# Research Update

## 2024 Vol. 1

A semi-annual look at select DLH research activities.

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I am happy to share 2024 Vol. 1 of the DLH Research Update, a semiannual look at select research activities from across our company.

This year has been full of significant accomplishments and important progress within our team. The team has been working diligently to advance life-changing work in research, science, and public health. This update shares our most recent publications and highlights our research initiatives that are driving movement that will better communities across the globe.

Our researchers demonstrate the highest level of commitment to improving the health outcomes of the communities in which we live and work. Their innovative approaches and groundbreaking studies continue to provide meaningful insights that are shaping the future of public health. Our staff looks to tackle disparities in reproductive health care and HIV treatment. We push toward breakthroughs in diabetes prevention and management and discover health inequities relating to food insecurity. We delve into key data-driven insights and innovative methodologies aimed at enhancing the overall well-being of the populations we serve.

I take great pride in seeing our team push the boundaries of knowledge to better understand critical health challenges. The landscape of public health is constantly evolving, and I remain inspired by our team's dedication to confronting these changes and challenges to drive positive health outcomes. I want to thank our staff for being an integral part of making strides toward a healthier and more equitable future. Your passion is making a real difference in the lives of many.

Sincerely,

## Jeanine Christian

President
Public Health & Scientific Research

**Safety and Immune Responses Following Anti-PD-1 Monoclonal Antibody Infusions in Healthy Persons with Human Immunodeficiency Virus on Antiretroviral Therapy**
DLH researcher and clinical trials specialist **Chanelle Wimbish** was among the authors of an article published in *Open Forum Infectious Diseases* (Online: January 2024). T cells in people with human immunodeficiency virus (HIV) demonstrate an exhausted phenotype, and HIV-specific CD4+ T cells expressing programmed cell death 1 (PD-1) are enriched for latent HIV, making antibody to PD-1 a potential strategy to target the latent reservoir. This was a phase 1/2, randomized, double-blind, placebo-controlled study in adults with suppressed HIV on antiretroviral therapy with CD4+ counts ≥350 cells/μL who received two infusions of cemiplimab versus placebo. The primary outcome was safety, defined as any Grade 3 or higher adverse event (AE) or any immune-related AE (irAE). Five men were enrolled; 2 received 1 dose of cemiplimab, 2 received 2 doses of cemiplimab, and 1 received placebo. One participant had a probable irAE (thyroiditis, Grade 2); another had a possible irAE (hepatitis, Grade 3), both after a single low-dose infusion. The Safety Monitoring Committee recommended no further enrollment or infusions. All four cemiplimab recipients were followed for 48 weeks. No other cemiplimab-related serious AEs, irAEs, or Grade 3 or higher AEs occurred. One of four participants exhibited increased HIV-1-specific T-cell responses and transiently increased HIV-1 expression following two cemiplimab infusions. The occurrence of irAEs after a single, low dose may limit translating the promising therapeutic results of cemiplimab for cancer to immunotherapeutic and latency reversal strategies for HIV. *Other authors include researchers from the University of North Carolina at Chapel Hill, Harvard T. H. Chan School of Public Health, Johns Hopkins University School of Medicine, and the Division of AIDS from the National Institute of Allergy and Infectious Diseases.*

**FiPhA: An Open-Source Platform for Fiber Photometry Analysis**
DLH researchers **Matthew Bridge** and **Sandra McBride** were among the authors of an article published in *Neurophotonics* (Online: January 2024). Fiber photometry (FP) is a widely used technique in modern behavioral neuroscience, employing genetically encoded fluorescent sensors to monitor neural activity and neurotransmitter release in awake-behaving animals. However, analyzing photometry data can be both laborious and time-consuming. The authors proposed the fiber photometry analysis (FiPhA) app, which is a general-purpose FP analysis application. The goal is to develop a pipeline suitable for a wide range of photometry approaches, including spectrally resolved, camera-based, and lock-in demodulation. FiPhA was developed using the R Shiny framework and offers interactive visualization, quality control, and batch processing functionalities in a user-friendly interface. This application simplifies and streamlines the analysis process, thereby reducing labor and time requirements. It offers interactive visualizations, event-triggered average processing, powerful tools for filtering behavioral events, and quality control features. FiPhA is a valuable tool for behavioral neuroscientists working with discrete, event-based FP data. It addresses the challenges associated with analyzing and investigating such data, offering a robust and user-friendly solution without the complexity of having to hand-design custom analysis pipelines. This application thus helps standardize an approach to FP analysis. *Other authors include researchers from the National Institute of Environmental Health Sciences.*

**Air Pollutants and Risk of Parkinson's Disease Among Women in the Sister Study**
DLH researcher **Aimee D'Aloisio** was among the authors of an article published in *Environmental Health Perspectives* (Online: January 2024). Air pollutants may contribute to the development of Parkinson's disease (PD), but empirical evidence is limited and

inconsistent. This study aimed to prospectively investigate the associations of PD with ambient exposures to fine particulate matter with aerodynamic diameter ≤2.5 µm (PM2.5) and nitrogen dioxide (NO2). The authors analyzed data from 47,108 US women from the Sister Study, enrolled from 2003-2009 (35-80 years of age) and followed through 2018. The primary outcome was PD diagnosis between 2009 and 2018 (n=163). NO2 exposure in 2009 was associated with PD risk in a dose-response manner. The HR and 95% CI were 1.22 for one interquartile increment in NO2, adjusting for age, race and ethnicity, education, smoking status, alcohol drinking, caffeine intake, body mass index, physical activity, census region, residential area type, area deprivation index (ADI), and self-reported health status. Post hoc subgroup analyses overall confirmed the association. However, statistical interaction analyses found that the positive association of NO2 with PD risk was limited to women in urban, rural, and small town areas and women with ≥50th percentile ADI but not among women from suburban areas or areas with <50th percentile ADI. In contrast, PM2.5 exposure was not associated with PD risk with the possible exception for women from the Midwest region of the US but not in other census regions. In this nationwide cohort of US women, higher level exposure to ambient NO2 is associated with a greater risk of PD. This finding needs to be independently confirmed and the underlying mechanisms warrant further investigation. *Other authors include researchers from Michigan State University College of Human Medicine and the National Institute of Environmental Health Sciences.*

**Body Mass Index and Uterine Fibroid Development: A Prospective Study**
DLH researcher **Sheri Denslow** was among the authors of an article published in the *Journal of Clinical Endocrinology and Metabolism* (Online Ahead of Print: January 2024). Fibroids are hormonally dependent uterine tumors. The literature on adiposity and fibroid prevalence is inconsistent. Previous work usually combined all those with body mass indexes (BMIs) ≥30 kg/m2 into a single category and relied on clinically diagnosed fibroids which misclassifies the many women with undiagnosed fibroids. The authors used a prospective cohort design with periodic ultrasound screening to investigate associations between repeated measures of BMI and fibroid incidence and growth assessed at each follow-up ultrasound. The Study of Environment, Lifestyle & Fibroids (SELF) followed 1,693 Black/African American women, ages 23-35 from Detroit, Michigan, with ultrasound every 20 months for 5 years. Measured height and repeated weight measures were used to calculate BMI. Fibroid incidence was modeled using Cox models among those who were fibroid-free at the enrollment ultrasound. Fibroid growth was estimated for individual fibroids matched across visits as the difference in log-volume between visits and was modeled using linear mixed models. All models used time-varying BMI and adjusted for time-varying covariates. Compared to BMI <25 kg/m2 those with BMI 30-<35 kg/m2 had increased fibroid incidence, those with BMI ≥40 kg/m2 had reduced incidence. Fibroid growth had mostly small magnitude associations with BMI. BMI has a non-linear association with fibroid incidence that could be driven by effects of BMI on inflammation and reproductive hormones. More detailed measures of visceral and subcutaneous adiposity and their effects on hormones, DNA damage, and cell death are needed. *Other authors include researchers from the National Institute of Environmental Health Sciences and the Department of Public Health Sciences at Henry Ford Health in Detroit.*

**Age- and Race-Specific Changes in ESKD Incidence Over Four Decades**
DLH researchers **Chyng-Wen Fwu** and **Kara Bennett** were among the authors of an article published in the *Journal of the American Society of Nephrology* (Epub: January 2024; Print: April 2024). ESKD incidence has changed substantially in the past four decades, but differences by age and race have been unexplored. Using data from the United States

Renal Data System, the authors found that ESKD incidence rose for Black and White teenagers, adults, and older adults for two decades beginning in 1980. Growth in incidence slowed for most groups by 1993, and by 2006, the annual percent change (APC) in ESKD incidence had declined for all groups, except White adults, for whom rates continued to rise. By 2019, ESKD incidence among Black and White adolescents nearly returned to 1980 levels, but no other group achieved that degree of improvement. Nonetheless, the ESKD incidence rate among Black American patients exceeds that of White patients in every age group. Distinct patterns in ESKD incidence among patients of different age, sex, and racial groups are shown. These findings could reflect changes in dialysis acceptance rates, access to preventive health care, incidence of diabetes mellitus, implementation of evidence-based guidelines for treatment of CKD, or other unrecognized factors. There may be population-specific opportunities to change the growth of the US ESKD population and address current racial disparities. Substantial changes in ESKD incidence over four decades among Black and White Americans of different ages have been incompletely explored. The authors analyzed United States Renal Data System data from 1980 to 2019 to determine ESKD incidence trends among Black and White adolescent (13-17 years), adult (18-64 years), and older adult (≥65) populations. The National Cancer Institute Joinpoint Regression Program was used to estimate annual percent change (APC) in ESKD incidence and to define points in time where a statistically significant change in APC slope occurred for each group. *Other authors include researchers from the National Institute of Diabetes and Digestive and Kidney Diseases.*

**Features of the Physical and Social Neighborhood Environment and Neighborhood-Level Alzheimer's Disease and Related Dementia in South Carolina**

DLH researchers **Gary Larson**, **Frankie LaPorte**, **W. Braxton Jackson II**, and **Nathaniel MacNell** were among the authors of an article published in *Environmental Health Perspectives* (Online: February 2024). Studies are increasingly examining the relationship between the neighborhood environment and cognitive decline; yet, few have investigated associations between multiple neighborhood features and Alzheimer's disease and related dementias (ADRD). The authors investigated the relationship between neighborhood features and ADRD cumulative incidence from 2010 to 2014 in the South Carolina Alzheimer's Disease Registry (SCADR). Diagnosed ADRD cases ≥50 years of age were ascertained from the SCADR by ZIP code and census tract. Neighborhood features from multiple secondary sources included poverty, air pollution, and rurality at the census-tract level and access to healthy food, recreation facilities, and diabetes screening at the county level. The average annual ADRD cumulative incidence was 690 per 100,000 people per census tract. The analysis was limited to 98% of South Carolina census tracts and to residents over age 50. Compared to large urban census tracts, rural and small urban tracts had 10% and 5% higher ADRD, respectively. For every percent increase in the number of county residents with limited access to healthy food, ADRD was 2% higher. Neighborhood environment features, such as higher air pollution levels, were associated with higher neighborhood ADRD incidence. The paper exemplifies the applicability of the INLA-SPDE statistical estimation method to data collected across disparate spatial scales. *Other authors include researchers from the National Institute of Environmental Health Sciences, the Arnold School of Public Health at the University of South Carolina, and the National Institute on Minority Health and Health Disparities.*

**Food Security Status and Cardiometabolic Health Among Pregnant Women in the United States**

DLH researchers **Christopher Payne** and **W. Braxton Jackson II** were among the authors of an article published in *Frontiers in Global Women's Health* (Online: February 2024). Pregnant women and their offspring are particularly vulnerable to food insecurity and

its adverse effects during critical periods of fetal development. Racially/ethnically minoritized women in the United States (US) who are pregnant are additionally burdened by food insecurity, which may exacerbate cardiovascular health (CVH) disparities. Despite heightened social vulnerability, few studies have employed an intersectional framework, including race and gender, to assess the food insecurity and CVH relationship. The authors used 2012-2018 and 2020 National Health Interview Survey data among US pregnant women aged 18-49 years old (N = 1,999) to assess the prevalence of food insecurity status by race/ethnicity and to investigate household food security status in relation to ideal CVH. Food security status was categorized as "very low/low," "marginal," or "high." Among pregnant women, 12.7% reported "very low/low," 10.6% reported "marginal," and 76.7% reported "high" food security. "Very low/low" food security prevalence was higher among NH-Black (16.2%) and Hispanic/Latina (15.2%) pregnant women compared to NH-White (10.3%) and NH-Asian (3.2%) pregnant women. Among all pregnant women, "very low/low" and "marginal" versus "high" food security status was associated with a lower prevalence of modified ideal CVH (mICVH). Household food insecurity was higher among pregnant women in minoritized racial/ethnic groups and was associated with lower mICVH prevalence. Given the higher burden of food insecurity among minoritized racial/ethnic groups, food security may be an important intervention target to help address disparities in poor CVH among pregnant women. *The other authors are researchers from the National Institute of Environmental Health Sciences and the National Institute on Minority Health and Health Disparities.*

**Explaining Racial and Ethnic Disparities in Antiretroviral Therapy Adherence and Viral Suppression Among U.S. Men Who Have Sex With Men**

DLH researcher **Xin Yuan** was among the authors of an article published in *AIDS (London, England)* (Epub: February 2024; Print: June 2024). The study objectives were to identify factors—including social determinants of health (SDOH)—that explain racial/ethnic disparities in antiretroviral therapy (ART) adherence and sustained viral suppression (SVS) among U.S. men who have sex with men (MSM) with HIV. The authors used weighted data from 2017 to 2021 cycles of the Medical Monitoring Project. Among MSM taking ART, prevalence differences (PDs) were calculated with 95% confidence intervals (CIs) of ART adherence and SVS for Black MSM (BMSM) and Hispanic/Latino MSM (HMSM) compared with White MSM (WMSM). After adjusting for age, any unmet service need, federal poverty level (FPL), food insecurity, homelessness, time since HIV diagnosis, gap in health coverage, and education, the BMSM/WMSM PD for ART adherence reduced from -16.9 to -8.2 (51.5%). For SVS, the BMSM/WMSM PD reduced from -8.3 to -3.6 (56.6%) after adjusting for ART adherence, age, homelessness, food insecurity, gap in health coverage, FPL, any unmet service need, time since diagnosis, and ER visit(s). The HMSM/WMSM PD for ART adherence reduced from -9.3 to -2.9 (68.8%) after adjusting for age and FPL. Adjusting for SDOH and other factors greatly reduced racial/ethnic disparities in ART adherence and SVS. Addressing these factors—particularly among BMSM—could substantially improve health equity among MSM with HIV. *The other authors are researchers from the Centers for Disease Control and Prevention.*

**Prevented Perinatal HIV Infections in the Era of Antiretroviral Prophylaxis and Treatment, United States, 1994-2020**

DLH researcher **Alexis Henderson** was among the authors of an article published in the *International Journal of Gynaecology and Obstetrics* (Online Ahead of Print: February 2024; Print: July 2024). The primary aim of this serial cross-sectional analysis is to estimate the total number of prevented perinatal HIV transmissions from the time of

the initial recommendation for perinatal zidovudine prophylaxis in 1994 through 2020 in the US. The estimated number of prevented transmissions was calculated as annual differences between expected and observed numbers of perinatal HIV transmissions. Annual expected number of transmissions was estimated by multiplying the annual number of births to women with HIV by 0.2255 (22.55%). The authors used published point estimates or, if only ranges were given, the midpoints of those ranges as the best estimates of the annual numbers of births to women with HIV and infants with perinatal HIV. When data were not available, the authors linearly interpolated or extrapolated the available data to obtain estimated numbers for each year. Between 1978 and 2020, the approximate number of live births to women with HIV was 191,267 and for infants with diagnosed perinatal HIV, it was 21,379. Since 1994, the annual number of infants born with HIV decreased from 1,263 to 33 in 2019 and 36 in 2020, corresponding to a 97% reduction. Cumulatively, an estimated total of 22,732 perinatal HIV infections were prevented from 1994 through to 2020. The elimination of perinatal HIV transmission-accompanied by the cumulative number of prevented cases exceeding that of perinatal HIV infections-is a major public health achievement in the US. *The other authors are researchers from the Centers for Disease Control and Prevention.*

**Prevalence and Determinants of Minimum Dietary Diversity for Women of Reproductive Age in Uganda**

DLH researchers **Derrick Kimuli**, **Florence Nakaggwa**, **Norah Namuwenge**, **Rebecca Nsubuga**, **Kenneth Kasule**, **Jimmy Odong**, **Paul Isabirye**, **Fatuma Matovu**, **Bonnie Wandera**, **Barbara Amuron**, and **Daraus Bukenya** were among the authors of an article published in *BMC Nutrition* (Online: March 2024). Globally, over a billion women of reproductive age (WRA) suffer from some kind of undernutrition micronutrient deficiency and/or anemia as a result of inadequate dietary diversity. This leads to poor maternal and child health outcomes especially in developing countries, however, there is limited research on population level research on minimum dietary diversity for women (MDD-W). This study assessed the prevalence and predictors of MDD-W among WRA in Uganda using a secondary analysis of data from the lot quality assurance sampling (LQAS) survey conducted across 55 Ugandan districts between May and September 2022. Women of various ages were interviewed across 5 study subgroups that this study used to construct its study population (WRA). Responses from 29,802 WRA with a mean age of 27.8 (±6.8) years were analyzed. Only 8.8% achieved the MDD-W; the least proportion was observed in the South-Central region. In the adjusted analysis, WRA who were older than 25 years, had secondary education or above, and used modern contraceptives were more likely to achieve the MDD-W. Conversely, WRA who travelled longer distances to the nearest household water source and those residing in larger households were less likely to achieve the MDD-W. A low proportion of WRA met the MDD-W. Age, education level, household sizes, and use of modern contraception were predictors of MDD-W among WRA in Uganda. MDD-W-related interventions in Uganda should strengthen multisectoral collaboration with prioritization of younger women, improving education, larger household sizes, and improving access to safe water sources. *The authors are researchers from the United States Agency for International Development Strategic Information Technical Support Activity and United States Agency for International Development Uganda in Kampala, Uganda.*

**Data Linkages for Wildfire Exposures and Human Health Studies: A Scoping Review**

DLH researchers **Jacqueline Barkoski**, **Erin Van Fleet**, and **Steve Ramsey** were among the authors of an article published in *GeoHealth* (Online: March 2024). Wildfires are a growing

public health concern, and exposures to wildfire smoke have been linked to adverse health outcomes such as asthma and cardiovascular events. The research team conducted a scoping review to: (a) understand wildfire-related health effects, (b) identify and describe environmental exposure and health outcome data sources used to research the impacts of wildfire exposures on health, and (c) identify gaps and opportunities to leverage exposure and health data to advance research. The literature search was conducted in PubMed and a sample of 83 articles met inclusion criteria. Most studies focused on respiratory and cardiovascular outcomes. Hospital administrative data was the most common health data source, followed by government data sources and health surveys. Wildfire smoke, specifically fine particulate matter (PM2.5), was the most common exposure measure and was predominantly estimated from monitoring networks and satellite data. Health data were not available in real-time, and they lacked spatial and temporal coverage to study health outcomes with longer latency periods. Exposure data were often available in real-time and provided better temporal and spatial coverage but did not capture the complex mixture of hazardous wildfire smoke pollutants nor exposures associated with non-air pathways such as soil, household dust, food, and water. This scoping review of the specific health and exposure data sources used to underpin these studies provides a framework for the research community to understand: (a) the use and value of various environmental and health data sources, and (b) the opportunities for improving data collection, integration, and accessibility to help inform our understanding of wildfires and other environmental disasters. *Other authors include researchers from the National Institute of Environmental Health Sciences and the National Institute on Aging.*

**Access to High-Resolution Anoscopy Among Persons With HIV and Abnormal Anal Cytology Results**

DLH researcher **Xin Yuan** was among the authors of an article published in *JAMA Network Open* (Online: March 2024). This cross-sectional study evaluates use and availability of follow-up anoscopy among persons at highest risk for anal cancer. National guidelines recommend that anal cytology should not be performed without the ability to refer for high-resolution anoscopy (HRA), but the authors found that a substantial number of persons with HIV (PWH) at highest risk of anal cancer may not have access to HRA on-site or by referral at their HIV care facility. With anal cancer prevention by diagnosis and treatment of cancer precursors now demonstrated, improvements in screening and early detection, including systematic monitoring of such efforts, are needed. Improvements may include expanded HRA training or certification, modified patient care workflow to encourage clinicians to perform or refer for screening, and increased education and awareness about symptoms among patients and clinicians. Anal cancer disproportionately affects subpopulations in regions with lower socioeconomic status. If screening or prevention improvements are not equitably implemented, they can increase rather than reduce disparities. Study limitations include HRA availability data reported by facility staff, which might be subject to information bias. Additionally, some participants might have had cytology at facilities other than those that were analyzed; however, less than 10% of participants reported receiving HIV care at more than 1 facility. Finally, cytology results among all PWH at highest risk may differ from those who were actually tested. This study's nationally representative estimates can inform large-scale implementation of anal cancer prevention efforts. Given the limited supply of clinicians who can perform HRAs and the number of potentially HRA-eligible persons, HRA capacity may be the rate-limiting factor in precancer treatment among PWH. *The other authors include researchers from the Centers for Disease Control and Prevention.*

**Sexual and Reproductive Health Among Cisgender Women With HIV Aged 18-44 Years**
DLH researcher **Jen-Feng Lu** was among the authors of an article published in the *American Journal of Preventive Medicine* (Online Ahead of Print: March 2024; Print: July 2024). The sexual and reproductive health of cisgender women with HIV is essential for overall health and well-being. Nationally representative estimates of sexual and reproductive health outcomes among women with HIV were assessed in this study. Data from the Centers for Disease Control and Prevention's Medical Monitoring Project—including data on sexual and reproductive health—were collected during June 2018-May 2021 through interviews and medical record abstraction among women with HIV and analyzed in 2023. Overall, 86.4% of women with HIV reported receiving a cervical Pap smear in the past 3 years; 38.5% of sexually active women with HIV had documented gonorrhea, chlamydia, and syphilis testing in the past year; 88.9% of women with HIV who had vaginal sex used ≥1 form of contraception in the past year; and 53.4% had ≥1 pregnancy since their HIV diagnosis-of whom 81.5% had ≥1 unintended pregnancy, 24.6% had ≥1 miscarriage or stillbirth, and 9.8% had ≥1 induced abortion. Some sexual and reproductive health outcomes were worse among women with certain social determinants of health, including women with HIV living in households <100% of the federal poverty level compared with women with HIV in households ≥139% of the federal poverty level. Many women with HIV did not receive important sexual and reproductive health services, and many experienced unintended pregnancies, miscarriages/stillbirths, or induced abortions. Disparities in some sexual and reproductive health outcomes were observed by certain social determinants of health. Improving sexual and reproductive health outcomes and reducing disparities among women with HIV could be addressed through a multipronged approach that includes expansion of safety net programs that provide sexual and reproductive health service coverage. *The other authors are researchers from the Centers for Disease Control and Prevention.*

**Self-Rated Health and HIV Outcomes Among Adults with Diagnosed HIV — Medical Monitoring Project, United States**
DLH researcher **Xin Yuan** was among the authors of an article published in *AIDS (London, England)* (Epub: March 2024; Print: July 2024). The study objectives were to evaluate associations between self-rated health (SRH) and care outcomes among United States adults with diagnosed HIV infection. The authors analyzed interview and medical record data collected during June 2020-May 2021 from the Medical Monitoring Project, a complex, nationally representative sample of 3,692 people with HIV (PWH). Respondents reported SRH on a 5-point Likert type scale (poor to excellent), which the authors dichotomized into "good or better" and "poor or fair." Nationally, 72% of PWH reported "good or better" SRH. PWH with the following characteristics had a lower prevalence of "good or better" SRH, compared with those without: any missed HIV care appointment in the last 12 months, symptoms of moderate or severe depression and anxiety, unstable housing or homelessness, and hunger or food insecurity, as well as having a mean CD4 count <200 cells/mm3 versus CD4 >500 cells/mm3. Though SRH is a holistic measure reflective of HIV outcomes, integrated approaches addressing needs beyond physical health are necessary to improve SRH among PWH in the U.S. Modifiable factors like mental health, unstable housing or homelessness, and food insecurity warrant further study as potential high-yield targets for clinical and policy interventions to improve SRH among PWH. *The other authors are researchers from the Centers for Disease Control and Prevention.*

**Prevalence of Anal Cytology Screening Among Persons With HIV and Lack of Access to High-Resolution Anoscopy at HIV Care Facilities**

DLH researcher **Xin Yuan** was among the authors of an article published in the *Journal of the National Cancer Institute* (Online Ahead of Print: April 2024). Persons with HIV (PWH) at highest risk of anal cancer include gay, bisexual, and other men who have sex with men (GBMSM) and transgender women aged ≥35 years, and other PWH aged ≥45 years. Identifying and treating precancerous lesions can reduce anal cancer incidence in these groups. The authors assessed prevalence of anal cytology and access to high-resolution anoscopy (HRA) among PWH, overall and those at highest risk. Data were obtained from the CDC's Medical Monitoring Project (MMP), a population-based survey of PWH aged ≥18 years, and a supplemental MMP facility survey. The authors reported weighted percentages of PWH receiving anal cytology during the past 12 months, access to HRA, and characteristics of HIV care facilities by availability of HRA. Overall, 4.8% of PWH had anal cytology in the prior 12 months. Only 7.7% of GBMSM and transgender women aged ≥35 years, and 1.9% of all other PWH aged ≥45 years, had anal cytology. Prevalence was statistically significantly low among PWH with the following characteristics: non-Hispanic/Latino Black/African American, ≤ high school education, heterosexual orientation, and living in Southern MMP states. Among PWH, 32.8% had no HRA access on-site/through referral at their care facility; 22.2% had on-site access; 45.0% had HRA available through referral. Most facilities that received Ryan White HIV/AIDS Program funding, cared for >1000 PWH, or provided on-site colposcopy also provided HRA on-site/through referral. Anal cytology and access to HRA was low among PWH, including those at highest risk of anal cancer. The researchers' data may inform large-scale implementation of anal cancer prevention efforts. *The other authors are researchers from the Centers for Disease Control and Prevention.*

**High-Dose Isoniazid Lacks EARLY Bactericidal Activity Against Isoniazid-Resistant Tuberculosis Mediated by katG Mutations: A Randomized Phase II Clinical Trial**

DLH researcher **Laura Moran** was among the authors of an article published in the *American Journal of Respiratory and Critical Care Medicine* (Online Ahead of Print: April 2024; Print: August 2024). Observational studies suggest that high-dose isoniazid may be efficacious in treating multidrug-resistant tuberculosis (MDR-TB). However, its activity against Mycobacterium tuberculosis (M.tb) with katG mutations (which typically confer high-level resistance) is not established. The study objective was to characterize early bactericidal activity (EBA) of high-dose isoniazid in patients with tuberculosis caused by katG-mutated M.tb. A5312 was a Phase 2A randomized, open-label trial. Participants with tuberculosis caused by katG-mutated M.tb were randomized to receive 15 or 20 mg/kg isoniazid daily for 7 days. Daily sputum samples were collected for quantitative culture. Intensive PK sampling was performed on day 6. Data were pooled across all A5312 participants for analysis (drug-sensitive, inhA-mutated, and katG-mutated M.tb). Of 80 treated participants, 21 had katG-mutated M.tb. Isoniazid bacterial kill was described using an effect compartment and a sigmoidal Emax relationship. Isoniazid potency against katG-mutated M.tb was approximately 10-fold lower than against inhA-mutated M.tb. The highest dose (20 mg/kg) did not demonstrate measurable EBA, except in a subset of slow NAT2 acetylators (who experienced the highest concentrations). There were no Grade 3 or higher drug-related adverse events. This study found negligible bactericidal activity of high-dose isoniazid (15-20 mg/kg) in the majority of participants with tuberculosis caused by katG-mutated M.tb. *Other authors include researchers from the University of Cape Town, Johns Hopkins University, TASK Clinical Research Centre in Cape Town, and the Harvard T.H. Chan School of Public Health.*

**The Effect of Open-Label Semaglutide on Metabolic Dysfunction-Associated Steatotic Liver Disease in People With HIV**

DLH researcher **Christina Vernon** was among the authors of an article published in the *Annals of Internal Medicine* (Epub: April 2024; Print: June 2024). Metabolic dysfunction-associated steatotic liver disease (MASLD), defined as 1 or more major cardiovascular disease (CVD) risk factors and steatotic (fatty) liver disease (SLD), is a growing epidemic. Among people with HIV (PWH), MASLD prevalence is frequently higher and CVD risk is substantially greater than in persons without HIV. Because SLD is an independent CVD risk factor, reducing levels of intrahepatic triglycerides (IHTG, or liver fat) and associated insulin resistance or inflammation reduces CVD risk while preventing progressive liver disease. Semaglutide is a glucagon-like peptide-1 receptor agonist (GLP-1RA) that is approved by the US FDA for diabetes and weight loss and improves CVD risk and SLD in people with diabetes without HIV. The authors designed a pilot study of the effect of semaglutide on MRI-proton density fat fraction (MRI-PDFF)-quantified IHTG in PWH and MASLD. They hypothesized that semaglutide would reduce IHTG and improve cardiometabolic parameters. The SLIM-LIVER study (ACTG A5371; NCT04216589) was a phase 2b, single-group, open-label trial of semaglutide, 1 mg weekly, in PWH with central adiposity, insulin resistance or prediabetes, and SLD (defined as ≥5% of liver volume as IHTG). Eligible participants (enrolled between February 2021 and September 2022) were aged 18 or older and had suppressed HIV-1 RNA while using antiretroviral therapy; at least 5% IHTG by MRI-PDFF but no other SLD cause or significant alcohol consumption; no GLP-1RA use within 24 weeks; minimum waist circumference of at least 95 or 94 cm if assigned female at birth, respectively, and no diabetes diagnosis but had at least 1 of the following: fasting glucose level of 5.6 to 6.9 mmol/L (100 to 125 mg/dL), hemoglobin A1C level of 5.7% to 6.4%, or homeostatic model of insulin resistance (HOMA-IR) score above 3.0. Performance of MRI was standardized, with central reading done by one of the authors. Clinical laboratory tests were performed at local laboratories, and samples for insulin measurement (for HOMA-IR) were assayed together at the end of the study. Elevated alanine aminotransferase was defined as a level above 19 or 30 IU/L for persons assigned female or male at birth, respectively. Fifty participants provided greater than 90% power to detect an absolute change in IHTG of 5%. Per protocol analyses included participants receiving semaglutide within 4 weeks of their week 24 MRI and without prohibited medication use. The protocol for the SLIM-LIVER study is available at Annals.org. *The other authors include researchers from UTHealth Houston, Harvard T.H. Chan School of Public Health, Texas A&M University, and the National Institute of Allergy and Infectious Diseases.*

**Burden of Gallstone Disease in the United States Population: Prepandemic Rates and Trends**

DLH senior epidemiologist **Constance Ruhl** co-authored an article published in the *World Journal of Gastrointestinal Surgery* (Print: April 2024). Gallstone disease is one of the most common digestive disorders in the United States and leads to significant morbidity, mortality, and health care utilization. The authors aimed to expand on earlier findings and investigate prepandemic rates and trends in the gallstone disease burden in the United States using national survey and claims databases. The National Ambulatory Medical Care Survey, National Inpatient Sample, Nationwide Emergency Department Sample, Nationwide Ambulatory Surgery Sample, Vital Statistics of the United States, Optum Clinformatics® Data Mart, and Centers for Medicare and Medicaid Services Medicare 5% Sample and Medicaid files were used to estimate claims-based prevalence, medical care including cholecystectomy, and mortality with a primary or other gallstone diagnosis.

Gallstone disease prevalence was 0.70% among commercial insurance enrollees, 1.03% among Medicaid beneficiaries, and 2.09% among Medicare beneficiaries and rose over the previous decade. Recently, in the United States population, gallstone disease contributed to approximately 2.2 million ambulatory care visits, 1.2 million emergency department visits, 625,000 hospital discharges, and 2,000 deaths annually. Women had higher medical care rates with a gallstone disease diagnosis, but mortality rates were higher among men. Hispanics had higher ambulatory care visit and hospital discharge rates compared with Whites, but not mortality rates. Blacks had lower ambulatory care visit and mortality rates, but similar hospital discharge rates compared with whites. During the study period, ambulatory care and emergency department visit rates with a gallstone disease diagnosis rose, while hospital discharge and mortality rates declined. Among commercial insurance enrollees, rates were higher compared with national data for ambulatory care visits and hospitalizations, but lower for emergency department visits. Cholecystectomies performed in the United States included 605,000 ambulatory laparoscopic, 280,000 inpatient laparoscopic, and 49,000 inpatient open procedures annually. Among commercial insurance enrollees, rates were higher compared with national data for laparoscopic procedures. The gallstone disease burden in the United States is substantial and increasing, particularly among women, Hispanics, and older adults with laparoscopic cholecystectomy as the mainstay treatment. Current practice patterns should be monitored for better health care access. *The other author is a researcher from the National Institute of Diabetes and Digestive and Kidney Diseases.*

**Prevalence of Diagnosed and Undiagnosed Depression Among US Adults with Human Immunodeficiency Virus: Data from the Medical Monitoring Project**

DLH researcher **Xin Yuan** is among the authors of an article published in *AIDS Patient Care and STDs* (Online Ahead of Print: April 2024; Print: May 2024). People with human immunodeficiency virus (PWH) are disproportionately affected by depression, but the recent national estimates for US PWH encompassing both current symptoms and clinical diagnoses to assess missed diagnoses and lack of symptom remission are lacking. The authors used data from CDC's Medical Monitoring Project (MMP) to report nationally representative estimates of diagnosed and undiagnosed depression among US adult PWH. During June 2021 to May 2022, MMP collected interview data on symptoms consistent with major or other depression and depression diagnoses from medical records of 3928 PWH. Weighted percentages and prevalence ratios (PRs) were reported to quantify differences between groups on key social and health factors. Overall, 34% of PWH experienced any depression (diagnosis or Patient Health Questionnaire-8); of these, 26% had symptoms but no diagnosis (undiagnosed depression), 19% had both diagnosis and symptoms, and 55% had a diagnosis without symptoms. Among those with depression, persons with a disability and food insecurity were more likely to be undiagnosed. Unemployed persons, those experiencing a disability, food insecurity, or discrimination in human immunodeficiency virus (HIV) care were more likely to have diagnosed depression with symptoms. Those with symptoms (undiagnosed or diagnosed) were less likely to be antiretroviral therapy (ART) dose adherent or have sustained viral suppression and were more likely to have unmet needs for mental health services. One-third of PWH experienced depression, of whom nearly half were undiagnosed or still experiencing clinically relevant symptoms. Expanding screening and effective treatment for depression could improve quality of life and HIV outcomes. *The other authors include researchers from the Centers for Disease Control and Prevention and the Oak Ridge Institute for Science and Education (ORISE).*

**Food Security Status and Cardiometabolic Health by Sex/Gender and Race/Ethnicity Among Adults in the United States**

DLH researchers **Christopher Payne** and **W. Braxton Jackson II** were among the authors of an article published in *BMC Public Health* (Online: May 2024). Minoritized racial/ethnic groups and women in the United States (US) are disproportionately burdened by food insecurity, which likely contributes to disparities in cardiovascular health (CVH). Disparities are projected to widen due to the worsening climate crisis that is straining the agricultural system including food supplies. Nonetheless, studies have not investigated the relationship between food security status and "ideal" CVH in a large, nationally representative and racially/ethnically diverse US sample. The authors investigated household food security status in relation to "ideal" CVH among US adults (N = 157,001) using 2014-2018/2020 National Health Interview Survey data. Food security status was defined as very low, low, marginal, or high. Models were stratified by sex/gender and race/ethnicity. Very low food security prevalence was higher among non-Hispanic (NH)-Black (8.0%) compared to Hispanic/Latinx (5.1%), NH-White (3.1%) and NH-Asian (1.7%) adults. The association between very low versus high food security and modified "ideal" CVH (mICVH) was stronger among women than men. Compared to NH-White adults with high food security, racially/ethnically minoritized groups with very low to high food security were generally less likely to meet mICVH criteria. Food insecurity was associated with lower mICVH prevalence and racially/ethnically minoritized groups were disproportionately burdened. *The other authors include researchers from the National Institute of Environmental Health Sciences and the National Institute on Minority Health and Health Disparities.*

**Effectiveness of Double-Dose Dolutegravir in People Receiving Rifampin-Based Tuberculosis Treatment: An Observational, Cohort Study of People With HIV From Six Countries**

DLH researcher **Elizabeth Woolley** was among the authors of an article published in *Clinical Infectious Diseases* (Online Ahead of Print: May 2024). Tenofovir-lamivudine-dolutegravir (TLD) is the preferred first-line antiretroviral therapy (ART) regimen. An additional 50 mg dose of dolutegravir (TLD + 50) is required with rifampin-containing tuberculosis (TB) co-treatment. There are limited data on the effectiveness of TLD + 50 in individuals with TB/HIV. This was a prospective, observational cohort study at 12 sites in Haiti, Kenya, Malawi, South Africa, Uganda, and Zimbabwe. Participants starting TLD and rifampin-containing TB treatment were eligible. Primary outcome was HIV-1 RNA ≤1000 copies/mL at end of TB treatment. The authors enrolled 91 participants with TB/HIV: 75 ART-naïve participants starting TLD after a median 15 days on TB treatment, 10 ART-naïve participants starting TLD and TB treatment, 5 starting TB treatment after a median 3.3 years on TLD, and 1 starting TB treatment and TLD after changing from efavirenz/lamivudine/tenofovir. Median age was 37 years, 35% female, median CD4 count 120 cells/mm3, 87% had HIV-1 RNA >1000 copies/mL. Two participants died during TB treatment. Among 89 surviving participants, 80 were followed to TB treatment completion, including 7 who had no HIV-1 RNA result due to missed visits. Primary virologic outcome was assessed in 73 participants, of whom 69 had HIV-1 RNA ≤1000 copies/mL. No dolutegravir resistance mutations were detected among four participants with HIV-1 RNA >1000 copies/mL. In routine programmatic settings, concurrent rifampin-containing TB treatment and TLD + 50 was feasible, well-tolerated, and achieved high rates of viral suppression in a cohort of predominantly ART-naïve people with TB/HIV. *The other authors include researchers from Emory University, Johns Hopkins University School of Medicine, Harvard T.H. Chan School of Public Health, and research institutes in Uganda, South Africa, Kenya, Malawi, Haiti, and Zimbabwe.*

**Intimate Care Products and Incidence of Hormone-Related Cancers: A Quantitative Bias Analysis**

DLH researcher **Aimee D'Aloisio** was among the authors of an article published in the *Journal of Clinical Oncology* (Online Ahead of Print: May 2024; Print: August 2024). Intimate care products may contain substances associated with increased risk of hormone-related cancers. The relationship between genital talc use and ovarian cancer, in particular, has been well studied, but concerns about recall bias and exposure misclassification have precluded conclusions. The authors examined the association between intimate care products and female hormone-related cancers, accounting for potential biases, using data from a US-based cohort study. The Sister Study enrolled 50,884 women who had a sister with breast cancer. Data on genital talc use and douching were collected at enrollment (2003-2009) and follow-up (2017-2019). Cox proportional hazards models were used to estimate hazard ratios (HRs) for associations between intimate care product use and breast, ovarian, and uterine cancers. Across considered scenarios, 41%-64% of participants douched and 35%-56% used genital talc. In models adjusted for exposure misclassification, genital talc use was positively associated with ovarian cancer. Frequent douching and douching during young adulthood were positively associated with ovarian cancer, but neither douching nor talc was associated with breast or uterine cancer. Differential reporting of talc use by cases and noncases likely produces positive biases, but correcting for error still resulted in HRs above 1.0. Although results show how differential recall would upwardly bias estimates, corrected results support a positive association between use of intimate care products, including genital talc, and ovarian cancer. *The other authors include researchers from the National Institute of Environmental Health Sciences, the National Cancer Institute, and the University of North Carolina Gillings School of Global Public Health.*

**Frequency of Personal Care Product Use Among Reproductive-Aged Black Individuals and Associations With Socio-Demographic Characteristics**

DLH researcher **Caroll Co** was among the authors of an article published in the *Journal of Exposure Science & Environmental Epidemiology* (Online Ahead of Print: May 2024; Print: July 2024). Compared to White women, Black women in the United States are more likely to use personal care products (PCPs) with higher concentrations of endocrine-disrupting chemicals (EDCs) and harsher chemical formulations. This may contribute to differential health outcomes in Black women such as increased risk of breast cancer, cardiometabolic outcomes, adverse birth outcomes, and uterine fibroids. The objective was to classify distinct PCP use patterns across multiple types of products and examine how patterns vary by socio-demographic characteristics. The Study of Environment, Lifestyle and Fibroids is a cohort study of reproductive-aged Black individuals living around Detroit, Michigan. Using self-reported data on frequency of PCP collected between 2013-2018, the authors employed latent class analysis to identify distinct groups of participants with similar PCP use. Socio-demographic characteristics were compared across latent classes. Among 1562 participants, 6 latent classes were identified: Lower Overall; Higher Nailcare; Higher Skincare; Moderate Overall; Higher Makeup/Haircare/Skincare; Higher Overall. Makeup and nailcare usage were the most predictive for classifying participants into groups. Participants in classes with less frequent use of all PCPs and those with only high use of nailcare products were more likely to report lower socio-economic status (SES), be current smokers, have a body mass index of ≥35 kg/m2, and have ≥3 births. In comparison, participants in classes with average and more frequent use of PCPs were more likely to report higher SES, be non-smokers, be nulliparous, and have ever used oral contraceptives. This study is one of the first detailed assessments of PCP usage among a large cohort of

young adult Black women that considers multiple product categories including makeup, hair, skin, nail, and vaginal products. Latent class analysis was used to capture complex patterns of PCP use and identify distinct groups of individuals with similar product use. Although the latent classes are specific to this study population, the identified socio-demographic characteristics or behaviors associated with latent classes may inform targeted and impactful exposure reduction strategies in similar populations. *The other authors include researchers from the National Institute of Environmental Health Sciences and the National Institute on Minority Health and Health Disparities.*

**Obesity Management for the Treatment of Type 2 Diabetes**

DLH senior epidemiologist and researcher **Sarah Casagrande** served as an editor for an article published in *Diabetes in America*, a National Institute of Diabetes and Digestive and Kidney Diseases compilation and assessment of epidemiologic, public health, clinical research, and clinical trial data focused on diabetes, its complications and treatment, health care utilization, and diabetes prevention in the United States. (Online: May 2024). Excerpt: Interventions to address obesity are recommended as treatments for type 2 diabetes. In this article, nationally representative data are used to describe behavioral, pharmacologic, and surgical interventions employed by adults with diabetes for obesity treatment. Literature focused on youth with type 2 diabetes is also reviewed. Data from the National Health and Nutrition Examination Survey (NHANES) 2015–2018 showed that only 2.3% of U.S. adults with diagnosed diabetes had Healthy Eating Index (HEI) scores ≥80 indicating a "good" diet, while 44.6% had HEI scores <50 indicating a "poor" diet. Data from the NHANES 2015–2020 showed that only 47.0% of U.S. adults with diabetes reported meeting physical activity standards, 15.6% achieved less than the recommended amount of physical activity, and 37.4% reported no physical activity. Between 2015 and 2020, NHANES data showed that 36.7% of U.S. adults with diagnosed diabetes reported attempting to lose weight in the past year. In order of decreasing frequency, the following weight reduction strategies supported by scientific evidence were reported: eating less, eating healthier, exercising, eating special diets, joining weight loss programs, taking prescription medications, and undergoing weight loss surgery. The American Diabetes Association recommends that providers and patients consider the impact of antihyperglycemic medications on weight. Data from the NHANES 2015–2020 showed that metformin, which is associated with modest weight loss, was the most frequently prescribed antihyperglycemic agent. Sulfonylureas and insulins, which are associated with weight gain, were the next most frequently prescribed classes of antihyperglycemic medications. The frequency of prescribing glucagon-like peptide-1 (GLP-1) receptor agonists (RAs), which are associated with weight loss, was 5.0%. Rates of GLP-1 RA use among commercially insured adult patients with type 2 diabetes increased substantially between 2015 and 2019 and have increased more in recent years but remain lower among Asian, Black, and Hispanic patients, those with lower incomes, and among adult patients with atherosclerotic cardiovascular disease, who are known to benefit from this class of medications. Data from the Healthcare Cost and Utilization Project 2019 showed that metabolic (bariatric) surgery was infrequently performed as an inpatient or outpatient procedure among U.S. adults with diagnosed type 2 diabetes despite an increase in the total number of metabolic surgery procedures performed between 2015 and 2019. The American Diabetes Association recommends considering metabolic surgery for adolescents with type 2 diabetes and body mass index (BMI) ≥35 kg/m2. Anti-obesity medications appear to be effective but require further study in youth.

**Progress Towards Achieving National Goals for Improved Quality of Life Among Cis-Gender Black Women With HIV**
DLH researcher **Xin Yuan** was among the authors of an article published in *AIDS (London, England)* (Epub: May 2024; Print: June 2024). Data from the CDC's Medical Monitoring Project indicate that the United States is on track to meet one of five National HIV/AIDS Strategy (NHAS) Quality of Life goals among cisgender Black women, specifically, hunger/food insecurity. Substantial work needs to be done to improve self-rated health and to decrease unmet need for mental health services. Enhanced and coordinated action are necessary to reach all Quality of Life goals in this NHAS priority population. *The other authors are researchers from the Division of HIV Prevention at the Centers for Disease Control and Prevention.*

**Associations of a Toenail Metal Mixture With Attention and Memory in the Gulf Long-Term Follow-up (GuLF) Study**
DLH researcher **W. Braxton Jackson II** was among the authors of an article published in *The Science of the Total Environment* (Epub May 2024; Print: July 2024). Research on metal-associated neurodegeneration has largely focused on single metals. Since metal exposures typically co-occur as combinations of both toxic and essential elements, a mixtures framework is important for identifying risk and protective factors. This study examined associations between toenail levels of an eight-metal mixture and attention and memory in men living in US Gulf states. The authors measured toenail concentrations of toxic (arsenic, chromium, lead, and mercury) and essential (copper, manganese, selenium, and zinc) metals in 413 non-smoking men (23-69 years, 46% Black) from the Gulf Long-Term Follow-Up (GuLF) Study. Sustained attention and working memory were assessed at the time of toenail sample collection using the continuous performance test (CPT) and digit span test (DST), respectively. Attention deficits were greater among Black participants compared to White participants for the same increase in toenail chromium concentrations. The authors' findings support existing studies of manganese-related memory deficits and are some of the first to show chromium related attention deficits in adults. Longitudinal study of cognitive decline is needed to verify chromium findings. Research into social and chemical co-exposures is also needed to explain racial differences in metal-associated neurobehavioral deficits observed in this study. *The other authors include researchers from the Johns Hopkins Bloomberg School of Public Health, The George Washington University Milken Institute School of Public Health, and the National Institute of Environmental Health Sciences.*

**Unmet Needs for Ancillary Services by Provider Type Among People With Diagnosed Human Immunodeficiency Virus**
DLH researcher **Xin Yuan** was among the authors of an article published in *Open Forum Infectious Diseases* (Online: May 2024; eCollection: July 2024). Unmet needs for ancillary services are substantial among people with human immunodeficiency virus (PWH), and provider type could influence the prevalence of unmet needs for these services. Data from a national probability sample of PWH were analyzed from the Centers for Disease Control and Prevention's Medical Monitoring Project. The authors analyzed 2019 data on people who had ≥1 encounter with a human immunodeficiency virus (HIV) care provider (N = 3413) and their care facilities. The authors assessed the proportion of needs that were unmet for individual ancillary services, overall and by HIV care provider type, including infectious disease (ID) physicians, non-ID physicians, nurse practitioners, and physician assistants. An estimated 98.2% of patients reported ≥1 need for an ancillary service, and of those 46% had ≥1 unmet need. Compared with patients of ID physicians, needs for many

ancillary services were higher among patients of other provider types. However, even after adjustment, patients of non-ID physicians had lower unmet needs for dental care, and patients of nurse practitioners had lower unmet needs for HIV case management services, compared with patients of ID physicians. Although needs were greater among patients of providers other than ID physicians, many of these needs may be met by existing support systems at HIV care facilities. However, additional resources may be needed to address unmet needs for dental care and HIV case management among patients of ID physicians. *The other authors are researchers from the University of Maryland School of Medicine and the Centers for Disease Control and Prevention.*

**Prevention of Type 1 Diabetes**
DLH senior epidemiologist and researcher **Sarah Casagrande** served as an editor for an article published in *Diabetes in America*, a National Institute of Diabetes and Digestive and Kidney Diseases compilation and assessment of epidemiologic, public health, clinical research, and clinical trial data focused on diabetes, its complications and treatment, health care utilization, and diabetes prevention in the United States. (Online: June 2024). Excerpt: Type 1 diabetes results from autoimmune destruction of insulin-producing beta cells. There is a genetic predisposition to the disease, with the greatest contribution conferred by alleles present within the major histocompatibility complex (MHC; known as the human leukocyte antigen [HLA] region) on the short arm of chromosome 6. Whether the initiation of this immune response results from environmental triggers remains to be determined. Over years, immune infiltration into pancreatic islets leads to beta cell damage, impairment of cell function, and destruction of beta cells. This notion has led to clinical trials to arrest the progression of disease and potentially prevent or reverse the clinical syndrome. Clinical trials using various immunologic agents have been conducted at multiple stages of the disease process. Primary prevention trials have been conducted in individuals with genetic predisposition who have not yet developed immunologic markers. Secondary prevention trials have been conducted in individuals with two or more type 1 diabetes-related autoantibodies, either during Stage 1 (normal metabolic function) or Stage 2 (abnormal metabolic function). Intervention trials, also referred to as tertiary prevention trials, have been conducted after diagnosis of hyperglycemia (Stage 3), mostly shortly after clinical onset of disease. This article provides brief summaries of randomized controlled clinical trials that have been performed and mentions some nonrandomized pilot studies. Success has been limited in primary and secondary prevention trials, with one recent and notable exception (teplizumab). Some tertiary intervention trials have demonstrated improved beta cell function, but these studies have not permanently prevented the decline in beta cell function (eventually declining in parallel to controls). Future interventions with combinations of agents that can target multiple immunologic mechanisms may be needed, including strategies to improve regulatory immunity, as well as to replace and restore beta cell function.

**Association Between Solar Radiation and Mood Disorders Among Gulf Coast Residents**
DLH researchers **Ian Buller** and **W. Braxton Jackson II** were among the authors of an article published in the *Journal of Exposure Science & Environmental Epidemiology* (Online Ahead of Print: June 2024). Climate factors such as solar radiation could contribute to mood disorders, but evidence of associations between exposure to solar radiation and mood disorders is mixed and varies by region. The authors' objective was to evaluate the association of solar radiation with depression and distress among residents living in U.S. Gulf states. They enrolled home-visit participants in the Gulf Long-Term Follow-up Study who completed validated screening questionnaires for depression (Patient Health Questionnaire-9, N = 10,217) and distress (Kessler Psychological Distress

Questionnaire, N = 8,765) for the previous 2 weeks. Solar radiation estimates from the Oakridge National Laboratory Daymet database (1-km grid) were linked to residential addresses. Average solar radiation exposures in the seven (SRAD7), 14 (SRAD14), and 30 days (SRAD30) before the home visit were calculated and categorized into quartiles (Q1-Q4) within adjusted generalized linear mixed models. Higher levels of SRAD7 were non-monotonically inversely associated with depression and distress. Elevated SRAD14 and SRAD30 appeared to be associated with decreasing prevalence ratios (PRs) of distress. Associations with SRAD7 varied somewhat, though not significantly, by season, with increasing PRs of distress in spring and summer and decreasing PRs of depression and distress in fall. Previous research suffered from exposure misclassification, which impacts the validity of their conclusions. By leveraging high-resolution datasets and Gulf Long-term Follow-up Cohort, the authors' findings support an association between increased solar radiation and fewer symptoms of mood disorders. *The other authors are researchers from the National Institute of Environmental Health Sciences and the National Institute on Aging.*

**Prevalence, Patterns, and Determinants of Breastfeeding Cessation Among Mothers of Children Under 24 Months in Uganda**

DLH researchers **Florence Nakaggwa**, **Derrick Kimuli**, **Norah Namuwenge**, **Rebecca Nsubuga**, **Hellen Nayebare**, **Louis Kaboine**, **Immaculate Baseka**, **Kenneth Kasule**, **Barbara Amuron**, and **Daraus Bukenya** were among the authors of an article published in *BMC Public Health* (Print: June 2024). Breastfeeding duration is a critical component of infant and child nutrition, providing immediate and long-term benefits to both children and their mothers. This study used data from the lot quality assurance sampling (LQAS) survey to examine the prevalence, patterns, and determinants of breastfeeding cessation in Uganda. The study was a secondary analysis of data collected by the cross-sectional LQAS surveys in 2021 and 2022 covering 77 districts in Uganda. Overall, 26,377 records of mothers with children under 24 months old were analyzed. The mothers' mean age was 27.9 years while that of their children was 11.0 months. Overall, the breastfeeding cessation rate was 17.7%. However, cessation was highest (49.7%) among mothers of children 18-23 months. Factors associated with increased odds of breastfeeding cessation included older child's age, older mother's age, using modern family planning, being pregnant and having an unknown pregnancy status. Lower odds of breastfeeding cessation were observed among mothers who were married, lived in larger households, lived in rural residences, whose children received vitamin A supplementation, and among all other regions compared to Kampala. One in five mothers ceased breastfeeding before their child reached 2 years, with a significant increase in cessation odds among mothers of older children. These findings underscore the importance of interventions to promote breastfeeding continuation and adequate nutrition for non-breastfed infants, particularly in regions with high cessation rates. *Other authors include researchers from the United States Agency for International Development (USAID) Strategic Information Technical Support (SITES) Activity and the US Agency for International Development Uganda.*

**Inter-Rater and Intra-Rater Agreement in Scoring Severity of Rodent Cardiomyopathy and Relation to Artificial Intelligence-Based Scoring**

DLH researchers **Caroll Co**, **Shawn Harris**, and **Sandra McBride** were among the authors of an article published in *Toxicologic Pathology* (Online Ahead of Print: June 2024). The authors previously developed a computer-assisted image analysis algorithm to detect and quantify the microscopic features of rodent progressive cardiomyopathy (PCM) in rat heart histologic sections, and validated the results with a panel of five veterinary

toxicologic pathologists using a multinomial logistic model. In this study, the authors assessed both the inter-rater and intra-rater agreement of the pathologists and compared pathologists' ratings to the artificial intelligence (AI)-predicted scores. Pathologists and the AI algorithm were presented with 500 slides of rodent heart. They quantified the amount of cardiomyopathy in each slide. A total of 200 of these slides were novel to this study, whereas 100 slides were intentionally selected for repetition from the previous study. After a washout period of more than 6 months, the repeated slides were examined to assess intra-rater agreement among pathologists. Intra-rater variability is not a concern for the deterministic AI. The inter-rater agreement across pathologists was moderate. These results demonstrate the utility of AI algorithms as a tool for pathologists to increase sensitivity and specificity for the histopathologic assessment of the heart in toxicology studies. *Other authors include researchers from the National Institute of Environmental Health Sciences.*

**Disparities in Sleep Duration and Quality by Industry of Employment and Occupational Class Among Native Hawaiian/Pacific Islanders and Non-Hispanic Whites in the United States**

DLH researcher **John McGrath** was among the authors of an article published in *Sleep Health* (Online Ahead of Print: June 2024; Print: August 2024). The authors' objective was to investigate disparities in the work-sleep relationship between Native Hawaiian/Pacific Islanders (NHPIs) and non-Hispanic (NH)-White populations. Using data from a nationally representative sample of U.S. adults (n = 20,828) in the 2014 National Health Interview Survey, Prevalence of short sleep duration (<7 hours) was estimated among NHPIs (10%) and NH-Whites for each of 7 employment industry categories and 3 occupational classes. Mean age was 41 ±0.5 years for NHPIs and 49 ±0.2 years for NH-Whites. Women comprised 52% of both groups. NHPIs were more likely than NH-Whites to report short sleep duration across all industry of employment categories (except for food and accommodation services) and occupational classes. The disparity was widest among NHPI and NH-White workers in the "professional/management" industry category, with NHPIs having higher prevalence of very short (<6 hours) and short sleep durations and lower prevalence of recommended sleep duration and waking up feeling rested. Among the occupational classes, the NHPI-White disparity was widest among participants who held support service occupations. Although professionals had the lowest and laborers had the highest prevalence of short sleep among the three occupational classes in both NHPI and NH-White groups, short sleep duration prevalence was higher among NHPI professionals (35%) than NH-White laborers (33%). NH-White workers across industry and occupational classes had higher sleep medication use prevalence compared to NHPI workers. The authors concluded that the work environment via occupation type may contribute to racial/ethnic disparities in short sleep. Further investigations are warranted. *The other authors are researchers from the National Institute on Aging, University of Hawai'i West O'ahu, Johns Hopkins Bloomberg School of Public Health, and the National Institute of Environmental Health Sciences.*