, an automated verification tool was added to the death certificate registration system in 2018. The verification prompts death certifiers for confirmation when they select a checkbox indicating pregnancy. The goal of this evaluation is to determine if the accuracy of the death certificate pregnancy checkbox improved after Wyoming implemented the pregnancy checkbox verification.

Methods: Pregnancy-associated deaths in Wyoming from 2016–2021 were evaluated for the accuracy of the death certificate pregnancy checkbox based on verification from at least one other source (linkage between a maternal death certificate and fetal death or birth certificate, language in the death certificate's cause of death description, or documentation from an autopsy/coroner report). Cases were considered "true positives" if they had at least one other source verifying pregnancy. "False negative" cases were identified through at least one of the verification sources described but were not indicated through the death certificate pregnancy checkbox. Cases were considered a "false positive" if the pregnancy checkbox indicated pregnancy and the pregnancy could not be confirmed through any of the verification sources. The sensitivity and positive value predictive (PVP) of the pregnancy checkbox were calculated and compared for the time periods before (2016–2017) and after (2019–2021) **Results:** From 2016–2017, 5 deaths were identified as "true positives", 6 as "false positives", and 2 as "false negatives". From 2019–2021, 13 deaths were identified as "true positives", 1 as "false positive", and 0 "false negatives." The sensitivity of the pregnancy checkbox increased from 71% in 2016–2017 to 100% in 2019–2021. The predictive value positive (PVP) increased from 45% in 2016–2017 to 93% in 2019–2021, demonstrating a decrease in the number of false positive cases identified through the pregnancy checkbox.

Conclusions: Accurate case identification is crucial to effectively reduce maternal mortality across the United States. Recent additions to the Wyoming death registration system have increased the accuracy of Wyoming's MMRC case identification process. These enhancements may be tested in other states or localities to increase accuracy and efficiency of maternal mortality surveillance nationally.

CONCURRENT SESSION N1: Mpox and Syphilis

11:15 am–12:40 pm

Moderators: Grace Marx & Lindley Barbee

11:40 Mpox Among Persons Who Self-Identified as Men Who Have Sex With Men or as Transgender, Stratified by Reported Housing Status and Participation in Exchange Sex: A Multijurisdictional Case-Control Study — United States, August 19, 2022–September 12, 2023

Authors: Caroline J. Waddell, A.O. Diallo, A.F. Dalton, A.N. Chard, A. Board, I. Kracalik, N.P. Deputy, D.L. Moulia, L.M. Hagan, L.R. Feldstein

Background: During the 2022 mpox outbreak, gay, bisexual, and other men who have sex with men (MSM) were the most affected communities. Additional communities with unknown risk for mpox include people experiencing homelessness (PEH), who had increased mpox-related hospitalizations and deaths during the outbreak, and people participating in transactional sex, who could have occupational exposures. Due to limited data on these additional communities, we examined the risk of mpox for PEH and people participating in transactional sex among a sample of people who identified as MSM or as transgender.

Methods: During August 19, 2022–September 12, 2023, a case-control study was conducted in 12 US jurisdictions among people who self-identified as MSM or as transgender. Case patients had a confirmed or probable *Monkeypox virus* or *Orthopoxvirus* diagnosis, identified through jurisdictional case registries. Control patients visited a sexual health clinic but had never received a mpox diagnosis. Participants reported their housing status and participation in transactional sex. We performed multivariable logistic regression, accounting for geography and index date, to calculate adjusted odds ratios (aOR) for mpox disease among PEH or people participating in transactional sex within this study sample.

Results: Of 365 case patients, 318 (87%) reported neither homelessness nor transactional sex, 8 (2.2%) reported both, 20 (5.5%) homelessness only, and 19 (5.2%) transactional sex only. Of 821 control patients, 772 (94%) reported neither, 7 (0.9%) reported both, 19 (2.3%) homelessness only, and 23 (2.8%) transactional sex only. The aOR was 2.4 (95% CI: 1.1–5.2) for people reporting homelessness and 2.1 (95% CI: 1.0–4.4) for people participating in transactional sex.

Conclusions: People who identify as MSM or as transgender who experience homelessness or participate in transactional sex face a greater risk for mpox compared to MSM and transgender people reporting neither. These communities should be considered for tailored interventions during future outbreaks.

11:40 Evolving Trends of an Accelerating Syphilis Epidemic — Alaska, 2018–2022

Authors: Julia H. Rogers, H. Guzzi, E.C. Ohlsen, J.C. Stump, L. Castrodale, J. Wright, J. McLaughlin

Background: Alaska is experiencing a rapidly escalating syphilis epidemic. We characterized the changing epidemiology of syphilis in Alaska during 2018–2022 to guide public health interventions.

Methods: We analyzed all-stage acquired syphilis and congenital syphilis (CS) case report data from Alaska's sexually transmitted infections surveillance system during 2018–2022. Incidence rates were calculated using Alaska Department of Labor population estimates and standardized to the 2000 US population or annual live births from Alaska vital records (for acquired syphilis case reports received and CS occurrences, respectively). Incidence rates were compared using incidence rate ratios (IRRs). Prevalence ratios (PRs) compared a characteristic's prevalence among acquired syphilis cases in 2022 to 2018.

Results: Acquired syphilis incidence increased from 15.4 cases/100,000 persons (N = 113) in 2018 to 52.0 cases/100,000 persons (N = 412) in 2022 (IRR: 3.37; 95% CI, 1.91, 5.96). During 2018–2022, the proportion of cases reported from American Indian or Alaska Native persons increased from 30.1% to 41.7% (PR: 1.39; 95% CI: 1.02, 1.88); the proportion of cases from cisgender women increased from 14.2% to 46.6% (PR: 3.3; 95% CI: 2.07, 5.24); and the proportion of cases from men who have sex with men decreased from 62.8% to 14.1% (PR: 0.22; 95% CI: 0.17, 0.30). The proportion of unknown duration/late syphilis cases increased from 14.1% to 33% (PR: 2.33; 95% CI: 1.45, 3.75). In 2022, the prevalence of unknown duration/late syphilis was higher among cisgender women cases (39.1%) than cisgender men cases (27.3%), and the incidence of CS rose to 119/100,000 live births (from 9.9/100,000 live births in 2018).

Conclusions: The incidence of syphilis in Alaska has increased considerably since 2018, and the epidemiology has shifted to involve more cisgender women, infants born with CS, and persons staged as unknown duration/late syphilis. This updated information will help direct Alaska-specific outreach and response strategies.

12:00 Factors Contributing to Congenital Syphilis and Missed Opportunities for Prevention — Clark County, Nevada, 2017–2022

Authors: Jessica A. Penney, A. Stachnik, C. Radeloff, T. Eddleman, H. Laird, Y. Zhang, C. Lockett

Background: In 2021, Nevada ranked ninth in the United States for rate of congenital syphilis (CS), a preventable infection passed from pregnant persons to their infants. We sought to identify opportunities for CS prevention to reduce CS burden in Clark County, Nevada.

Methods: We analyzed confirmed and probable syphilis cases among pregnant persons from Clark County reported during 2017–2022. We compared clinical and behavioral characteristics of pregnant persons with and without infants with CS. Access to prenatal care and syphilis screening ≥45 days before delivery were considered timely, as was treatment ≥30 days before delivery. Among those with timely syphilis treatment, we documented reported treatment failures or reinfections. We matched surveillance data to emergency department (ED) data to quantify ED encounters during pregnancy without syphilis screening among persons with infants with CS.

Results: During 2017–2022, we identified 530 pregnancies with syphilis and 195 infants with CS. Drug use was more prevalent among gestational parents of infants with CS (58.1% vs 39.8%; P value <.001). Among 195 gestational parents of infants with CS, 111 (56.9%) did not receive prenatal care. Among 84 pregnant persons receiving prenatal care, care was timely in 49 (58.3%) with 35 of those receiving timely screening. Among these 35 pregnant persons, 14 (40%) received treatment ≥30 days before delivery. However, 7 (50%) had treatment failure or reinfection based on serologic response. Among gestational parents of infants with CS, 112 (57.4%) had ≥1 ED encounter during pregnancy with 79 (70.5%) not screened for syphilis during the encounter.

Conclusions: Lack of prenatal care was a considerable barrier to timely testing and treatment in Clark County, Nevada. Multiple CS prevention opportunities exist, including addressing barriers to prenatal care and increasing syphilis screening at alternative healthcare encounters. Quantifying missed prevention opportunities will guide community efforts to address CS.

12:20 Enhanced Mpox Surveillance With GeneXpert Molecular Diagnostic Testing Systems — Tshuapa and Tshopo Provinces, Democratic Republic of Congo, 2022–2023

Authors: Victoria Shelus, Y. Li, K. Wilkins, M. Kupa, S. Musala, E. Simbu, E. Muyamuna, T. Likafi, B. Nguete, J. Kabamba, P. Mbala, M. Kaswa, D. Kaba, A.M. McCollum

Background: Mpox is a zoonotic Orthopoxvirus (OPXV) infection caused by monkeypox virus (MPXV). The Democratic Republic of Congo (DRC) has the highest burden of endemic disease, reporting >1,000 suspected mpox cases annually, with case fatality rates up to 11%. Mpox is often misdiagnosed as varicella-zoster virus (VZV), and diagnostic testing is currently limited to one national laboratory, with substantial delays between specimen collection and testing. This project aimed to strengthen laboratory-based surveillance for MPXV in DRC and decrease mpox confirmation, reporting, and response times.

Methods: CDC developed and validated a multiplex OPXV, MPXV, and VZV real-time PCR assay on the GeneXpert platform for portable and rapid diagnostic testing. Provincial laboratories in Tshuapa and Tshopo provinces performed the assay on prioritized samples from suspected mpox cases. The national laboratory conducted confirmatory gold standard OPXV and VZV real-time PCR assays. Data were analyzed for concordance.

Results: Between September 2022 and June 2023, specimens from 243 individuals with suspected mpox were tested using the multiplex assay in the two provinces. The median number of days from illness onset to testing at a provincial laboratory was 18.5 days, compared to 36 days at the national laboratory. GeneXpert results were available for 231 cases: 73% were positive for OPXV and MPXV, 7% were positive for VZV, 6% were negative, and 13% required further review. A direct comparison of 226 cases where both GeneXpert and gold-standard real-time PCR results were available found that only 3 results were discordant.

Conclusions: GeneXpert testing for MPXV at the provinces increased diagnostic timeliness, with high concordance between field and confirmatory results. These results could inform recommendations for enhanced surveillance in mpox endemic countries. Leveraging existing GeneXpert capacity closer to the point of case detection could lead to faster public health responses and management of severe cases.

CONCURRENT SESSION N2: Nutrition

11:15 am–12:40 pm

Moderators: Brian Kit & Carolyn Greene

11:20 Progress and Disparities in Breastfeeding Rates by Race and Ethnicity, National Immunization Survey-Child — United States, 2010–2020

Authors: Adi Noiman, R. Li, C. Kim, J. Chen, H. Hamner, L. Elam-Evans

Background: Breastmilk is the best source of nutrition for most infants. Healthy People 2030 (HP2030) has set national targets to improve breastfeeding rates. Evidence suggests breastfeeding disparities by race and ethnicity, independent of other sociodemographic characteristics, contribute to disparities in disease prevalence and mortality. We examined breastfeeding trends among children born between 2010–2020 and gains needed to achieve HP2030 targets by race and ethnicity.

Methods: The National Immunization Survey-Child is a nationally representative phone survey estimating vaccination and breastfeeding rates among children aged 19–35 months. We used weighted least-squares regression to compare breastfeeding trends among children born between 2010–2020 by parent-reported child race and ethnicity (Hispanic, non-Hispanic Asian, non-Hispanic Black, non-Hispanic White, or non-Hispanic ≥2 races). We estimated percentage point differences (%) between rates of children born in 2020 and HP2030 targets for exclusive breastfeeding through 6 months (target: 42.4%) and any breastfeeding at 12 months (target: 54.1%) by race and ethnicity.

Results: Rates of exclusive breastfeeding through 6 months increased significantly over time for all groups; rates of any breastfeeding at 12 months increased significantly over time for all groups except non-Hispanic Asian children (P <0.05). Among children born in 2020 (n = 21,069), gains needed to reach the exclusive breastfeeding through 6 months and any breastfeeding at 12 months targets were smallest among non-Hispanic Asian children (13.3% and 5.6%, respectively) and largest among non-Hispanic Black children (22.2% and 27.3%, respectively).

Conclusions: For children born between 2010–2020, breastfeeding rates significantly improved over time among most race and ethnicity groups. Gains needed to achieve HP2030 targets were substantial and varied by group. To achieve national breastfeeding targets and reduce disparities, public health practitioners can implement community-level, evidence-based interventions tailored to address challenges faced by different race and ethnicity groups, particularly those with the lowest breastfeeding rates.

11:40 Substitution Preferences for Sugar-Sweetened Beverages Among Adults by Sociodemographic Characteristics — United States, 2021

Authors: Alexander H.W. Molinari, S. Lee, S. Pierce, B. Belay, C. Dooyema, A. Goodman

Background: Sixty-three percent of US adults report drinking at least one sugar-sweetened beverage (SSB) per day. Excessive consumption of SSBs is associated with chronic health conditions, including obesity, type 2 diabetes, and heart disease. Understanding preferences for SSB substitutes could enhance public health messaging and interventions to reduce SSB consumption.

Methods: This study used SummerStyles 2021, a cross-sectional panel survey representative of noninstitutionalized US adults. Respondents who reported being current consumers of SSBs and expressed interest in changing their intake amount (n = 2,552) were asked whether they would consider substituting six alternative drinks for SSBs. They could select multiple options. No time frame for changing was specified. The outcome variables were "yes" responses for the six alternatives. Exposure variables included respondent characteristics (age, sex, race/ethnicity, BMI category, education, marital status, household income, geography) and frequency of SSB consumption over the past 7 days. Multivariable logistic regression analysis was conducted via SAS 9.4.

Results: Among 2,552 US adults, 71% reported considering plain water as an SSB substitute; 36% considered flavored water, 27% sparkling water, 25% herbal tea, 19% diet drinks, and 18% unsweetened coffee. Individuals reporting an annual household income of <$35,000 had 0.6 (0.43, 0.85) lesser adjusted odds to consider plain water than those with income >$100,000. Individuals with overweight or obesity had 1.7 (95% CI: 1.20, 2.29) to 1.9 (1.39, 2.63) times greater adjusted odds, respectively, of considering diet drinks compared to those with healthy weight or underweight. Individuals identifying as non-Hispanic Other (non-White/non-Black) race had 1.9 (1.32, 2.69) times higher adjusted odds of considering herbal tea than non-Hispanic White.

Conclusions: When considering lower-calorie substitutes for SSBs, population subgroups have varying preferences. Understanding these preferences could aid public health and healthcare practitioners to better craft communication messaging and interventions on appealing substitution choices for specific audiences.

12:00 Factors Predicting Red Blood Cell Folate Insufficiency Among Women of Reproductive Age — NHANES, 2007–2020

Authors: Amy Fothergill, A. Wang, K.S. Crider, L.F. Yeung, C.T. Mai, J.L. Williams

Background: Maternal red blood cell (RBC) folate insufficiency before and during pregnancy increases the risk of having a baby with neural tube defects (NTDs), severe birth defects of the brain and spine. Approximately 20% of US women of reproductive age (WRA; 12–49 y) have insufficient RBC folate concentrations (<748 nmol/L). Identifying population subgroups or modifiable factors associated with RBC folate insufficiency could help inform NTD prevention efforts.

Methods: National Health and Nutrition Examination Survey (2007–2020) data were used to examine population subgroups and factors associated with RBC folate insufficiency (<748 nmol/L) among a nationally representative sample of non-pregnant, non-lactating WRA in the United States (n = 5,479). Multivariable predictive logistic regression models were built using variables selected a priori and additional variables with P <.157 for bivariate association; models were used to identify sets of variables that best predicted having insufficient RBC folate concentrations. Appropriate sample weights (ie, fasting subsample) were utilized to account for differential non-response, non-coverage, and the oversampling of specific groups in the survey.

Results: In multivariable logistic regression models, age, race/ethnicity, years lived in the United States, and serum folate concentrations emerged as having the strongest associations with RBC folate insufficiency. In adjusted models, non-Hispanic Black WRA (OR: 4.5 [95% CI: 1.3, 16.1]) had higher odds of RBC folate insufficiency compared to non-Hispanic White WRA, and WRA aged 12–24y (OR: 1.8 [95% CI: 1.1, 3.0]) had higher odds of RBC folate insufficiency compared to WRA 35–49y.

Conclusions: Findings suggest that population subgroups might benefit from further efforts to improve RBC folate status. Public health interventions in these groups that encourage increasing consumption of fortified foods and/or use of supplements could help reduce RBC folate insufficiency.

12:20 Trends in Milk Consumption Among Youth and Adults — United States, 2009–2010 Through 2017–March 2020

Authors: Samuel D. Emmerich, B. Stierman, C. Ogden

Background: Vitamin D is essential for bone health and osteoporosis prevention. More than 90% of the US population consumes less vitamin D than recommended. The Dietary Guidelines for Americans (DGA) dairy group, which includes dairy milk and fortified soy beverages, is a rich source of vitamin D. Alternative milks, including non-soy plant "milks," are not included due to their lack of nutritional equivalence, but have become more available. We examined recent trends in milk consumption over time in the United States.

Methods: Using a limited 30-day food frequency questionnaire within the National Health and Nutrition Examination Survey, a series of cross-sectional surveys representative of the US population, we categorized participants (n = 52,190) into three groups of milk consumers: any dairy or soy milk, only alternative milk, and no milk. Accounting for complex survey design, we calculated prevalence and analyzed time trends during 2009–March 2020 using logistic regression (unadjusted and adjusted for age, sex, race/ethnicity, and income) for each group among youth (aged 2–19 years) and adults (aged ≥20 years).

Results: The prevalence of youth consuming any dairy or soy milk in the previous 30 days decreased (95.0% in 2009–2010 to 88.6% in 2017–March 2020), only alternative milk increased (1.9% to 4.9%), and no milk increased (3.2% to 6.5%). Among adults, any dairy or soy milk decreased (82.1% to 68.8%), only alternative milk increased (1.8% to 7.6%), and no milk increased (16.0% to 23.5%). Trends were statistically significant (P <.001). Adjusting for demographic changes did not alter the findings.

Conclusions: During 2009–March 2020, milk consumption patterns changed. When recommending dietary sources of vitamin D, the DGA should consider that fewer youth and adults are consuming dairy-group beverages. Alternative milks, which may not be fortified with vitamin D, are becoming more commonly consumed.

SESSION O: Late-Breaking Reports

3:15–4:20 pm

Moderator: Eric Pevzner & Nirav Shah

3:20 Norovirus Outbreak at a Manhattan Restaurant — New York City, December 2023

Authors: Leah D. Seifu, J. Latash, D. O'Halloran, Y. Brooks, R. Barnes, E. Kopping, Y.W. Ng, E. Ahmetaj, J. Montfort Gardeazabal, M. Wong, J. Plitnick, H. Waechter

Background: During December 14–15, 2023, New York City's (NYC) health department received 3 complaints of gastrointestinal illness from 2 parties that dined at the same Manhattan restaurant during December 11–12. Reports indicated >70% of diners in each party developed illness. We investigated to identify the source and prevent further illness.

Methods: We conducted case-finding by interviewing restaurant patrons who dined during December using the restaurant's reservation list. A case was defined as diarrhea or vomiting, and either nausea, abdominal cramps, or fever, in a person who consumed restaurant food during December 11–29. Risk ratios were calculated to identify foods associated with illness. We evaluated restaurant food-handling practices and sick leave policies, interviewed foodhandlers, and tested stool samples from ill patrons and foodhandlers for enteric bacteria and viruses. We supervised restaurant disinfection procedures and provided norovirus education to restaurant staff.

Results: Among 243 restaurant reservations identified, we interviewed 93 patrons and found 20 (22%) cases. Most common symptoms were nausea (95%), fatigue (95%), diarrhea (90%), and chills (90%), with illness onsets during December 12–19; median incubation period was 31 hours (range: 6–55 hours). No food items were associated with illness. One foodhandler who prepared food during December 11–12 later called out sick. Three of 6 foodhandlers interviewed were unaware of the restaurant's paid sick leave policy, which complied with NYC law. Stool samples from 4 of 11 foodhandlers and 2 of 2 patrons tested positive for norovirus genogroup II. No cases were identified among patrons who dined within 7 days after restaurant disinfection on December 22.

Conclusions: This norovirus outbreak was likely caused by ill foodhandlers. Restaurant disinfection and health education likely ended the outbreak. Future norovirus outbreaks might be prevented by ensuring foodhandler awareness of restaurant sick leave policies, especially when legally mandated.

3:30 Supplemental Immunization Activity Response Timeliness for Circulating Vaccine-Derived Poliovirus Outbreaks — Worldwide, 2016–2023

Author: Keri Geiger, N. Heaghney, J.P. Bigouette, S.D. Bennett, S.D. Kovacs, S.G.F. Wassilak

Background: As of February 2024, there are 50 active circulating vaccine-derived poliovirus (cVDPV) outbreaks in 30 countries. Outbreak transmission of cVDPV is more likely to be promptly interrupted when response supplementary immunization activities (SIAs) are quickly implemented. We assessed SIA response timeliness for cVDPV outbreaks occurring from 2016–2023, comparing timeliness for outbreak responses occurring during 2021–2023 to previously reported responses occurring before 2021.

Methods: World Health Organization (WHO) data from Poliovirus Information System (POLIS) were analyzed to compare timeliness of first and second SIAs occurring in response to cVDPV outbreaks during 2021–2023 versus 2016–2020 in countries in the WHO African (AFR) and Eastern Mediterranean (EMR) regions. SIAs were considered timely if the interval between outbreak confirmation and first SIA was ≤28 days and for the second, ≤56 days. We counted the number of outbreaks which had a breakthrough virus, defined as an acute flaccid paralysis (AFP) case or environmental detection with the same poliovirus strain 22–365 days after the second SIA started.

Results: For 64 cVDPV outbreaks in 44 countries (AFR: n = 34, EMR: n = 10), median response time was 89 (IQR: 106) days for the first and 147 (IQR: 127) days for the second SIA. Only 7 (11%) outbreaks had timely first and second SIAs. During 2021–2023, 27 outbreaks occurred, of which 2 (7%) had timely first, and 1 (4%) had timely second SIAs. During 2016–2020, 37 outbreaks occurred, of which 13 (35%) had timely first and 9 (24%) had timely second SIAs. To date, 17 (27%) outbreaks had a breakthrough virus, of which 3 (18%) had timely responses for both SIAs.

Conclusions: Outbreak response timeliness was inadequate and has decreased since 2020. Improving SIA timeliness is critical for promptly interrupting cVDPV transmission. Reasons for delayed SIA response must be explored and mitigated.

3:40 Fatal Orthopoxvirus Infection in an Immunosuppressed Hospitalized Patient — Alaska, 2023

Author: Julia H. Rogers, B. Westley, K.G. Newell, J. Laurance, A.K. Rao, A. McCollum, W. Davidson, W.C. Carson, M.B. Townsend, J.B. Doty, C.L. Hutson, Y. Li, K. Wilkins, J. Deng, C. Gigante, S.S. Panayampalli, A. Tuttle, J. Wright, L. Castrodale, J. McLaughlin

Background: Alaskapox virus (AKPV), a zoonotic orthopoxvirus, was discovered in 2015. Five cases have been previously identified; all were mild and occurred among residents of Alaska's Interior region. In December 2023, the Alaska Section of Epidemiology (SOE) was notified of a patient with chemotherapy-induced immunosuppression in Southcentral Alaska with a progressive axillary lesion, systemic illness, and a metagenomic diagnostic plasma test suggesting cowpox (an orthopoxvirus not endemic in the United States). We investigated to determine etiology of the patient's illness.

Methods: Lesion swabs were submitted to the Alaska State Public Health Laboratory for orthopoxvirus real-time polymerase chain reaction (PCR) testing. PCR-positive specimens were shipped to CDC for viral culture and genomic sequencing; sequences were compared with other AKPV isolates. Serum was tested by enzyme-linked-immunosorbent assay (ELISA). Investigational therapeutics used for other orthopoxvirus infections were prescribed. The patient was interviewed to ascertain recent travel history and animal exposures.

Results: Lesion swab PCR results were consistent with AKPV. The patient's sera, collected post-treatment, was positive for anti-orthopoxvirus IgG antibodies and negative for IgM. The genome sequence was phylogenetically distinct from previous AKPV isolates. Although the patient initially improved after treatment, he developed progressive malnutrition, delayed wound healing, acute renal failure, and hypoxic respiratory failure. He died 48 days after diagnosis. The patient resided alone in a remote forested area and reported no recent travel nor close contacts with recent travel, illness, or pox-like lesions. He reported caring for and being scratched by a stray cat but no other recent animal contact.

Conclusions: This investigation indicates AKPV is more widely endemic in Alaska than previously known and can cause life-threatening illness in immunosuppressed persons. Alaska clinicians should increase their awareness of AKPV clinical presentations and report suspected cases to SOE to facilitate access to testing and treatment.

3:50 Response to Measles in an International Traveler — Colorado, December 2023

Author: Cara C. Drehoff, M. Barnes, A. Metz, T. Mirassuo-Wolf, M. Adair, T. Appel

Background: Measles is a highly contagious viral disease characterized by a febrile rash but is preventable with vaccination. On December 18, 2023, an ill adolescent with unknown vaccination status traveling from an endemic country was triaged, isolated, and subsequently tested positive for measles by real-time polymerase chain reaction. During their infectious period, they visited the Denver International Airport, the Children's Hospital of Colorado (CHO), and attended a community gathering. Although ≥95% coverage is necessary for herd immunity, 2-dose measles-mumps-rubella vaccine (MMR) coverage among kindergarteners in Colorado during 2023 was 86.8%. Because of disease severity and limited vaccination coverage, preventing secondary cases was a priority.

Methods: Tracing was initiated, and exposed contacts were classified as immune, susceptible, unknown, or unknown but likely immune based on birth year, military service, or immigration status. The state health department supported local public health with cultural navigation to build trust with the affected community and provide measles and quarantine education in a culturally responsive manner. Postexposure prophylaxis with either MMR vaccination or immune globulin was offered by local public health and CHO to exposed contacts with susceptible or unknown immunity, and they were recommended for 21-day active symptom monitoring. On December 20, a state public health mobile unit tested and vaccinated household contacts, and a community site was used for a local public health MMR vaccination clinic.

Results: Public health, in collaboration with CHO, identified 313 exposed contacts among Coloradan and international residents; 195 were immune, 37 were susceptible, 19 had unknown status but were likely immune, 37 had unknown immunity, and 25 were lost to follow-up. Postexposure prophylaxis was administered to 54 persons; 12 received immune globulin and 42 MMR vaccine. No secondary cases were identified.

Conclusions: Rapid case detection and isolation, response, multi-jurisdictional coordination, and cultural navigation were successful in preventing measles spread.

4:00 Local Response to the First Case of Locally Acquired Dengue Infection in California — Pasadena, California, 2023

Author: Rudy Patrick, M. Oshiro, C. Sheridan, M. Kuan, S.Y. Tartof, M. Feaster

Background: Global incidence of dengue, a mosquito-borne arbovirus that can be fatal, is increasing. Vaccines and effective treatments remain limited. Most persons with dengue are asymptomatic, leading to undetected transmission and underreporting. Since 2013, the Pasadena Public Health Department (PPHD) has reported 6 travel-acquired dengue cases. On October 4, 2023, PPHD was notified of a patient with no travel history who was confirmed to have dengue (serotype DENV-1). This was the first confirmed locally acquired dengue case in California. We investigated to conduct additional case finding and prevent transmission.

Methods: During October 10–November 14, households ≤250 meters from the patient's house were each visited up to 4 times. Household-level interviews were conducted with 1 person from each household to identify any persons in the household with elevated dengue risk (ie, recent travel to dengue-endemic regions or recent arbovirus symptoms such as fever, fatigue, muscle or joint pain). We provided mosquito-reduction education to prevent additional transmission. Laboratory testing was offered to all members of households where elevated dengue risk was reported.

Results: Among 175 households identified, 130 (74.3%) interviews were completed, 14 (8.0%) declined, and 31 (17.7%) could not be reached. All households received educational materials. Twenty-four (19%) households had persons who reported elevated dengue risk (ie, recent travel to dengue-endemic regions [n = 17] or recent arbovirus symptoms [n = 9]). Six persons from 5 households had laboratory testing. One tested positive for dengue (DENV-1) and reported neither recent travel nor recent arbovirus symptoms.

Conclusions: We identified 2 locally acquired dengue cases in California. We are testing stored blood samples from patients from 2 local healthcare networks to potentially identify asymptomatic persons with dengue, which might indicate additional local transmission. This information will guide future vector control and arboviral prevention efforts in Pasadena.

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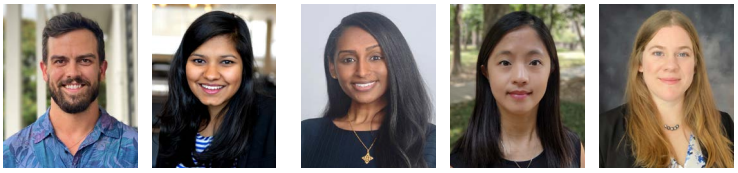
Bastani, Parsa, PhD, MPH, MA, AB - CDC GHC



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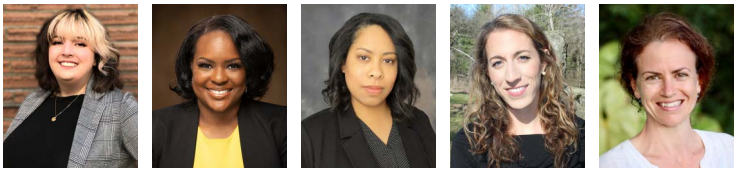

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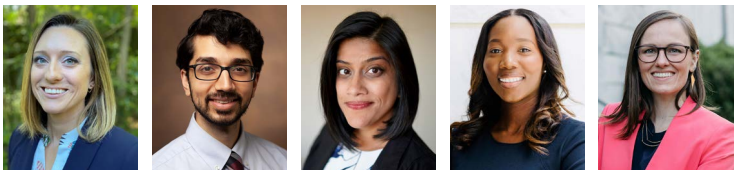
Cash-Goldwasser, Shama, MDCM, MPH, BA - Minnesota DOH



Chapman, Kelly, PhD, MA, MPH, BA - CDC GHC
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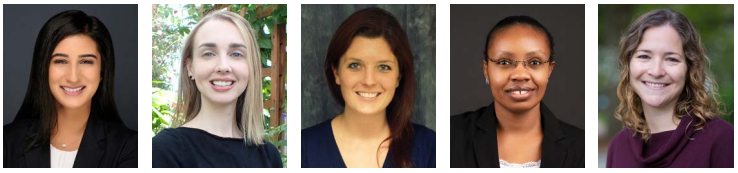
Esie, Precious, PhD, MPH, BS - Washington Public Health - Seattle & King County
Faherty, Emily, PhD, MA, BA - Chicago DOPH



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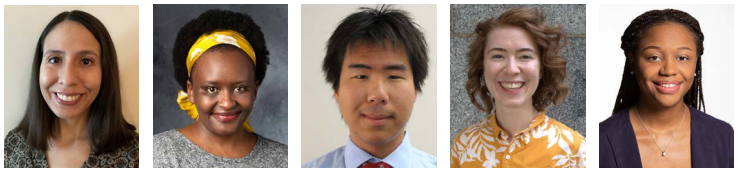

Kava, Christine (Marie), PhD, MA, BA - CDC NCCDPHP
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Kojima, Noah, MD, BS - CDC NCIRD
Labgold, Catherine, PhD, MPH, BA - U.S. Virgin Islands DOH
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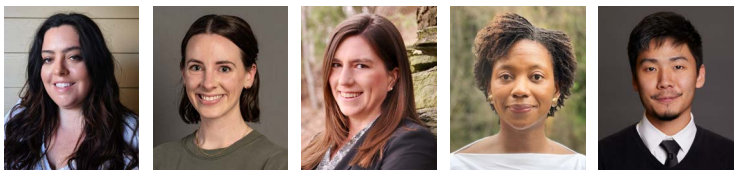

Lamb, Gabriella, MD, MPH, BA - CDC NCEZID
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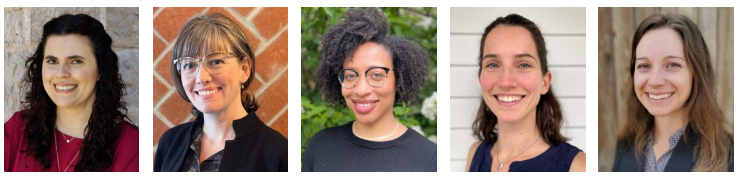
Lee, Scarlett, DVM, PhD, BS - CDC GHC
Lindsay, Keisha, PhD, MA, BS - CDC NCIPC
Ma, Kevin, PhD, BA - CDC NCIRD



Madera, Valerie Garcia, PhD, MPH, BS - CDC NCHHSTP
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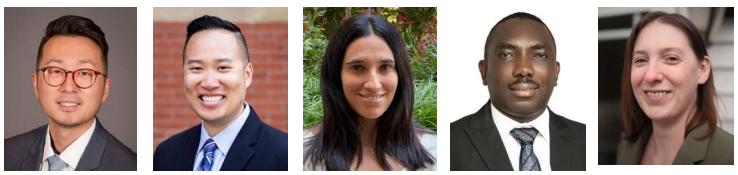

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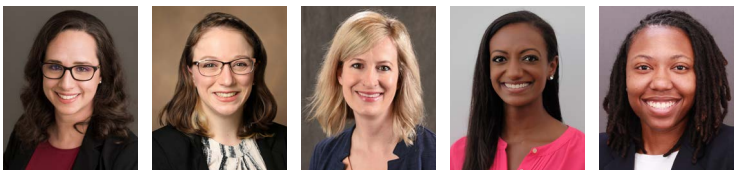

Saunders, Katharine, DNP, MPH, BSN, BS - Florida DOH
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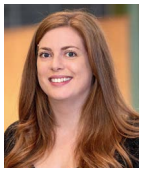


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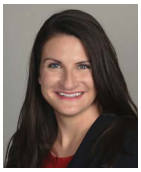


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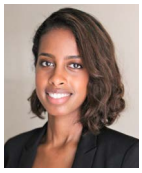

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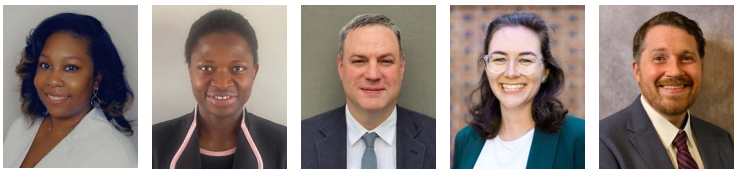
Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry
CDC	Centers for Disease Control and Prevention
CHD	County Health Department
CHHS	County Health and Human Services
DFSPHL	Department of Forensic Sciences Public Health Laboratory
DOH	Department of Health
DOHS	Department of Health Services
DOHEC	Department of Health and Environmental Control
DOHMH	Department of Health and Mental Hygiene
DOHS	Department of Health and Social Services
DPH	Department of Public Health
DPHED	Department of Public Health and Environment
DSHS	Department of State Health Services
GHC	Global Health Center
IHB	Indian Health Board
NCBDDD	National Center on Birth Defects and Developmental Disabilities
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCEZID	National Center for Emerging and Zoonotic Infectious Diseases
NCEH	National Center for Environmental Health
NCIRD	National Center for Immunization and Respiratory Diseases
NCHHSTP	National Center for HIV, Viral Hepatitis, STD, and TB Prevention
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
NIOSH	National Institute for Occupational Safety and Health
OHE	Office of Health Equity
OPHDST	Office of Public Health Data, Surveillance, and Technology
ORR	Office of Readiness and Response
PHD	Public Health Department

LLS Fellows–Class of 2022



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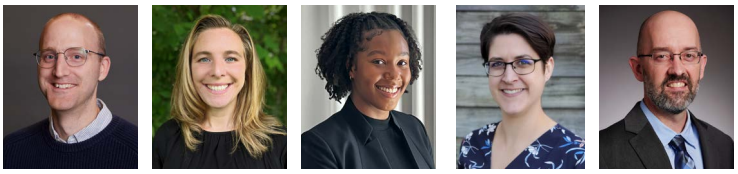

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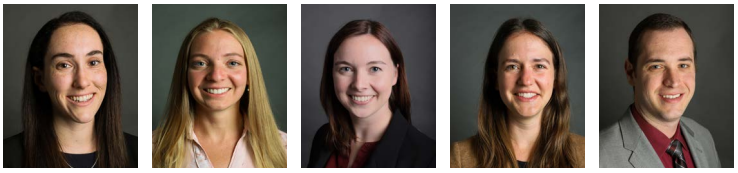

Balta, Victoria, PhD, MPH — CDC NCEZID
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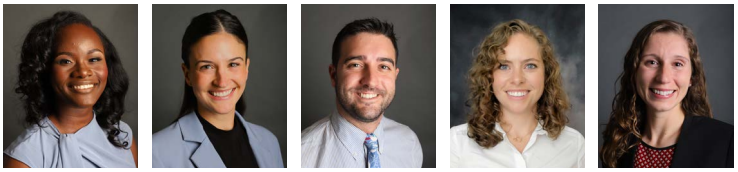
Barrall, Angelica, PhD, MPH — CDC NCEZID
Beard, Cynthia, PhD, MPH — Field: Nevada
Braunfeld, Jordan, MD — Field: Los Angeles Co.



Brown, Andrea Danielle, PhD, MPH — CDC NCCDPHP
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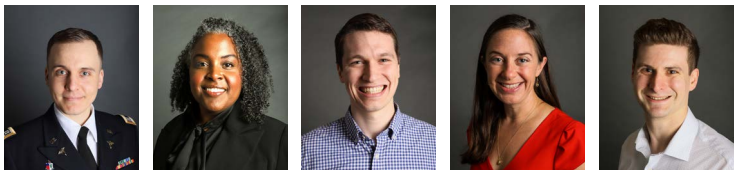
DeVita, Timothy, MD — CDC NCEZID
Dorris, Megan, MMS, MPH — CDC NCEZID
Drehoff, Cara, DVM, MPH — Field: Colorado



Emmerich, Samuel, DVM — CDC NCHS
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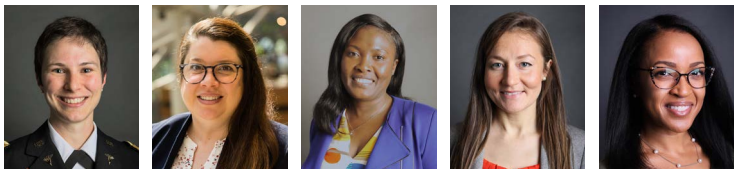
Frutos, Aaron, PhD, MPH — CDC NCIRD
Geiger, Karen, PhD, BSN — CDC GHC
Gowler, Camden, PhD — Field: North Carolina



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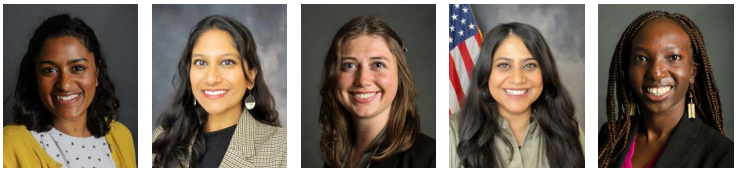
Jones, Camille, PhD, MPH — CDC GHC



Jose, Rini, PhD, MPH — CDC NCHHSTP
Kache, Pallavi, PhD, MPH — CDC NCEZID
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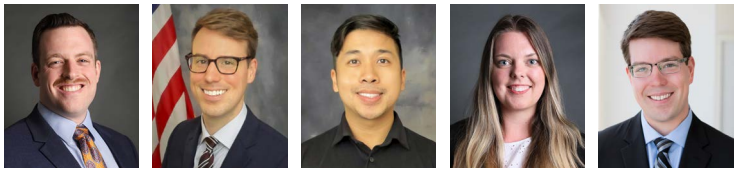
Khan, Sana, PhD, MPH — Field: Alameda County
Kiplagat, Sandra, PhD, MS — CDC NCEZID



Lambert, Matthew, MD — Field: Connecticut
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Le, John, PharmD — CDC NCHHSTP
Ledford, Savanna, DrPH, MS — Field: Arkansas
Leonard, Jerome, MD, MPHTM — CDC NCCDPHP

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Lundstrom, Eric, PhD, MPH — CDC NIOSH
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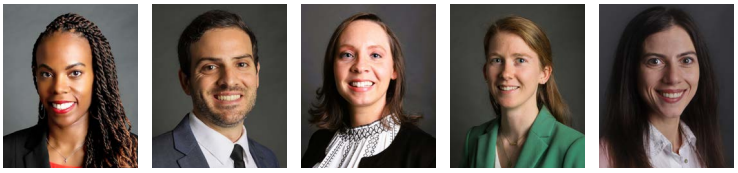
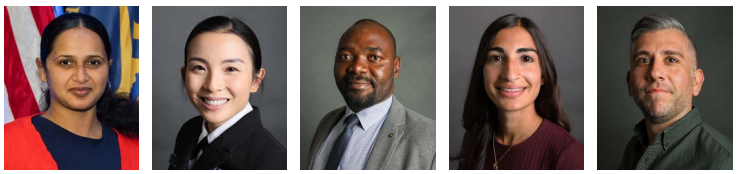
McElroy, Roisin, MD, MPH — Field: New York City

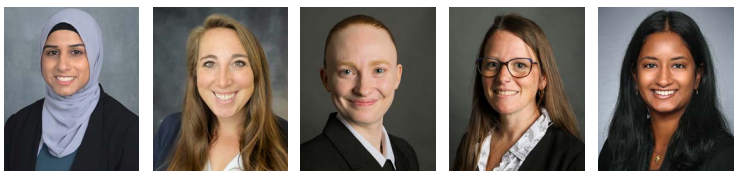


McKinney, Kimberly, MD, MPH — CDC NCEZID
Molinari, Alexander, DO, MPH — CDC NCCDPHP
Moore, Tori, DVM, MPH, DACVPM — Field: South Carolina
Moran, Mary, PhD, MPH — CDC NCIRD
Mouhanna, Farah, PhD, MS — CDC NCCDPHP

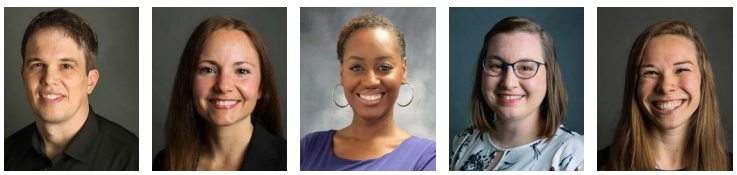


Naraharisetti, Ramya, PhD — Field: Michigan
Nham, Amy, PharmD, MPH — Field: Chicago
Nyika, Ponesai, MBChB, MPH — CDC NCIRD
Padda, Hannah, DVM, MPH — CDC NCEZID
Patrick, Rudy, PhD, MPH — Field: Kaiser Permanente So Cal and Pasadena

Polter, Elizabeth, PhD, MPH — Field: Wisconsin
Ramachandran, Veena, MD, MPH — CDC
Rogers, Courtney, PhD, MPH — CDC OHE
Rogers, Julia, PhD, MPH — Field: Alaska
Rumph, Jelonia, PhD — CDC NCEH



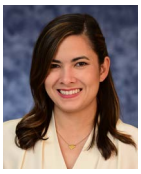
Saif, Nadia, MD, MPH, MS — CDC NIOSH
Sajewski, Elizabeth, PhD, MS — CDC NCEZID
Schappert, Alexa, DVM, MPH — Field: Kansas
Sherman, Jessica, PhD, MSN — CDC ORR
Singichetti, Bhavna, PhD, MPH — CDC NCIPC



Singleton, Jordan, MD — CDC NCIRD
Smith, Kami, MD, MPH — CDC NCEZID
Staley, Brooke, PhD, MPH — CDC NCBDDD
Stein, Sydney, DVM, MPH — Field: Nebraska
Strelau, Katherine, PhD — Field: Vermont

Sutter, Rebekah, MPH, BSN — CDC NCEZID
Swift, Bethan, DPhil, MSc — Field: Riverside Co.
Swisher, Samantha, DVM, MPH — CDC NCEZID
Tangney, Sylvia, PhD, MPH — CDC NCIRD
Thomas, Shawn, PhD, MPH — CDC NCBDDD

EIS Officers–Class of 2023





Thompson, Julie, PhD, DVM, MPH — CDC NCEZID
Vachon, Madhura, PhD, MPH — CDC NCIRD
Valenzuela Lara, Marisol, PhD, MD, MPH — CDC ATSDR
Walker, Heather, DVM, MPH — Field: Maricopa Co. and Arizona
Walton, Madison, PhD — Field: Oregon and Multnomah Co.





Wang, Dennis, MD, MPH — CDC NCIRD
Waranius, Brittney, DVM, MPH, MA — Field: Wyoming
Ware-Gilmore, Fhallon, PhD — Field: Puerto Rico
Wendt, Elizabeth, MD, MPH — CDC NCEZID
Williams, Paula, DrPH, MPH — CDC NCHHSTP





Xie, Amy, MD — Field: Seattle & King County
Yomogida, Kyle, PhD — Field: Washington State
Zecca, Italo, PhD, MPH — CDC NCEZID
Zeno, Erica, PhD, MPH — CDC NCIRD
Zhao, Sifang Kathy, PhD, MPH — CDC NCCDPHP

Zhu, Sophie, PhD — Field: California

LLS Fellows–Class of 2023

Hadj Aoued, DVM, MS
LLS Fellow
Center for Global Health/Division of Parasitic Diseases and Malaria/Parasitic Diseases Branch

Blake Bertrand, PhD
LLS Fellow
Georgia Department of Public Health

Nicole Bowen, PhD
LLS Fellow
National Center for Immunization and Respiratory Diseases/Coronavirus and Other Respiratory Viruses Division

Hans Desale, PhD, MPHTM
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of Vector-Borne Diseases

Zachary Ende, PhD
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of Foodborne, Waterborne and Environmental Diseases

Nina Grossman, PhD
LLS Fellow
New York City Department of Health and Mental Hygiene

Luis Antonio Haddock-Soto, PhD, MSc
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of High Consequence Pathogens & Pathology

Lindsay Hein, PhD
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of High Consequence Pathogens & Pathology

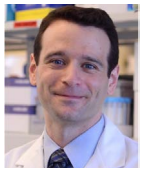
Frances Knight, PhD, MSc
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of Healthcare Quality Promotion

Sonni-Ali Miller, PhD, MS
LLS Fellow
District of Columbia Department of Forensic Sciences Public Health Laboratory

Lindsay Nyhoff, PhD
LLS Fellow
National Center for Environmental Health/ Division of Laboratory Science

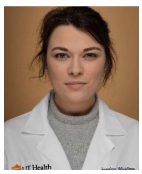
Jordan Prahl, PhD
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of High Consequence Pathogens & Pathology

Annie Sanchez, PhD
LLS Fellow
Wisconsin State Laboratory of Hygiene



Gregory Sousa, VMD, PhD
LLS Fellow
Minnesota Department of Health

Kevin Tsai, PhD, MPH
LLS Fellow
National Center for Emerging and Zoonotic Infectious Diseases/Division of High Consequence Pathogens & Pathology



Jessica Wickline, PhD
LLS Fellow
Iowa State Hygienic Laboratory

Incoming EIS Officers–Class of 2024

AVNIKA AMIN

SU AUNG

DANIEL BAKER

JULIA BENNETT

KATHERINE CAMPBELL

NAOMI LOPEZ CARABALLO

RACHEL CASTILLO

MICHELLE CHANG

REBECCA EARNEST

KERRY GAINOR

SARAH GALLALEE

ELIZABETH GARCIA

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ARIANA GOBAUD

DANIEL GORE

DOMONIQUE HARGRAVE

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NDEY BASSIN JOBE

RUGIATU KAMARA

DUMBANI KAYIRA

MOLLIE KILLION

KATIE LEE

ALESSANDRA LOCHEN

ANH LY

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DUDUZILE "PHINDI" MASHININ

THOMAS MCHALE

KATHERINE MCNABB

ROCHELLE MEDFORD

GEOFFREY MELLY

STEPHEN MUGEL

TANVIBEN PATEL

EMILIA PAWLOWSKI

TWYLA PERRYMAN

LAURA PLATT

NIKHIL RANADIVE

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SAVANAH RUSS

NIMIT SHAH

MILA SHAKYA

EMILY SILVA

JOE SILVA

RYAN SNEAD

ASHLEY TSENG

MAI VANG

AISLING VAUGHAN

CHRISTINE "ANNIE" WANG

HAILEY WHITMIRE

RAJESH YADAV

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SERENA ZHAO

Incoming LLS Fellows—Class of 2024

Derek Dang
Dali Davis
Cassandra Field
Maurice Itoe
Leandra Jones
Natalie Rose
Mareena Pitts
Mitchell Ramuta
Madelaine Usey


CDC
U.S. CENTERS FOR DISEASE
CONTROL AND PREVENTION